Book of Abstracts
ARTEM OCC 2020 Edition

Creativity, Innovation and Sustainability in the Age of Disruptions: Dealing with Global Challenges through Trans- and Interdisciplinary Approaches

Edited by Stefan Hüsig

Creativity, innovation and sustainability are nowadays considered vital indicators of societal and professional life, yet their advances are typically considered separately. In the Anthropocene era, we face a fundamental imbalance between social and economic activities as well as earth systems. This has spawned various challenges in the fabric of human civilization in multiple subsystems of society such as transitions in energy, monetary and transport systems, deglobalization, and digitalization as well as environmental degradation, and social, financial and economic instability. Organizations need creative approaches to identifying innovative solutions for realizing the UN sustainable development goals. To navigate through an uncertain era of ferment in many industries and radically innovate, it is of paramount importance to dissolve disciplinary and functional boundaries, connect formerly unconnected knowledge and applications fields, foster systemic thinking, overcome thought barriers, and break existing paradigms.

New combinations frequently emerge when crossing cultural and geographic borders that enable further learning on various levels of society, and offer improvements in sustainable local development. The appetite for fresh alternatives to overcome the apparently dysfunctional legacy subsystems of society seems more pressing in the global zeitgeist than decades before. This growing uncertainty also produces resistance, anxiety and turmoil in and between societies. Potentially disruptive innovations and business models and new institutional technologies such as decentralized blockchain-based sharing and crowd controlled economic platforms emerge, but it seems that there is a lack of a common orientation and visionary leadership connecting all these trends towards sustainable development.

The artisans of our civilization such as managers, engineers or artists, provided with a global awareness of the diverse regional and context specific complexities and equipped with trans-

and interdisciplinary approaches towards creative and sustainable development might be able to develop a joint vision to address these global challenges.

In 3rd ARTEM OCC conference 2020 at the Chemnitz University of Technology in Chemnitz, Germany we aim to bring various scholars and stakeholders together to discuss and explore research that offers new insights into creative and systemic approaches and innovation processes that cross cultural and disciplinary borders - especially between art, management and technology - for a sustainable impact on society.

The general intention of the conference was to provide inter- and transdisciplinary encounters among participants. In addition to traditional paper presentations, contributions are welcome on discussion forums, case studies, artistic and playful interventions or practical demonstrations.

SUB-THEMES & TRACKS

1. Open track: Art, Creativity & Disruptive Innovation for Sustainability in Entrepreneurship and Established Organizations
2. Understanding and Fostering Imagination for Responsible Innovation. Foresight, Fiction, Ideas and Narratives and Their Influence, Exploitation and Potential.
3. Future Cities: Alternative Governance and Innovative Technologies for Sustainable and Smart Cities
4. The Art of Changing Habits: Aesthetic Research to Ecologize our Lifestyles
5. Sustainability Multidisciplinary
    a. Sustainability: Systems Thinking and Progress to Sustainability

b. Creativity and Innovation in Social Marketing for Sustainable Behaviour Change
c. Arts & Science for Sustainable Development Goals (SDGs)

6. Engineering, Technology, Supply Chain and Knowledge Management in the Era of Digitalization
7. Humanistic Management
8. From Ego to Eco: Unlearning Social Entrepreneurship in the 4th Industrial Revolution

Conference Date: 19 -21.03.2020

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WHAT IS ARTEM OCC?

ARTEM OCC is ARTEM International Organizational Creativity and Sustainability Conference. It was founded by ICN Business School in 2015 as part of its mission to continuously develop impactful research, enhance its societal responsibility, consolidate its close relationship with the business world and reinforce its international stand.

ARTEM OCC is a unique academic conference of its kind, inspired by the philosophy of the ARTEM alliance, which is part of a transversal and transdisciplinary reflection on scientific research and learning. It aims at creating a discursive space among academics and practitioners in areas such as engineering, arts, sociology, education and management to address from inter- and transdisciplinary views the relation between creativity and sustainability.

The founders of ARTEM OCC: Kamel Mnisri, Klaus-Peter Schulz, Nuno Guimaraes Da Costa & Paul Shrivastava

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1. Open track: Art, Creativity & Disruptive Innovation for Sustainability in Entrepreneurship and Established Organizations

Entrepreneurship self-efficacy: a sustainable drive for new venture creation in developing country (An entrepreneurship student perspectives)

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Globally, education is considered the bedrock of human capital and skill development. The emergence of the fourth industrial revolution presumed to be disrupting the existing work creates unemployment and increased employee's turnover. The extent of this disruption remained an ongoing discourse among the scholars and practitioners of entrepreneurship alike. However, while it is indubitably, the verity that the emergency of fourth industrial revolution and artificial intelligence has continued to modify the work structure, the effect has caused rise in the global unemployment, decrease in new business start-up, failure on venture sustainability; and entrepreneurial ecosystem has been overtaking largely by volume of services industries than production and manufacturing industries. Entrepreneurship development in higher education supposed to be a solution to the challenges, however, there are salient factors in the education system that affects the development of entrepreneurship within the African continent. For instance, empirical evidence revealed that the lack of entrepreneurial action amongst the university undergraduate and postgraduates during and after their studies is a major factor that mitigates against the development of entrepreneurship as a result of outdated learning curriculum, lecturers incompetency in the discipline affects the teaching methods and student's entrepreneurial self-efficacy; and low total entrepreneurial activities in South Africa. Different training and development programmes in South African higher institutions seldomly translated into entrepreneurial action from the student, resulting in low entrepreneurship activities, job insecurity, unemployment and youth unrest tagged "Afrophobia attack". South African education and training system produce graduates and youths who are not work-ready and lack the capacity to start a business (Herrington & Kew, 2016). The fact that South African Universities focused on theoretical teaching rather than the practical aspects of teaching and learning prevents the realisation of student' hope of becoming a current or future entrepreneur.

Base on the foregoing, the thrust of this study is to harness student potential as the student has shown an aptitude for experiential pedagogical intervention through active learning, workshop, seminars and practicals that stimulate entrepreneurship drive especially among the student with a high propensity for risk-taking and strong locus of control that positively affect entrepreneurship ecosystem. This eventually informed debate by the practitioners and scholars on the establishment of entrepreneurship universities to grow the economy and produce graduates that are

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work-ready, invariably providing required intellectuals and skills (Human capital) for fourth industrial revolution jobs. Then guaranteed envisaged economic and entrepreneurship ecosystem growth through the Small Medium Enterprises that will positively provide jobs for the teeming youth and graduate who pitch their career both in intrapreneurship and entrepreneurially which will enable proper plan for the expected future.

The study adopted a quantitative design method as a suitable tool in providing a relative explanation of the phenomenon understudy in a longitudinal intensive systemic action learning action research training that observed behavioural changes on the student participant. Theory U was employed as a social transformative framework to activate and enhanced student entrepreneurial self-efficacy in relation to the set objective; "to determine the variation in student Entrepreneurship self-efficacy, before, during and after intensive action learning". The survey design was used to measure behavioural change at the three stages of the training to collect and analyse data, this combines the mix of experimental and survey designs to harness and enhance the application of theory U features on students' entrepreneurial future. A structured questionnaire was self-administered to collect data and vigorously investigate behavioural changes of entrepreneurial self-efficacy construct on the participant of the four months entrepreneurship intensive training. The convenience sampling method of nonprobability was employed to consciously recruit and identified two hundred and thirty (230) population of the self-volunteered student who participated in the study. The choice of the University registered undergraduate and post-graduate student was to engage those who have prior theoretical knowledge of entrepreneurship in traditional learning method, willing to develop themselves in entrepreneurship line and venture creation; and practitioners like lecturer in the field were not prone to provide salient information on the menace of unemployment and how it hindered graduate entrepreneurial development.

Data were cleaned, arranged and grouped to improve a good understanding of the researcher about the study, this is to make acceptable submission providing an answer to the questions in the study. Descriptive statistics was employed for the section A for frequency counts, simple percentages, mean and standard deviation, these are presented in tables, while section B was analysed using inferential statistics to convert the data to numeric format, IBM SPSS version 25 package was adopted being a suitable analysing tool in social sciences, health and education research. A non-parametric test was used because the data were not normally distributed with categorical data and reliability test was employed to confirm the data internal consistency on the survey instrument. Cronbach's alpha was above the acceptable threshold of 0.7. Factor analysis was carried out to measure the instrument construct validity and the instrument was subjected to pre-test and pilot testing. The result cannot be generalised beyond the specific research context because non-probability techniques were employed.

The empirical findings revealed that entrepreneurship self-efficacy varies significantly during the intensive action learning action research training at the three stages of the training indicated that the training was effectively design and delivered, it shows that traditional learning is essential but to harness the youth and student potential entrepreneurially creating venture and sustain it, action learning (experiential learning) is key and to provide the required fourth industrial revolution skills for future job and work readiness, there must be a paradigm change in curriculum to impact innovative and creative skill for business stability. It was concluded that using theory U framework has significantly influence entrepreneurial self-efficacy on student entrepreneurship actions and shows a positive relationship between traditional classroom teaching (Theory) and experiential learning.

The study focused was the university environment, therefore, it is recommended that future research be extended to the various higher institution and other provinces in the country and other developing African countries. Entrepreneurship training for innovation and creativity, en-

trepreneurship universities, entrepreneurship lecturer re-training and curriculum overhauling is recommended.

Keywords: Entrepreneurship self, efficacy, traditional learning, action learnin, training, theory U, unemployment.

The Impact of Arts and Design on Applied Scientific Research

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What is the problem?

Arts and design can be supportive to business and science. This is mainly because companies and research institutes can strengthen their unique position and competitiveness through art and design-based approaches. A review of the literature shows, however, that research, so far, has mainly dealt with the impact of arts and design on business. Arts and design can support companies to achieve their change management objectives or to make workplaces more appealing to employees, so that they feel better and become more productive. Moreover, art and design-based initiatives can improve the interrelationships between employees inside the organization, e.g. by leveraging methods borrowed from theatre to strengthen the cooperation between corporate divisions. Therefore, fields such as business aesthetics have emerged for the study of the relationships between business, arts and design. In addition, there is a fair body of research that aims at monetizing the impact of arts. Very often, policy makers need cost and benefit calculations to justify their investments in cultural and art institutions. However, the methods used in this regard are usually subject to criticism due to the difficulty of estimating the return on investment. For example, cultural and art institutions improve the attractiveness of cities, and the difficulty lies in how to isolate the contribution of an investment in one cultural or art institution to city attractiveness. In this research, we tackle a very specific problem: the impact of arts and design on applied research, drawing, in particular, on the context of the Fraunhofer Society, the leading applied research institution in Europe.

Why is it important?

If we can detect a positive impact of arts and design on applied research, then it would be very advantageous to incorporate them more systematically into research projects. Many research and innovation programs such as the STARTS (Science, Technology & Arts)-initiative launched by the European Commission have already started to promote the collaboration of science, art and design to improve project outcomes especially in terms of creativity and sustainability.

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Therefore, it is important to deal with two questions:

- What are the specific forms of collaboration between science, arts and design? And
- How can the impact of arts and design on applied research be measured?

What did you do?

Our research design is exploratory and conceptual in nature. The reason why we use this type of research design is that there is no substantial prior research on how arts and design affect applied science. Our research goes in three steps.

The first step is aimed at reviewing the research literature. As published material on the impacts of arts and design on science is scarce, we searched general business literature that deals with the effects of arts and design (e.g. Romanowska et al. 2013, Zsolnai & Wilson 2016). The findings from the literature analysis have been structured and integrated in a framework that incorporates all identified possible effects of arts and design.

Second, we conducted a qualitative interview study with Fraunhofer researchers that worked on research projects that involve arts and design activities. In this regard, we established a list of 38 scientific projects with corresponding contact persons by using the Internet and Fraunhofer Intranet. Then, we contacted the researchers in our list. Because of availability constraints or other issues (e.g. when the person(s) that conducted the project left the organization), not all identified researchers could participate in the interview study. We ended up by interviewing 10 scientists. All interviews have been transcribed and then analyzed by means of qualitative content analysis to generate a list of effects of arts and design on science. This list was compared to the list of impacts derived from the literature review.

The third step of the research is the conceptual part. It relies, in part, on the results of the literature review and the interviews. This step led to the development of a system of qualitative and quantitative metrics that capture the effects of arts and design on applied science. By drawing on three use cases, which are scientific projects incorporating arts and design activities, we carry out a first preliminary, but rather qualitative validation of the developed metrics. Note that these projects have not been considered in the exploratory interview study. The main objective of the use cases is to examine the extent to which the application of these metrics make sense in the context of the projects.

What did you find?

With respect to our research question, we found three basic forms of collaboration between science, arts, and design:

- Arts and design supporting the process of research and innovation: e.g. arts and design creating new perspectives for a scientific problem and generating a broader view than only technological advancements such as the incorporation of sustainability issues in technological developments.
- Arts and design supporting the outcome of the research process: e.g. by integrating design elements into software development to make the software more user-friendly (improvement

of the usability level of software products coming out of the research process); or arts objects illustrating the functioning of a technology in a simple way, so that the technology is accessible to the laymen, thus facilitating cross-disciplinary use of new technology.

- Research organizations cooperating with arts and design institutions to release and conduct first experiments with a newly developed technology, in other words museums or city orchestra of classic music as a testbed for new technologies at the prototype phase.

With respect to the second research question, we detected a plethora of impacts and key metrics that measure the impact of arts and design on applied science. Note, however, that we consider both direct and indirect effects of the collaboration of science and arts and design. For instance, the incorporation of arts and design activities can lead to image and reputation improvement of the research institute, leading to more research funds and research contracts. These are indirect effects. An art object, however, can support a sales meeting (e.g. researcher selling her research to a company), leading to direct quantifiable effects.

A comparison of the results from the literature and those from the interviews show that many effects of arts and design that have been identified in the scientific literature are also relevant in the context of applied sciences. Depending on the form and intensity of art and design-based interventions and the institutions environment and experiences, the effects of art and design can arise at internal and external levels: organization, employees, output, customers and organizational performance. The set of quantitative indicators captures the impacts of art and design on e.g. the institutional identity, employer branding, or the institution's reputation. Qualitative indicators capture effects such as a change in employee competencies, innovative capability or aesthetics, and usability of research output.

The qualitative application of the metrics system to the use cases (one to two qualitative interviews were conducted for each use case) illustrates that a large part of the indicators are applicable and relevant. Additionally, the integration of arts and design into scientific project work had several positive effects.

What do you recommend?

In conclusion, the study demonstrates that art and design can support research processes, outputs and early application of new technologies (Tech transfer), e.g. when research organizations cooperate with cultural or arts institutions. The indicator system that we developed captures the benefits of arts and design. Consequently, we recommend that researchers in applied sciences consider the possibility of integrating arts and design elements into their projects and evaluate their potential to support the research. We developed a checklist with 27 questions that researchers can go through in order to assess whether arts and design can be supportive to their research endeavors.

Future studies should focus on expanding and validating the initial indicator system. The integration of the metrics into the ERP system of the research organization can also help the organization to generate a continuous capture of the effects of arts and design on science. For example, the information system can evaluate whether research proposals with arts and design activities are more likely to get funds, or it can assess the probability that such projects lead to follow up projects. Only in this way, actually, evidence can be generated on the real positive effects of arts and design. Finally, in the future, we intend building a scoring model that captures the arts and design endeavors of research institutions in the past. By regressing the performance of research organizations (e.g. level of external funding) on this score, we can determine

the extent to which arts and design activities explain the performance of these institutes. By complementing this with the reverse procedure that results from regressing the arts and design score on performance, we can actually see, whether arts and design activities are the drivers of good performance in applied research or the opposite.

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Keywords: impact, key metrics, indicator system, applied scientific research, art, design

THE ENTREPRENEURIAL HEART-SET: SOURCES OF INSPIRATION TO START-UP A SOCIAL BUSINESS

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Social entrepreneurs found for-profit, nonprofit, or hybrid organisations utilise innovative, business-oriented methods to address social problems, such as homelessness, hunger, or lack of access to medical care. Sources that inspire entrepreneurs not to give up when business difficulties arise include fear, community, god or God, nature or education. These sources of inspiration mostly come from the entrepreneur's connection to the external environment, which results in a deep intrinsic personal motivation: the entrepreneurial heart-set. Within the schools of thought on entrepreneurial beliefs, mindset and heart-set, few scholars explore the intersection between religious convictions and god or God as a source of inspiration for nascent entrepreneurialism. The conference proceeding explores this issue in the context of social entrepreneurship. Precisely, social entrepreneurship explosion and its potential for capturing the scary global social trilemma are significant for policymakers. The empirical inquisition captures entrepreneurs' perceptions and lived experiences related to their sources of inspiration and work. A qualitative method through personal interviews was well-suited for capturing such personal interpretations.
Despite the increasing prominence and prevalence of social entrepreneurship, much remains to be learned. Essential differences between social and traditional entrepreneurs suggest that it would be unwise to assume that theory derived from studying the motivations of traditional entrepreneurs is directly (or at all) applicable to the motivations of social entrepreneurs. Specifically, preliminary interviews focusing on the general topic of entrepreneurial motivations revealed that, for a subset of social entrepreneurs, their religion, defined as the organised system of faith, beliefs, and practice that facilitates interactions with the divine or supernatural, played a key role in their motivations to create social ventures. With these findings as a starting point, this study addresses the following question: How do social entrepreneurs' religious beliefs inspire the founding of social ventures?

A narrative analysis of interviews produced a process model, an explanatory model that summarises a series of cognitive and behavioural steps or outcomes, which elucidates how the religious beliefs of social entrepreneurs can inform their decision to create social ventures. Through the main results, this study finds that entrepreneurs who are driven by religious motivations, hereafter referred to as faith-based social entrepreneurs (FBSEs), undergo a common process through which they become social entrepreneurs and found social ventures. Specifically, narratives of entrepreneurs suggest that FBSEs generally pass through five phases in becoming a social entrepreneur: desire, disenchantment, epiphany, bridging, and enlightenment. Through

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this process, FBSEs can integrate their religious beliefs into their work, which inspires the founding of a social venture. These findings produce insights that have implications for several kinds of literature including social entrepreneurship, institutional logics and "hybrid" (i.e., multi-logic) organisations, and research at the intersection of religion, ethics, and work. Also, the evidence produces real implications for social entrepreneurs and policymakers - as the acknowledgement of god or God as a source of inspiration to business sustainability is uncommon in Western business practice.

An inductive methodology was used to explore individuals' experiences with religion and work in the context of social entrepreneurship. This approach was appropriate because, as highlighted in the previous section, there is not a reservoir of existing theory in entrepreneurship and religion that can be drawn upon to help explain this phenomenon. Moreover, one of the most effective methods for capturing entrepreneurs' first-hand accounts of their experiences is collecting their narratives.

Interviews were conducted with 50 individuals in the social entrepreneurship sector. Informants were chosen to represent a wide range of perspectives (e.g., for-profit, nonprofit, hybrid) and a diverse collection of industries to increase the generalisability of the findings. However, the primary inclusion criteria for the study is that informants had to be the lead entrepreneur or co-founder of an organisation that satisfied the three primary characteristics of a "social venture" – that is, addressing a social problem, innovatively, using business methods. The initial informants of the study were located in a large, metropolitan area in Lagos, Nigeria. These informants were identified by searching local media articles and websites for phrases such as "social entrepreneur," "social venture," and "social enterprise" and from the first author's contacts in the local entrepreneurship community. Subsequent social entrepreneurs were identified through "snowball" sampling methods based on recommendations and introductions made by other informants. The final sample comprised informants representing multiple municipalities (e.g., Ikeja, Akure-South, Ibadan) in Nigeria. Finally, all interviews were digitally recorded and then transcribed.

ATLAS.ti, a qualitative data analysis program, was used to increase the ease of organising, sorting, and retrieving the data. After completing the interviews, within and cross-informant analysis was conducted. The goal of the within-informant analysis was to understand the perceptions and experiences of each and to begin to develop generalised codes, themes and constructs. In contrast, the across-informant analysis was used to "triangulate and substantiate" emerging findings. The narratives of each informant served to either confirm or disconfirm insights gained from other informants. Emerging patterns, processes, and themes were examined to determine if they were present across multiple informants. The process model that emerged was refined using the replication logic; that is, each informant was treated as a separate "test" that either confirmed or disconfirmed the generalisability of the insights of other informants. Furthermore, while constructing the process model that is described in the next paragraph, the data from each interview was used to challenge or extend the working theory.

The findings revealed that one motivation for becoming a social entrepreneur is that founding a social venture allowed for the integration of entrepreneurs' religious beliefs and their work. Since scholars have not examined this topic, an important first step in understanding this phenomenon is to develop a process model. The process model that emerged from our findings entails five phases. The model begins with the desire of entrepreneurs to unite their religious beliefs and work. Disenchantment follows whereby individuals feel dissonance between their current work status and their unfulfilled desire. Phase three is an epiphany insight into the merits of social entrepreneurship. The bridging phase is the realisation that a social venture is a viable faith-work integrating mechanism. Lastly, FBSE's experience enlightenment in their

understanding of how their work and spiritual beliefs relate to one another.

It is important for policymakers to understand what motivates someone to become a social entrepreneur, also faith-based entrepreneurs should not assume that they get a "pass" on creating a sound business that delivers a quality product or service and that addresses a clear customer need merely because they are operating a social venture that is motivated by religious beliefs. Indeed, in fostering the social-good and faith-based elements of the venture, FBSEs should not lose sight of the primacy of developing a strong business. In sum, FBSEs should approach issues associated with the marketing of their ventures deliberately and with caution.

Keywords: Ontology and Work, Entrepreneurial Motivations, Social Entrepreneurship, Beliefs, Entrepreneurial Heart, Set

Entrepreneurship Education And Technological Work Readiness Of Exit Level Students in Nigeria TVET Institutions

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ENTREPRENEURSHIP EDUCATION AND TECHNOLOGICAL WORK READINESS OF EXIT LEVEL STUDENTS IN NIGERIA TVET INSTITUTIONS

Abstract

The Digital Revolution also known as the 4th Industrial Revolution is anticipated to usher in a higher level of automation and systemic synergy in manufacturing activities. Digitisation of production activities will lead to mass business prospects, where smart robots will coordinate production and supervise assembly lines. This new disruptive technology will lead to accelerative technological unemployment. Scholars have noted that computerisation of jobs will create labour market disruption as skilled labour will increasingly become obsolete leading to technological unemployment. It has been argued that increasing computerisation of production activities will create significant job loss of about 50% in a decade. Currently, autonomous intelligence has given rise to the emergence of self-driven cars, pilotless drones, self-service check-outs, and ATMs, these have already created a loss of jobs in banks, restaurants, and manufacturing operations. However, this "creative disruption" leading to job loss also create new jobs. Yet, it has the possibility of becoming the most challenging societal concern in the twenty-first century. It has been further suggested that the acquisition of new skills is the prevailing ability over technological unemployment.

Therefore, advanced practical vocational skills are required to respond to technological changes. This is in line with the assertion that the demand for technical and vocational skills is increasing due to technological changes and economic competitiveness. Technical and Vocational Education and Training (TVET) is a crucial factor that provides practical skills in technology and related sciences to meet social and economic needs. TVET offers lifelong learning skills to become self-employed or successful entrepreneurs through creativity and innovative ideas. But the current curriculum content of TVET institutions in Nigeria is preparing students for jobs that may not be available by the time the students graduate. In the same vein TVET curricular in Nigeria lacks adequate programmes that provide relevant technical skills and entrepreneurship skills. Furthermore, the non-inclusion of entrepreneurship programmes in the curricula and wrong societal perception towards TVET are some of the challenges of entrepreneurship education in Nigeria. Scholars have stated that creativity, innovativeness, and problem-solving skills are some of the 21st-century skills needed by TVET students to be technologically ready

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for the future of work. Creativity, innovativeness, and risk-taking ability are key ingredients of entrepreneurship education. But the students of TVET institutions in Nigeria lack the essential entrepreneurial skills such as risk-taking ability, innovativeness, and managerial skills to venture into business and sustain it. However, TVET institutions have a special obligation to equip students with technical skills and entrepreneurship skills to become job creators and not job seekers.

A quantitative approach was adopted to determine the relationship that exists between entrepreneurship education and students' technological work readiness in relation to the computerisation of jobs in the future. Questionnaires were administered to students, and SPSS was used to test the correlation between entrepreneurship education and students' technological work readiness.

The study found a strong positive association between entrepreneurship education and students' technological work readiness. While business management skills and personal entrepreneurship skill were found to be significantly associated with high technological work readiness, technical skills were not significant. There is a need for curriculum reform to address communication skills, written skills, human relations skills, risk-taking skills and problem-solving skills.
There is a strong emphasis on practical training such as workshops and seminars on how to identify and take business advantage in Information Communication Technology (ICT), software development, graphic designs, automation, computer engineering, electronic engineering etc. To prepare students for technological work readiness and global competition, government and private institutions need to commit huge investment in entrepreneurship education of TVET institutions.

Keywords: entrepreneurship education, entrepreneurship skills, curriculum, tvet, technological unemployment

Sustainability Management in Non-Governmental Organizations

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Like the rest of the world, also Non-Governmental Organizations (NGOs) and Nonprofit organizations (NPOs) facing global social and ecological challenges, like poverty, hunger crisis, global warming, pollution, and water scarcity. "An examination of the key responsibilities of an organization, within the context of its contribution towards sustainable development and the challenges it faces in relation to sustainable management [...] soon makes it clear that although the challenges facing NPOs may not be the same as those facing profit-orientated enterprises, they are certainly very similar. Regardless of their origin and legal form, in ecological terms, organizations are called upon to reduce all their direct and indirect negative impacts on the natural world to an absolute minimum." (Daub et al. 2014, p. 3256). NGOs (in the following we use the more comprehensive term NGOs, also for NPOs) are "[...] formal (professionalized) independent societal organizations whose primary aim is to promote common goals at the national or the international level." (Martens 2002, p. 282). Therefore, they address social and/or ecological challenges often through their direct work. Valentinov and Vaceková (2015) call this the demand-side of NGOs: the societal problems addressed by NGOs. However, what about the supply-side of NGOs, the behavior of their managers and entrepreneurs, the structures and functions of NGOs? In which way can the management of NGOs contribute to ecological, social, and economical sustainability itself?

Relating to sustainability management in NGOs, there are some discussion points in the literature: accounting and accountability, transparency and reporting, role of top management, stakeholder management, financial sustainability, and a new market orientation. Accounting and accountability are seen as key process in advancing sustainability in public services to respond to public fears about the quality and integrity of nonprofit work and to tempering exaggerations by nonprofits of their own achievements (Guthrie et al. 2010; Jones & Mucha 2014; Manetti & Toccafondi 2014). Transparency creates understanding and sustainable reporting give NGOs the chance to highlight their success and their contributions to the community while also providing an account of areas, that are challenging or problematic and may be improved (Daub et al. 2013; Jones & Mucha 2014). The top management of NGOs can play an important role for obtaining a successful sustainability management (TCC Group 2009; Muscalu & Bădiţă 2016). Stakeholder management is also seen as an important driver for sustainability management in NGOs (Hamukwala et al. 2008; Low & Davenport 2002; Moldavanova & Goerdel) and having a sustainable management in NGOs can fulfil the legitimate needs of stakeholders and help to keep financial sustainability (Daub et al. 2013). The influence of neoliberal ideology has led to

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mounting pressure for NPOs to turn to market practices and quantifiable metrics to ensure continued operations. With this market orientation, sustainability for NPOs has been redefined to emphasize their ability to navigate an unstable financial landscape (Jensen 2018; Weerawardena et al. 2010).

However, there are only a few empirical publications relating to sustainability management in NGOs (mostly dealing with financial sustainability), especially in Germany. Daub et al. (2014) state "The numerous empirical and conceptual studies that have been conducted over recent years concerning the social responsibility of enterprises and their contributions towards sustainable development have given very little consideration to non-profit organizations (NPOs)." (p. 3252) and "An examination of the literature in the field of NPO research yields a comparable result. Here, too, there are hardly any conceptual approaches or empirical studies on the sustainability of NPOs through the incorporation of ecological and social aspects within their structures, processes and activities." (p. 3253). Daub et al. (2014, p. 3263) see clearly a significant need for action as regards empirical research. This leads us to our research topics. Together with a humanitarian NGO from Germany we want to analyse elements of sustainability management in NGOs and their dissemination in Germany. Following up, we want to analyse the maturity level of sustainability management in the NGO-sector in Germany to derive recommendations for action.

To address these research topics, we started with a systematic literature review (Briner & Denyer 2011). The aim of the review was to investigate the current state of research on the connection between sustainability management and NGOs internationally and in German-speaking countries. We searched the databases of EBSCO, Socpus, Web of Science and the online library of the Chemnitz University of Technology in English and German. With a combination of keywords, like sustainability management, Non-Governmental Organization, NGO, Nonprofit organization, or NPO (and German equivalents), we identified 3572 results on the key date eight of July 2019. The eligibility for further analysis of the retrieved literature was evaluated based on a set of predefined inclusion and exclusion criteria. Inclusion criteria in these searches specified that the texts must be written in English or German and be in the form of an academic journal article, book, book chapter, or conference paper. We considered texts independently of the published year. Exclusion criteria were duplications, inaccessibility of the texts, and papers without full text availability. We also excluded texts, if the content were irrelevant, e.g., only one concept was focused and the connection between sustainability management and NGOs was not addressed. At the end, we identified 31 texts for further analysis. These texts were empirical and/or conceptual respectively, normative and a period from 2002 until 2018 were covered. We identified the following categories in the texts by using an inductive qualitative content analysis (Mayring 2014): triggers, drivers, barriers, processes, approaches/strategies, and theories.

A review relating to a maturity model of sustainability management in NGOs produced no results. Therefore, we plan to incorporate results of our review relating to elements of sustainability management in NGOs in a general maturity model of sustainability management.

Following up, we want to conduct qualitative case studies (document research and expert interviews) to evaluate and deepen our insights from the literature review relating to sustainability management and the measuring of the maturity level in NGOs. One case will be our research partner and it is planned to analyse approximately five more cases, which are part of their various NGO networks. Planned results of these qualitative case studies are a framework for sustainability management in NGOs as well as a relating maturity model. Based on the results we want to generate hypotheses relating to influencing factors of sustainability management in NGOs and the maturity level. We want to test these hypotheses subsequently with a quantitative survey and a larger sample, again using the partners of the networks of our research partner.

The research project is planned until March 2020. As overall results, we expect an empirical overview of sustainability management in NGOs in Germany as well as an evaluated maturity model. This maturity model for sustainability management in NGOs can serve as a benchmark tool to identify need for actions in NGOs relating to their own sustainability management.

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Keywords: sustainability management, Non Governmental Organization, Nonprofit organization, sustainability, maturity level, dissemination

Abstract

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What is the Problem?
Dissatisfaction from Natives and foreigners in connection to migration and intergration keeps raising because of different expectations. The natives expect that the foreigners should be well integrated, learn the language, learn the culture from the host countries which is believed to be a way to a happy and successful life in the host country. The foreigners are expecting that the host countries should respect them and their cultures and should integrate them in these societies. Often you will realise that the foreigners are not given big chances to show their capability, to show part of their culture and show the natives part of their life. This ends up sometimes as a grudge between the two, one blaming the other for not wanting to learn the native culture and the other blaming the other for hating them for who they are or for being foreigners.

Why is it important?

It is important for both sides to respect and to have desire to learn from one another to be able to live in harmoney. We expect the immigrants to learn a lot from us but we are showing less interest in learning about them and their culture. It is important to encourage one another and to show interest in the other side, not only to expect the other to learn from us but to be ready and willing to learn from them.

What did you do?

I love to do music and dance concerts, and workshops where I love to teach people about my culture and my language. Through teaching people some small songs in my own home language (Runyankore), I try to draw attention to the people to show them how it is fan to learn another completely new language or how it is also a challenge. In this way, people tend to be in my shoes how it is hard to learn another language. Through this, I have found it as refreshing because I found out that through music concerts and workshops, I have managed to improve my two foreign languages (German and Czech) without having to sit down and concetrate but through having to translate the words from my mother tongue to these two languages and I have found it fan and one of easy way to learn a language.

What did you find?

I have found out that foreigners feel happy and good about themselves if they are given a chance and a platform to present their own cultures, to show what they can, it can be food, music, theater but the chance to present themselves and their cultures gives them also the love and power to learn a new culture in which they are newly intergrated in and this is what I

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would call the peaceful living together which in the end lays a good foundation for sustainable development. Where there is no hate, no war, there is always a fertile ground for promoting sustainble development.

MY RECOMMENDATION WOULD BE:

Let us learn and be willing to learn from another. Let us not only expect the other to integrate themselves into us but let us altogether be integrated. Give new people who come to us platforms to share with us their experiences, their cultures, their knowledge, their languages etc and in so doing the desired sustainable development would be achieved without hardwork but would be achieved smothly in unexpected manner.

When we do music, sing and dance together, there is rearely time for war and hate. I would like to present my part in a form of a workshop, drum and dance workshop where we are able to drum together, to learn to be together but manage to remain individuals (each person drums in a group but keeps his personal rhythm), to manage to keep time (time management) so as not to interrupt other rhythms) and in the end have fun together, refresh our minds and in the end perform our workshop piece uninterrupted and hopefully be happy for an achieved production. Hopefully through my workshop, we could be able to sew fertile ground for Creativity, Innoation and sustainability.

Keywords: Music workshop, music for sustainable development, Culture, intergration through own culture

The Corporate Governance and Transactions-Costs in Distributed Autonomous Organizations. A Case Study on "The DAO", a revelatory Experiment in Blockchain-based Enterprise Building.

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What is the problem and why is it important?
By synchronizing a ledger of transactions over a peer to peer network, whose entries are cryptographically chained together, blockchain technologies enable the unique identification of the holders of transferred assets, and a tamperproof record of the transactions within the network (Nakamoto, 2009). As the bitcoin cryptocurrency has proven, this combination of established digital technologies for the first time removes the double-spend problem of electronic cash and can make intermediaries like banks and clearing houses obsolete (Jentzsch, 2016; Nakamoto, 2009). The underlying technology can potentially be applied to all transactions which are or can be represented digitally, and thus radically reduce transaction costs by lowering the number of necessary steps in transactions as well as removing some of the human actors involved, effectively redistributing agency between humans and algorithms (Rammert, 2003, 2008). By reducing the amount of human labor involved in transactions, some of the risks of maladaptation and self-interest are supposed to disappear as well, making firms more efficient and more effective. The introduction of smart contracts allowed blockchain-based transactions to be automated and to be applied to different processes in incumbent and emerging businesses, e.g. in IoT devices and supply chains, making them faster and more secure (Christidis & Devetsikiotis, 2016; Cong & He, 2018; Cuccuru, 2017). Blockchain technologies and especially smart contracts have given rise to the idea of a new form of organization, in which human actors are pushed from the center to the boundaries of the firm, culminating in the concept of the Distributed Autonomous Organization (DAO) (Buterin, 2013). DAOs are firms, based on a collection of smart contracts and fully implemented on top of a blockchain network.

Decentralized autonomous organizations represent a new form of enterprise. Unlike their predecessors, the so-called distributed applications, applications run on a blockchain network, DAOs manage capital autonomously and are controlled by smart contracts. The smart contracts contain statutes, company contracts as well as rules of procedure. Thus, a centrally organized management is not necessary, because this work is done by internal and external agents (employees and specialists, respectively). It is, therefore, the highest and most complex form of an

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entity of smart contracts (Voshmgir, 2016: 14). Duivestein et al. (2015: 28) define the DAO as a decentralized network of autonomous agents that performs a performance maximizing production function.

In a DAO, Buterin (2013) speaks of a balance between automation and capital in the context of what distinguishes decentralized organizations from traditional companies. Essentially, DAOs are a change from already automated organizations, which previously had no capital of their own. Using a blockchain and smart contracts, capital is added and hybrid business models are created to optimize the level of automation for specific applications. In this case, human governance is on the fringes of operational business, while automation itself is at the center (Buterin, 2014). "Corporations [...] are people. [...] In any case, it's nothing more than people and contracts all the way down. However, here a very interesting question arises: do we really need the people?" (Buterin, 2013) Buterin builds his argument from the experience of the industrial revolution, which made it possible to replace human labor with large-scale machines. The decisive question for him is whether the "problem" can also be approached from the other direction: Can management also be removed from the equation, even if people who perform certain specialized tasks are still needed? (Buterin, 2013)

What did you do?

The aim of this study is to examine the efficiency of distributed autonomous organizations (DAOs) derived from differences in corporate governance structures and transaction costs as well as tracing the redistribution of agency between humans and algorithms in DAOs compared to traditional organizations, relying on people and physical localities. Core assumptions on these differences from academic and grey literature are integrated into a model of the governance layers of the innovative socio-technical arrangement, which is a DAO (Hawlitschek, Notheisen, & Teubner, 2018; Hileman & Rauchs, 2017; Rauchs et al., 2018). We test this conceptual model against the case of "The DAO", an early experiment in distributed autonomous organizations, which was forced to be dismantled after a hacker stole around millions of ether, the cryptocurrency of the blockchain network, "The DAO" was implemented on, in 2016. The case history and its effects on actors in and outside "The DAO", like the founders of "The DAO" and the whole user base of the Ethereum network, highlights important aspects to be considered in judging the efficiency of governance structures of DAOs and related transaction costs.

Building on current research as well as predictions in regard of the corporate governance and transaction costs in the blockchain economy, with a focus on DAOs, we derive core assumptions on possible impacts of blockchain technologies and DAOs on corporate governance and transaction costs, which we integrate in a model of the relevant technological and behavioral layers of this new form of organization. This model also shows the structural differences and the redistribution of agency in a DAO, compared to traditional organizations. We then test this conceptual model on the case of "The DAO", an important experiment in creating a DAO, which garnered a lot of attention at the time and which aides to expand and modify the insights gained from previous research (Eisenhardt, 1989; Yin, 2003). The case study is built from research and grey literature on "The DAO" as well as two interviews with Christoph Jentzsch, the principal author of "The DAOs'" source-code and founder and CEO of Slock.it GmbH and with Tim Bansemer an advisor and expert in the field of decentralized governance and founder and CEO of inblock.io GmbH & Co. KG (Titscher, Meyer, & Mayrhofer, 2007). The results are used to expand and modify the model introduced earlier (Eisenhardt, 1989; Yin, 2003).

What did you find?

The implementation of an enterprise and large parts of its governance on a blockchain effec-

tively redistributes the agency of the members of the organization transferring some processes (like the validation of transactions) entirely into the code and makes them more transparent or easier to accomplish. This leads to a conjunction of corporate and IT governance that researchers and our interviewees have come to understand as the two layers of the organization (or application) and the infrastructure of blockchain-based applications, such as a DAO (Glaser, 2017; Hawlitschek et al., 2018; Rauchs et al., 2018). The case study shows, that this conjunction can lead to complications, especially when the new enterprise also serves as a testbed for new forms of governance, which can lead to an increase in transaction costs, as long as the new forms of governance have not been established in an efficient way.

Blockchain technologies and DAOs can be seen as a continuation of the reduction of transaction costs, which made internet-based platform businesses so successful. In theory, these costs could now be reduced to a minimum, since all information, reputations, and resources can be viewed online in a distributed network. This saves, for example, the costs of complex control processes. Costs of initiation, settlement, and control in a DAO are lower in comparison with traditional organizations (Hopf & Picot, 2018). However, the costs of agreement depend on how digitized and standardized the corresponding process is and have shown to be significantly higher in the case of complex processes, while in digital and standardized processes DAOs seem to have the advantage over conventional companies. The case-study shows that an efficiency gain, but no higher effectiveness, can be expected with regard to the transaction costs at both macro- and micro-management level. Effectiveness in the case of "The DAO" was hampered by the attempt to combine the digitalization of a company with experiments in a new form of governance but could have been achieved by centralizing management tasks at the macro and micro levels, had the actors submitted and voted for corresponding proposals.

What do you recommend?
Blockchain technologies and corresponding research are still in their infancy and sometimes it seems, like blockchain technologies are a hammer, looking for a nail. As the case study shows, experiments like "The DAO" prove useful if we use them to test out the limits and possibilities the technologies have to offer. If it is our goal to apply blockchain technologies to facilitate a juster and more direct economy with new forms of corporate governance, we recommend continuing experimenting with DAOs in diverse fields. Blockchain-based governance for responsible innovation can't stay with purely digital products and experiments should expand to organizations involving different physical products and services. To bear fruits, these experiments must consider the benefits as well as the drawbacks of blockchain technologies for their use-case, and they need to have a clear understanding of how agency should be distributed among its human and non-human parts, to be effective towards their stated goals.

Keywords: distributed autonomous organization, transaction, cost, corporate governance, case, study, blockchain, innovation

Creativity Ratings of Fashion Outfits Presented on Instagram: Does Gender Matter?

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What is the problem?

The assessment of creativity can have important implications and consequences. From an organizational perspective, creativity assessments by managers affect the chance that a given idea can be further developed and ultimately result in marketable innovations (Lu, Bartol, Venkataramani, Zheng & Liu, 2018), whereas creativity assessments by consumers can contribute to the perceived value and, thus, to the market success of a given product (Horn & Salvendy, 2006). From a research perspective, different methods of measuring creativity are grounded on some sort of creativity judgement, such as the *Consensual Assessment Technique* (CAT).

The CAT was developed by Amabile (1982, 1996) and is often referred to as the "gold standard" of creativity assessment (Carson, 2006, as cited in Kaufman, Baer, & Cole, 2009). It rests on the assumption that the best available assessment of a creative product in a given domain can be provided by the collective judgement of a group of raters with appropriate familiarity (expertise) in that field (Kaufman, Plucker, & Baer, 2008). The CAT has been used to measure creativity in a variety of fields, including organizations (see, e.g., Chua, 2018; Ford & Gioia, 2000; Koseoglu, Liu, & Shalley, 2017), and proved to be a reliable and valid technique for creativity measurement (see, e.g., Kaufman, Plucker, & Baer, 2008).

In spite of its excellent reputation, the CAT methodology still lacks clear procedural standards and a full understanding of the effects of procedural choices (Cseh & Jeffries, 2019). One procedural choice whose influence has hardly been examined is the gender composition of rater groups. By investigating gender differences in creativity assessment, this paper analyzes the effects of rater panel composition.

Why is it important?

The question of gender differences in creativity ratings is worthwhile exploring. According to Martin and Wilson (2017, p. 418), "[...] it is known that judgement of creative worth can be influenced [...] through membership of social groups, such as gender [...]." As most experts are male (Runco, Cramond, & Pagnani, 2010), the gender composition of rater panels could introduce a bias into CAT methodology. Any bias-whether conscious or unconscious-can have a severe impact on creativity scores (Kaufman, Niu, Sexton, & Cole, 2010).

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By analyzing implicit (gender) biases in the CAT, this paper explores the circumstances under which the CAT is indeed a reliable method to measure product creativity in research studies, thereby contributing to the validation of the methodology. In this way, it draws on a recent reference to "the need for new debate and a program of research to clarify, evidence, and harmonize CAT methodology" (Cseh & Jeffries, 2019, p. 159).

What did you do?

To explore gender differences in creativity assessment, we set up a rating procedure in line with the various requirements of the CAT (see, e.g., Kaufman, Plucker, & Baer, 2008).

As rateable products, we used female fashion outfits presented on the social media platform *Instagram*, which were collected based on a rigorous selection process. To allow for subsample analyses, outfits were either presented by well known "social media influencers" with at least 100,000 followers or by less known users with less than 10,000 followers ("type of user" subsamples). Additionally, outfits were selected from three different categories ("type of outfit" subsamples), characterized as either *standard* ("everyday" outfits), *non-standard* (extravagant outfits), and *revealing* (outfits with high skin visibility). The outfit selection process resulted in a main sample of 90 fashion outfits (2 types of Instagram users x 15 Instagram users per type x 3 types of outfits per Instagram user).

As raters, we recruited 65 students of a public university, consisting of 26 males and 39 females. Although the CAT requires raters to be closely familiar with the domain in which a product was created (Amabile, 1996), previous research could neither provide conclusive evidence on the required level of expertise nor on when and why the use of expert raters is indeed essential (Cseh & Jeffries, 2019). Since Freeman, Son, and McRoberts (2015) showed that nonexpert and expert raters did not differ in their creativity evaluations of fashion design illustrations, the use of student raters was deemed adequate for the present study.

The rating procedure was conducted in the computer laboratory of a public university, in which each rater worked independently and completed an online survey on his or her own computer (shielded by partition walls). In order to be able to provide ratings relative to all other fashion outfits, all raters received physical booklets with pictures of all fashion outfits, allowing them to compare outfits at all times. All 90 outfits were presented in randomized order and had to be rated on a 7-point Likert scale, ranging from 1 (*very uncreative*) to 7 (*very creative*). After the rating procedure, we used open questions to ask raters for the reasons that led them to either rate a fashion outfit as highly creative or highly uncreative.

The obtained data was analyzed in three ways. First, we analyzed gender differences in rating levels. Computing independent means t tests, we tested mean ratings of male and female rater panels for statistically significant differences. Second, we examined gender differences in rating consistency and used a recent confidence-interval-based procedure (Bonett & Wright, 2015) to test for significant differences between inter-rater reliabilities of male and female raters. Inter-rater reliabilities were estimated using both Cronbach's coefficient alpha as well as Spearman–Brown adjusted alpha (which allows for a comparison of rater panels under the assumption that groups have equal numbers of judges). Third, using content analysis (Krippendorff, 2013), we complemented our quantitative approach with a qualitative analysis of the criteria (implicit theories of creativity) that judges applied when providing their creativity assessments. To do so, we assigned each of 455 statements on why raters regarded an outfit as creative or uncreative to one of 24 categories of (preferably) distinct criteria. As categories can still contain nuances of similarity among one another, we additionally followed Long's (2014) approach of grouping different categories under frames of similar meaning, resulting in 7 different frames. Then, we

analyzed the frequencies of mentioning the different frames for both male and female raters and tested these for significant differences using chi-square tests of independence.

What did you find?

First, our analysis of gender differences in rating levels indicated that males and females did not provide different ratings for the creativity of female fashion outfits. Although male raters generally provided higher mean ratings than female raters did, these differences were mostly statistically non-significant. The two subsamples that yielded significant differences did not show any systematic pattern, with male judges assigning higher ratings in one case (*revealing* type of outfit) and female raters providing higher judgments in the other (*non-standard* type of outfit). These results are in line with previous findings reported by Kaufman, Niu, Sexton, and Cole (2010), who did not detect any significant rating differences between men and women either.

Second, our examination of gender differences in inter-rater reliability showed that both female and male rater panels provided fairly consistent ratings, with Cronbach's coefficient alphas usually exceeding common minimum standards of reliability of .70 (Nunnally & Bernstein, 1994) or .80 (Lance, Butts, & Michels, 2006). Irrespective of the inter-rater reliability estimate used (Cronbach's coefficient alpha or Spearman–Brown adjusted alpha), rating consistency was higher among female raters than among male judges. Testing for differences yielded significant gender differences in the main sample as well as in all but one subsample, namely *revealing* outfits. These results are in line with previous findings from various disciplines, including creativity research (e.g., Kaufman, Niu, Sexton, & Cole, 2010) and more general psychological research (see, e.g., Pinker & Spelke, 2005).

Third, our content analysis suggested that the relative importance assigned to certain creativity assessment criteria differed between male and female judges. Specifically, we found that females based their judgements more often on artistic, imaginative and playful components of fashion outfits, whereas males assigned more weight to the mere appeal of an outfit and its appropriateness in a given context. As females-compared to males-attached more relative importance to their top three frames, our findings are in line with the higher rating consistency among female judges.

What do you recommend?
Overall, this study suggests that rater panel composition can indeed affect aspects of creativity assessment, in particular rating consistency (inter-rater reliability). However, we did not obtain strong support for implicit biases in the CAT methodology. Accordingly, this study contributed to the validation of the CAT as a reliable method to assess product creativity, suggesting that gender composition is not a factor that researchers necessarily need to consider when assembling rater panels. Yet, to attain high inter-rater reliability in future studies using the CAT-including those in organizational contexts-, we recommend including female judges in rater groups, a suggestion that is often not adhered to (Runco, Cramond, & Pagnani, 2010).

Keywords: Consensual Assessment Technique, creativity assessment, gender differences, fashion, implicit theories of creativity, Instagram

Influence of Product Convergence on the Disruptive Susceptibility of Value Networks and the Disruptive Potential: A Replication Case Study of the German Digital Camera Market

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Convergence and disruption are often observed in digitalised markets and products. Although the theory behind both these phenomena is improving individually, the relationship between convergence and disruption is rarely understood. Therefore, in this paper, an attempt is made to examine the influence that converging products have on disruption. Frameworks anticipating Disruptive Innovation are used to assess the same (e.g. Rafii and Kampas, 2002; Adner 2002; Christensen et al. 2004; Hüsig et al. 2005; Kostoff, 2004; Paap and Katz, 2004; etc.). The goal of this paper is to analyse whether a new-market DI caused by a convergence product has any influence on the concepts of Disruptive Susceptibility and the Disruptive Potential to anticipate Disruptive Innovation (Christensen et al. 2004; Christensen and Raynor, 2003; Henderson and Clark, 1990; Kalyanasundaram and Lewis, 2011; Klenner et al., 2013). In order to achieve this, the initial study by Klenner et al. (2013) on Disruptive Susceptibility is replicated and expanded through the application of the framework to analyse the Disruptive Potential of an innovation (Keller and Hüsig 2009). The case of the disruption of the digital cameras by mobile and smart phones in Germany from 1996 – 2014 is explored using large amounts of quantitative and qualitative data. The results of this study indicate that the Disruptive Susceptibility of the examined value network of the digital cameras in Germany was low but at the same time, the innovation showed a high Disruptive Potential. However, a disruption happened in the market at a later point in time. The Disruptive Potential framework exhibited consistent results with case study and was validated ex post. It can be reasoned that the Disruptive Susceptibility framework poses some limitations in predicting new market Disruptive Innovation by convergence. The Disruptive Potential framework remained unaffected by the type of Disruptive Innovation (digital to digital or analogue to digital/new market or low end). Additionally, it seems a practise-relevant option for ex ante analysis when the potential Disruptive Innovation is already known. We also found that the framework for analysing the Disruptive Susceptibility of a market seems better suited for technological substitution at a component level in combination

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with a low-end disruption but at a lesser degree for architectural innovations and for new-market disruptions induced by convergent products. The latter aspect represents an important boundary condition for the Disruptive Susceptibility framework and needs to be further elaborated in future studies.

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Keywords: Convergence, Disruptive innovation, Disruptive susceptibility, Mobile phone camera, Replication, Technology forecasting, Digital Disruption

New Market Creation with Big Data-Driven Disruptive Innovation

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This research focuses on the role of different actors in the new market creation for industrial manufacturers in Big Data (BD) driven innovation. Although BD have been playing an important role in innovation, top industrial manufacturers like General Electric (GE) and Ford failed in their initial efforts for creating BD driven business. On the other hand, industrial manufacturers like Boeing and Mercedes gained success in the BD-driven new market. Despite different industrial manufacturers diving into the BD-driven new market, the role of different actors in the BD-driven innovation in the context of industrial manufacturers is not clear.
Industrial manufacturers are expanding businesses towards digital services enabled by big data generated from industrial equipment. However, they find themselves in a challenging position in understanding the role of different actors including their customers in deploying big data. The high-end customers of the manufacturers show little interest in BD-driven innovation because the profit margin from the innovation seems to be low. Therefore, the innovation creates little value for customers and the manufactures fail to capture value. The manufacturers also face competition from actors that do not manufacture physical products but offer similar BD-driven services. This way a new market is created. This research sheds light on *how heterogeneous actors create a new market to carry out BD-driven disruptive innovation.*

BD-driven innovation is categorized as a disruptive innovation in this research. "A disruptive innovation introduces a different set of features, performance, and price attributes relative to the existing product, an unattractive combination for mainstream customers at the time of product introduction because of inferior performance on the attributes these customers value and/or a high price – although a different customer segment may value the new attributes. Subsequent developments over time, however, raise the new product's attributes to a level sufficient to satisfy mainstream customers, thus attracting more of the mainstream market" (Govindarajan and Kopalle 2006, p. 15). Disruptive innovations are simpler, more convenient, and less expensive products that appeal to new or less-demanding customers (Christensen and Raynor 2013).

Data-driven innovation has been explored previously and the connection between BD and innovation has been discussed in the following ways. First, BD is connected to service innovation where BD can be used to increase the personalization of services, by leveraging data as a paradigm (Ng and Wakenshaw 2017). Second, BD can be used for infrastructural innovation by improving the usage of the existing assets (Tempini 2017). Third, BD is explored as the main innovation outcome to build an entire business model around it (Trabucci and Buganza 2019). Fourth, BD is researched as the driver of open innovation strategies to gain new business opportunities (Del

*Speaker

Vecchio et al. 2018). However, little research is done that shows the role of different actors in the creation of a new market when a BD-driven innovation takes place. Over the last few years, we have witnessed the emergence of new markets enabled by BD, but we do not know how different actors contribute to the market. The knowledge of such new market creation will be useful in understating the underlying structure of the market and possibly creating a similar one in the future.

In this research, a case study has been conducted with an industrial equipment manufacturer SmartCargo (a pseudonym) that builds equipment such as forklifts, cranes, terminal tractors and provide services for handling heavy materials in ports, terminals, steel mills, sawmills, etc. Over 2000 equipment made by the manufacturer are connected to a smart portal where the operational data can be monitored in real-time. This research investigates the ongoing activities by SmartCargo to deploy the data generated from the connected equipment in the creation of new BD-driven services and solutions for their customers. Since in the past the company focused more on selling equipment, the opportunities with BD seems to be new territory for them. Different customers have different requirements based on their own businesses. Moreover, actors outside the manufacturing industry such as companies that deal with big data mining and analytics also play a significant role in offering BD-driven services. These heterogeneous actors have created a new market that presents a challenge for SmartCargo to delve into BD-driven innovation. To understand the new market, the author of this paper spent the last 30 months interviewing the internal stakeholders of SmartCargo and their customers, participating in workshops organized by SmartCargo, analyzing the BD generated from the equipment, analyzing the competitors, and attending numerous meetings with the SmartCargo staff.

This research includes the following findings. Although previous research claimed that high-end customers have low interest in disruptive innovation since the profit margin is low, high-end customers like some port operators do take BD-driven innovation very seriously and a few even deployed their own systems and own data analysts. That kind of investments from the high-end customers even made it more difficult for the manufacturer like SmartCargo to offer services enabled by their own analysis of the connected machines. In this scenario, the equipment manufacturer is required to collaborate with the internal data analysts of the customers as an additional support. However, when the high end customer is already using BD-analytics tool from a third party vendor, it is even more crucial for the equipment manufacturer to offer diversified BD-driven solutions to the customers. Otherwise, the solutions would be redundant for the customers. The scenario with the low-end customers is different. They do care about small margins and always are interested in saving money through BD-driven solutions. They often rely on the equipment manufacturer. However, actors such as the data analytics companies can create severe competition for the manufacturer since the companies can offer data mining and analytics services at a lower price. A whole new market is created for these actors that do not manufacture equipment but can be a major player only due to the possibilities of analyzing BD. These data analytics companies not only are the competitors of the manufacturer but also are collaborators of the equipment manufacturer. The observation from this research shows that SmartCargo collaborates with data analytics companies in building a web portal and for BD analytics. In this way, the new market becomes more complex.

This research conceptualizes BD-driven innovation as a disruptive innovation. The creation of the new market enabled by BD should be seen as an example of disruptive innovation where the innovation may not look very profitable for the manufacturers or some high-end customers in the beginning but can be a way for the manufacturer to get more involved with the high end customers. This is because the high-end customers are getting more and more interested in BD-driven services. Moreover, BD-driven innovation is a way for both the manufacturer and the data analytics company to capture economic value as well as collaborate with each other.

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Keywords: Big data, innovation, disruptive innovation

The impact of artificial intelligence on the labour market: perception vs. usage in French companies (extended abstract)

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The impact of artificial intelligence on the labour market: perception vs. usage in French companies (extended abstract)
1+2 Problem and motivation for our research

Artificial intelligence (AI) is considered as an unprecedent disruptive innovation. It refers to a set of techniques and technologies designed to build machines capable of simulating human intelligence. A few countries, including the United States and China, have already entered a global competition to master this differentiating technology. In France, the development of AI is a priority affirmed by the President of the Republic Emmanuel Macron. The report by Cédric Villani (2018) led to an AI development plan that will be financed by the French State to the tune of 665 million euros by 2022. AI is also the subject of scientific, ethical and social debates (Polites and Karahanna, 2013). Our starting point in this study is to assess the possible impacts of AI on the labour market. The *comprehensive literature review presented in the full version of this article* identifies three types of impact:

- The transformation or even suppression of certain professions due to AI-induced automation, in particular "white collar" occupations like accounting and audit, law, insurance, etc. This negative impact of AI is pointed out by Appelbaum and Nehmer (2017), Auger and Girard (2018), Bughin (2018), Chelliah (2017), Dorn (2016), Ford (2013), Koch (2017), Kokina and Davenport (2017), Levasseur (2015), Sharkey and Van Wynsberghe (2017), Thirgood and Johal (2017), White (2017),Wilson and Bataller (2015), Wilson et al. (2019).

- The complementarity of AI with other professions, for example human resources, customer service, medicine, cybersecurity, etc. This positive vision of AI is promoted by Applebaum and Nehmer (2017), Chelliah (2017), Dickson (2017), Grudin (2016), Jones (2017), Kazuo (2017), Kirkpatrick (2017), Kokina and Davenport (2017), Nordlinger and Villani (2018), Silverman (2017), Sumser (2016), Tsang et al. (2017).

- The creation of new professions around the AI technology is foreseen by Dickson (2017), Koch (2017), Regache (2018), Rhodes (2018), White (2017), Wilson et al. (2017).

Our literature review confirms that AI is there. The authors speak of it as a meteoric, totally unprecedented mutation, which will radically and irreversibly transform society, human

*Speaker

relations, work and probably the profession of each of us. AI has the potential to reach all sectors of activity and professions; it raises questions of complementarity but also of substitution with work depending on its nature. Indeed, while this theoretical analysis reveals positive impacts of AI improving workers' lives, it also highlights a significant and potentially devastating impact of AI, in the sense that most occupations including routine tasks that can be automated are likely to be profoundly transformed or even disappear. Most analysts advise against underestimating AI's potential impact on the labour market in the coming years (FRPT Research, 2017). This impact must be anticipated and managed at all costs.

The literature review also shows some limitations. In particular, the publications recorded are largely based on American literature; they exhibit and hypothetically extend the experience of pioneering U.S. companies in AI integration, with positive or negative consequences that cannot be fully transposed to the French or European context (different environment, management style, culture, etc.). Feedback from French or European companies on the theme of AI and employment is still extremely rare in the literature.

From a managerial point of view, there is also a real interest in probing the French labour market to obtain relevant information on key concepts such as the public and companies' awareness of AI issues and its possible business transformations.

It seems important to us to identify the main challenges of this new AI-powered economy (Auger and Girard, 2018; Lafontaine Beaumier, 2018), and especially, the possible impacts of AI on the French labour market and professions. We therefore formulate the following research problem: **"Is AI a threat or an opportunity for our businesses?"** In particular, we would like to know if the perception of AI by the French working population is in line with the reality of its uses in companies. We thus distinguish two underlying questions:

- **RQ1: "Is the French population not (yet) confronted with AI aware of its possible impacts on professions and prepared to face them?"** The purpose of this question is to explore employees' general perception of AI and its relationship to the professions, in particular through their knowledge of AI, their awareness of the potential transformations of their professions and their preparation for these transformations.

- **RQ2: "What impact on business lines comes out from usage of AI in French companies?"** This question aims to collect and analyse feedback from companies that have already implemented AI in order to confirm the positive and/or negative impacts exposed by the literature and possibly to derive best practices and recommendations from their feedback.

3 Empirical studies: perception vs. usage of AI in French companies

In order to get an idea of the awareness of the French population and companies about the potential impacts of AI on the labour market, two studies were carried out: the first with professionals not yet working with AI, and the second with professionals having integrated AI into their business; the responses to these studies were both collected in September and October 2019, and processed end of October 2019. A total of 300 targets were initially contacted through an invitation to participate in a study on the impact of AI on the labour market. We mainly used the LinkedIn professional social network to reach a workforce for whom digital technology is already integrated into the professional daily life, able to have an opinion on the arrival of AI and a forward-looking vision on their profession. We supplemented this prospection with a mailing campaign targeting more diverse profiles and low-represented business segments. Of the 300 contacted professionals, 213 responded to our request. In the invitation, a key question was asked to discriminate between professionals working or not with AI and to refer them

respectively to the quantitative or qualitative survey. 195 people not yet affected by AI were thus referred to a Sphinx link to respond to the quantitative survey, while 18 professionals were invited to enter their availability slots for interviews in a Doodle poll. All survey material can be provided upon request.

4 Summary of findings

The conducted *quantitative and qualitative studies are developed and discussed in the full version of this article.*

Regarding **RQ1 "Is the French population not (yet) confronted with AI aware of its possible impacts on professions and prepared to face them?"**, the quantitative study suggests that individuals who do not yet professionally work with AI only have a partial (positive) awareness of its possible impacts on jobs; nevertheless, they are very keen to be better trained in new technologies, of which AI is part, to prepare for possible transformations in their professions.

Regarding **RQ2: "What impact on business lines comes out from usage of AI in French companies?"**, the qualitative study shows that, if the integration project is well managed, AI does not threaten jobs but instead allows employees' professional skills to increase.

These elements of answer to the two research questions allow us to make some arguments about the stated problem: **"Is AI a threat or an opportunity for our businesses?"** The French population does not seem to perceive, for the moment, AI as a threat (see the negative and potentially devastating impact of AI on professions through automation, advanced by the first paragraph of the literature review). On the contrary, people and the companies' representatives we spoke to, foresee and note rather the positive impact of AI as a complement to current professions, as mentioned in the second paragraph of the literature review. The perception of AI by the French population therefore seems to be completely in line with the reality of its uses in companies, and a positive vision of complementarity with the professions comes out. This conclusion is rather reassuring at first glance, but it should be interpreted with caution. *The contributions, limitations and possible extensions of our research are developed in the full version of this article.*

5 Conclusion and recommendations

In the past, disruptive technological innovations were relatively specialised and had a sectoral impact; workers responded by moving from routine jobs in one field to routine jobs in another. But today, the situation is different with AI: the literature and related professional experiences show that AI and its associated technologies have the potential to touch and disrupt all sectors of the economy. The polarisation of the labour market is a major risk or even a probable consequence: two groups of workers could be distinguished, those who will be able to master data-based technology and those who will not (Alexandre, 2017; Sadin, 2018). To minimise this risk, a major effort of anticipation and accompaniment must therefore be carried out, both by individuals, companies and the government. For the individuals, a first step towards information (and in particular AI news) is already a positive approach. The individuals and the companies will then have to start a concerted reflection: which professions are concerned by automation? *(see the rest and the bibliography in the attached file)*

Keywords: Artificial intelligence, awareness, disruption, French companies, innovation, jobs, labour market, opportunity, perception, professions, technological unemployment, threat, usage

To what extent does artificial intelligence disrupt the energy sector? (extended abstract)

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To what extent does artificial intelligence disrupt the energy sector? (extended abstract)
1+2 Problem and motivation for our research

Artificial intelligence (AI) is considered as an unprecedent disruptive innovation. It refers to a set of techniques and technologies designed to build machines capable of simulating human intelligence. Because of its incredible capacities, AI is now being implemented in various business segments such as banking and finance, military, medicine, police intelligence, law, logistics and transportation, robotics, art, etc. It has a particular weight in the field of energy, where it upsets both the entire industrial chain and consumer habits. The *comprehensive literature review presented in the full version of this article* develops three main ideas:

- Ecological and digital revolutions were conducted in parallel by the governments. While the three first industrial revolutions have brought major benefits for human progress (Johansson et al., 2017 ; Kuruczleki et al., 2016 ; Schwab, 2015), AI is expected to be 'the' accelerator of the transformations linked to the fourth industrial revolution, often referred to as "smart factory" or "industry 4.0" (Aberkane, 2016; Ansip, 2018; (Alexander, 2017; Baller et al., 2016; DiSanzo, 2017; Euzenat, 2018; Festo, 2014 ; Gliozzo et al., 2017; Johansson et al., 2017; Laird et al., 2017; Lefebvre, 2018; McKinsey, 2017; Montealegre and Cascio, 2017; Schwab, 2015; Tractica, 2018). On the one hand, the ecological transition is a revolution in our lifestyles, sustainable development goals representing a collective and civic awareness of the need to act for the planet (German Federal Government 2017 ; Thissen, 2018). On the other hand, through its intensification and globalisation, the adoption of new technologies -even unequally- is transforming our relationship to resources as part of the energy transition (Agrawal et al., 2017; Brand, 2017; Engie, 2017; International Energy Agency, 2015 ; Lievre, 2017 ; McKinsey, 2018; Villani, 2018 ; Viola and Bringer, 2017)

- On the energy industry side, AI and the digitalisation of the sector traced the first concrete steps for the energy transition. In particular, industry 4.0 applied to energy gave rise to the smart grids (Dellerba, 2018; European Regulators Group for Electricity and Gas, 2010; Filipova, 2018 ; International Energy Agency, 2011 ; Knorr et al., 2014; Ridole, 2018; Shabanzadeh et al., 2015). The importance of AI is reflected in the numerous use cases that place AI at the heart of the energy sector (e.g., Allan, 2017; De Pierrefeu and Veron, 2017; General Electric Company,

*Speaker

2016; International Energy Agency, 2016; Engie, 2017; McKinsey 2018 ; Shead, 2017; Schmitt, 2017; Zahariadis et al., 2017).

- On the customer side, AI totally transforms our relationhip to consumption, production and distribution of resources. Indeed, AI allows for the optimisation and customisation of energy resource consumption, and facilitates energy savings (Bidgely, 2018; Carnegie Mellon University, 2014; Charnay, 2015; McKinsey 2018 ; Villani, 2018). Production prerogatives are transferred from producer to consumer (Almahmoud et al., 2018 ; Fortat, 2017; Lammers and Heldeweg, 2016; Yu et al., 2017; Zhang et al., 2018).

So, the transition from an industrial logic to a user-centred service logic led to a new performance dynamic in the energy sector (Feist, 2017; Frolov et al., 2017; Ouvrad, 2015).

With regard to these theoretical elements, the aim of our research is to assess **to what extent AI disrupts the whole energy sector** from producer to consumer. To do this, we formulate the following research questions:

- **How does AI transform the energy value chain? (RQ1)** This question has a general exploratory objective. It aims to understand how IT infrastructure fits into energy infrastructure, what AI technologies are implemented by the actors, what AI permits in the energy sector, how AI streamlines the energy value chain, and what challenges remain to be solved. In particular, it seeks to determine the place of the final consumer in this value chain.

- **What is the real impact of AI in the energy transition? (RQ2)** This question is focused on the energy transition only. It seeks to evaluate the contribution of AI to the energy transition, which parties are involved and benefit from it, and what AI-related challenges remain to be solved in this area.

3 Empirical studies

To answer the research problem and associated questions, two quantitative studies were carried out. The first study, having a broad scope, targeted representative professionals of the energy sector; for reasons of necessary focus, we have chosen the sector of electricity. The second survey, on a more specific issue, required an interviews with AI and/or energy transition experts. So, five actors of the electrical industry (Engie, EDF, Enedis, GRDF, and the Energy Regulatory Commission) as well as fourteen experts were interviewed. The interviews were conducted during the summer of 2019 and processed at the end of September. All survey material can be provided upon request.

4 Summary of findings

The conducted *studies are developed and discussed in the full version of this article.*

Regarding **RQ1 "How does AI transform the energy value chain?"**, by taking the example of the electrical sector, the interviewed actors explain:

- how IT infrastructure (big data, IA, blockchain, connected objects and IoT, mobile devices, computer capacities like storage or analytics...) interweaves and serves the electrical infrastructure,

- which AI technologies (semantic analysis, image recognition, conversational interface, empathy, knowledge management, prediction...) are used by the operators and for what purposes

(operational efficiency, predictive maintenance of production assets, detection and automatic classification of defective entities in the electrical grid, detection and optimisation of consumption combinations and infrastructure deployments, customer knowledge/support/relationship, smart customer management, new offers...),

- what AI permits in the energy sector (smart house, smart factories and buildings, smart cities, smart grids, data centres, centralised production, decentralised production, electric mobility...),

- how AI rationalises the energy value chain (in short, it creates a loop between energy supply, storage, distribution, retail, and consumer demand)

- what challenges remain to be solved (in particular, human responsibility vs. machine autonomy, individual freedom vs. digital trust).

This study concludes that the consumer (company, individual) is no longer just a passive end-user, *i.e.*, the energy receiver at the end of the value chain, but that he fully participates in this chain through two channels. On the one hand, through data control of his consumption, the consumer drives the production, storage... of energy all along the chain. On the other hand, via various green energy production facilities (photovoltaic, wind, hydro), the consumer itself becomes an electricity producer. So, both "on-demand" and decentralised production mechanisms connect the consumer to the beginning of the value chain, which closes the loop.

Regarding **RQ2 "What is the real impact of AI in the energy transition?"**, the interviewed experts have expressed a strong awareness of energy transition among their employees, more nuanced regarding the whole French population. The majority of them know the sustainable development goals and note that individuals' and companies' attitudes are changing in their direction. They all confirm the major contribution of AI to energy industry (*e.g.*, modelling and optimisation of consumption, production prediction, identification of energy losses, infrastructure management and maintenance...). According to them, every participant in the energy value chain benefits from the energy transition (ranging from producers, infrastructure managers, distributors, marketing and service suppliers, major digital actors like GAFAM... to the end-consumer, *i.e.*, companies and individuals). The mid-term developments of AI expected in this sector concern the improvement of automation, behavioural analysis, optimisation and prediction capacities, but many other innovations are proposed. The two main limitations of AI are, for the moment, related to social and ethical acceptance (personal data, prediction, job losses) and to its own very high electricity consumption! AI seems to be a double-edged sword for the energy transition: its technological promises are fantastic but highly energy-intensive.

These elements of answer to the two research questions allow us to make some arguments about the stated problem: **"To what extent does AI disrupt the energy sector?"** In the energy industry, the value chain is totally transformed by AI: new players (companies, but also the consumer itself) enter the market, new initiatives are permitted, thus the value chain has renewed and functions in a new way. On the customer side, AI is a real accelerator in the transformation of our energy uses although the level of lucidity and individual action is still low. Our studies therefore confirm that AI is a catalyst for the transformation of the energy sector. *The contributions, limitations and possible extensions of our research are developed in the full version of this article.*

3 Conclusion and recommendations

"*For a long time, men believed that the universe was eternal. But towards the beginning of*

the last century, through calculation and observation, [...] science discovered that, like life, the universe also had a history. There was a beginning and there will be an end." (translated from D'Ormesson, 2016). Many experts predict the extinction of the universe for ecological reasons and depletion of energy resources. AI positively influences our modes of energy production and consumption. But to keep our planet alive, the energy industry as well as consumer companies and citizen need to completely rethink their relationship to energy. While the energy giants are organising themselves and companies are slowly integrating sustainable development into their activities, the population must be supported to persevere in its efforts. *(see the rest, our recommendations and the bibliography in the attached file)*

Keywords: Artificial intelligence, actors, disruption, energy sector, energy transition, impact, innovation, value chain

Is blockchain technology disrupting supply chains? Two studies conducted around Chemnitz (extended abstract)

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Is blockchain technology disrupting supply chains? Two studies conducted around Chemnitz (extended abstract)
1+2 Problem and motivation for our research

To adapt to current changing environment and remain competitive, one possible choice for companies is to use innovative technologies such as cloud computing, big data, artificial intelligence or the blockchain. The blockchain is an emerging technology consisting in a list of records, called blocks, that are linked using cryptography. Iansiti and Lakhani (2017) define the blockchain as "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way". A blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data (Narayanan et al., 2016). So, once recorded, the data in any given block cannot be altered retroactively without alteration of all subsequent blocks, which requires consensus of the network majority. Blockchains may be considered secure by design and exemplify a distributed computing system with high fault tolerance. The blockchain has many intrinsic qualities and, as a result, is now being implemented by companies in several areas (such as cryptocurrencies –which was the primary use of the blockchain–, video games...) and sectors of activity (mainly financial services and supply chains for the moment). In particular, there are a number of efforts to employ blockchains in supply chain logistics and supply chain management, which are at the heart of this research.

The *comprehensive literature review presented in the full version of this article* first explains how the blockchain technology works, and then exposes three ideas:

- Traditional supply chains are currently reaching organisational limits, which prevent them from improving their efficiency. Among them, the lack of transparency of the network in case of many intermediaries (Casado-Vara et al., 2018), the difficulty to share real-time information among all the members (Sissman and Sharma, 2018; Ramachandran and Yuna, 2018), the lack of traceability (Figorilli et al., 2018; Giles, 2018; Yuna, 2017), a risk of errors due to human checking and manual actions (Tripoli and Schmidhuber, 2018), a risk of or fraud as well as of suspicious, illegal or unethical practices; costly and time consuming manual processes (Saberi et al., 2018), etc.

*Speaker

- The blockchain could be a solution to the abovementioned problems, providing at the same time permanent transparency (the network would no longer be opaque, cf. O'Leary, 2017), traceability (every piece of information regarding the journey of a good would be recorded, cf. Crosby et al., 2016; Iansiti and Lakhani, 2017), efficiency (Garman, 2018) and real-time information sharing (the blockchain transmits data in real time, which erases asymmetric information; it is faster since running into clouds, cf. Eikmanns, 2018), decentralisation and security (a decentralised system is less susceptible to hacking, corruption or crashing and promotes trust, cf. Saberi et al., 2018). Regarding the security and immutability features in particular, the blockchain technology makes fraud impossible because every actor involved has access to shared information, which facilitates the identification of a malicious actor; anonymity is guaranteed by cryptography (hash algorithms); all this provides confidence (Tripoli and Schmidhuber, 2018). Moreover, the blockchain technology relies on the use of "smart contracts" (which are pieces of computer code typically built into the blockchain to ease, check or negotiate a contract agreement) and provides therefore smart execution (Steiner and Baker, 2015). The consensus mechanism of the blockchain removes the need of intermediaries and guarantees auditability; companies can also save money because removing intermediaries makes the cost structure more efficient, lowers fees and fasters transactions (Tripoli and Schmidhuber, 2018).

- But the blockchain technology raises new concerns, too! In matter of security, even if the transactional record is unalterable, an alteration/error/fraud could happen at the very beginning of the blockchain (Apte and Petrovsky, 2016); a malicious actor could also act on the product without writing it in a block. Since the blockchain is unalterable, none of the parties can modify or delete any record of the blockchain, *e.g.* a system error or a human mistake, without the consensus from the other parties (O'Leary, 2017). Even if trust comes from smart contracts, records remains relatively uncheckable. Regarding the total transparency criterion, the clear vision of the whole supply chain could transform the partner relationship to competition (Sissman and Sharma, 2018). To create a consensus, companies need to modify their business and especially their organisational culture to adapt to the technology; moreover, it may be very costly to reach a consensus between all involved parties (Saberi et al., 2018). The blockchain doesn't replace the auditing and quality check from the beginning (Figorilli et al., 2018). At last, blockchain will take time to be adopted alongside producers, retailers and even consumer (Iansiti and Lakhani, 2017; Yuna, 2017).

As a result, the literature gives a mixed picture of the blockchain: most authors, surfing on current trends, (only) highlight the disruptive aspect of the technology "solving all problems". But we cannot ignore the "small flaws" of the technology, especially if it is intended for a massive and widespread implementation in companies in the near future. We therefore decided to investigate the reality of blockchain implementation in companies by formulating the following research problem: **"Is blockchain technology (really) disrupting supply chains?"** Moreover, we distinguish two underlying research questions:

- **What are the strategic issues at stake and operational uses of the blockchain in companies? (RQ1)** This question has a general exploratory objective. It aims at understanding why companies (especially within a supply chain, since we focus on this activity) decide to implement a blockchain from the strategic point of view, and how they operationally use the blockchain once implemented in their daily activities.

- **What actual difficulties do companies have in implementing and/or using their blockchain? (RQ2)** This question has a much more limited focus since it seeks to confirm or deny the difficulties perceived from literature related to the blockchain implementation and/or utilisation, and perhaps even to identify other (new) difficulties.

3 Empirical studies conducted (in a wide area) around Chemnitz J

In order to learn more about the blockchain, its stakes, uses and limitations in supply chains, two studies were carried out. To overlap with the ArtemOCC conference, we took advantage of contacts in Germany to specifically conduct our studies with companies around Chemnitz, and more largely in two States of the Federal Republic of Germany, namely:

- States of "Saxe" and "Saxe-Anhalt" (several respondent companies are located in Chemnitz, Leipzig, Dresden)

- Brandenburg State (with respondents especially around Berlin)

For both studies, we targeted respondent companies involved in a supply chain and using a blockchain in their activity.

The exploratory quantitative study aims to generally explore the strategic issues at stake and operational practices in companies using blockchains. The questionnaire includes 40 questions divided into two sections around these topics (plus an information section on the company and its environment). For its distribution, we have activated our network of professional contacts, reached new targets corresponding to the sought profile on Linked and through a mailing campaign, and distributed the questionnaire within professional networks/groups dedicated to supply chains and/or blockchain. At the date of submission of this extended abstract, we have about 30 respondents and the survey is still open (so we will have *more respondents for the final version of the article*).

The qualitative study is confirmatory and intended to explore more deeply by interviews the difficulties encountered by companies in implementing and using the blockchain in their activities. The interview guide includes 30 questions on these two topics (and information questions on the company and the respondent). The interviews have been conducted either physically on the occasion of meetings or thematic events related to supply chains and/or blockchain, or throughout phone or skype appointments. For the moment, we count 10 interviews but, as for the quantitative study, the survey is going on (so we will have *more interviewees for the final version of the article*).

All survey material can be provided upon request.

4 Summary of findings

The conducted *quantitative and qualitative studies are developed and discussed in the full version of this article.*

Regarding **RQ1 "What are the strategic issues at stake and operational uses of the blockchain in companies?"** It comes out from our quantitative survey that companies have implemented a blockchain mainly for reasons of transparency, traceability and security of information and transactions. For all these companies, the blockchain represents a(n important) competitive advantage in the market. Most of them use the blockchain in their logistics/production function, but some have also deployed it for other functions such as accounting/finance. Their *operational practices are detailed in the full version of this article.* Most of the participants in the survey have also deployed a favourable IT environment by combining the blockchain with other emerging technologies such as cloud computing, connected objects and/or IoT, big data and/or data-based predictive models, and artificial intelligence. A vast majority is...

(see the rest of this abstract, i.e. of our findings, conclusion, recommendations and the bibliography in the attached file)

Keywords: Blockchain, Chemnitz, difficulties, disruptive, implementation, innovation, operational practices, strategic issues, supply chain, technology

CONVERGING LOGICS? COOPETITIVE TIES AND INNOVATION IN THE EARLY CLEAN TRANSPORTATION INDUSTRY

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Introduction

Coopetition, the simultaneous pursuit of cooperation and competition (Bengtsson & Kock, 2000), is developing into a topic of growing relevance among practitioners as well as organizational and management scholars (Chen & Miller, 2012). This marks a major shift in thinking about inter-organizational relations as cooperation and competition have long been considered separate modes or 'logics' of interaction between organizations. Not only practitioners used to treat cooperation and competition as separate worlds, often dealt with by different organizational departments within a company. Competition and cooperation have also largely evolved in separate research streams dealing with *either* the one *or* the other, further establishing the suggestion that the two are distinct logics of organizing (Hoffmann, Lavie, Reuer, & Shipilov, 2018). In this paper, we analyze coopetition in the setting of the emergent, sustainability-oriented industry for clean transportation using the lens of institutional logics, i.e., the taken-for-granted rules of action, assumptions, and beliefs that govern organizational life and forms of interaction (Thornton & Ocasio, 1999). We argue that coopetition poses unique challenges as it involves what Greenwood and colleagues refer to as 'institutional complexity' (Greenwood, Magan Diaz, Li, & Cespedes Lorente, 2010; Greenwood, Raynard, Kodeih, Micellota, & Lounsbury, 2011), the challenge of having to deal with two seemingly incompatible behavioral modes or 'logics' – the logics of collaboration and competition.

Coopetition refers to inter-firm relationships in which firms collaborate with a direct competitor, that is, firms that operate in the same technology area and seek to invent and commercialize similar products and services (Bengtsson & Kock, 2000; Gnyawali & Park, 2009; Lechner, Soppe, & Dowling, 2016; Ritala, Kraus, & Bouncken, 2016). Recent examples include Toyota and General Motors joining forces in the development of hydrogen-powered cars or Tesla and Toyota on the supply of batteries to the Japanese car manufacturer. As these examples suggest, particularly in the context of developing novel technology for growing more sustainability-oriented industries,

*Speaker

cooperation among rivals is common. However, existing research has mainly explored coopetition in incumbent settings such as large multinational organizations or established industries (e.g., Walley, 2007), or on a case-by-case basis rather than on the level of an entire industry (for an exception, see Mathias, Huyghe, Frid, & Galoway, 2018). We thus lack an understanding of how coopetition affects entrepreneurial firms and their effort in creating a new, environmentally relevant market. New markets often hinge on entrants' technological innovations and their ability to attract financing for their risky endeavors. Given innovation and financing as key ingredients to developing new markets, we ask: *What effects do coopetitive inter-firm relationships have on startups' innovativeness and their ability to attract financing? What are the productive and unproductive tensions involved in coopetition and collaboration in the context of emergent sustainability-oriented markets?* We explore these questions through the lens of institutional complexity and draw on a sample of 287 startups and their inter-firm relationships in the emerging US clean transportation industry (2008-2012). Specifically, we elaborate on the unproductive and productive tensions involved in coopetition and disentangle the relevance of the partners' embeddedness in local clusters.

2. Research Design and Preliminary Results

We chose the emerging US clean transportation industry from 2008 to 2012 as our empirical setting. This industry comprises technology applications related to transportation issues in the areas of electric vehicles, fuel cells and hydrogen, biofuels and biochemical, energy storage and advanced materials. To test our hypotheses, we sampled all startups active in the US clean transportation industry (2008-2015). We constructed an unbalanced panel of 287 startups interacting with 472 firms from the U.S. and globally (847 relationships).

We measured our dependent variable innovation activity as the number of patent applications for startup i in year t. To measure the propensity of startups to attract financing, we used the number of annual financing deals that each startup acquired per year. The financing deals were collected and aggregated from the Thomson One, FactSet, and i3 Cleantech Group databases, and primarily encompassed VC funding at different stages (seed, series A, B, etc.) as well as other private investments (loans, bonds, etc.).

We considered our independent variable, i.e., a *coopetitive tie* if a startup partnered with another firm also being active in the same technology areas of the clean transportation industry. We classified relationships outside of the specific areas of the clean transportation industry as *collaborative relationships* with non-rivals. We further distinguished between partners that are insiders and outsiders to a local network. We collected the addresses of all 287 startups and their 472 partners using information provided by the i3 Cleantech Group, supplemented with information from the firms' webpages.

We controlled for the geographic location of each startup, as well as for the pre-sample patent and financing deals stock before 2008 to control for unobserved heterogeneity. In addition, we included fixed effects for year and for the various technological areas of the clean transportation industry. We measured firm size by the number of employees and age by including the time interval since the founding year.

In total, our analysis comprised 847 relationships, of which 513 were with direct competitors (coopetitive) and 334 with firms from other industries (collaborative relationships with non-competitors). We analyzed the data with negative binomial regressions for the count variables-patenting activity and financing deals-because of overdispersion and also included several robustness checks. The results for patenting activity indicate that coopetitive relationships increase patenting activity of the startups ($\beta = 0.133$, p-value $= 0.002$), whereas collaborative relation-

ships with non-rivals decrease patenting activity, although on a less significant level (β = - 0.098, p-value = 0.093). There is a stronger association for coopetitive partners that are outsiders to local clusters on patenting activity (β = 0.128, p-value = 0.018) when compared to coopetitive ties with insiders (n.s.). For the ability of startups to attract financial investments, our results indicate that collaborative relationships with non-competitors increase financial investments (β = 0.117, p-value = 0.009), whereas coopetitive relationships have no significant influence. Finally, there is a stronger association for relationships with non-competitors that are insiders to local clusters on financial investments (β = 0.352, p-value = 0.002) when compared to collaborative ties with outsiders (n.s.).

3. Discussion and Conclusion

Our paper provides novel contributions on the interplay between cooperation and competition by enriching work at the intersection of coopetition, institutional complexity, and the development of new, environmentally relevant markets. *First,* while coopetition has mostly been explored using a transaction cost economic or resource dependence perspective (e.g., Lechner et al., 2016; Quintana-Garcia & Benavides-Velasco, 2004), we introduce an institutional perspective on coopetition. In particular, we study coopetition in terms of institutional complexity (Greenwood et al., 2011), and explore how young firms operate facing the two seemingly incompatible behavioral logics of collaboration and competition. Our findings on the positive innovation impact of coopetitive ties and the negative impact of collaborative ties on the innovation activities of clean transportation startups further our understanding of the productive and unproductive tensions associated with logic complexity and coopetition, and address how and why (entrepreneurial) firms simultaneously compete and cooperate with each other - an enduring question in organizational studies (Bengtsson & Kock, 2000; Hoffmann et al., 2018). *Second,* our findings on the role of relationships with non-competitors for financial investments highlight the need to differentiate two cases: Whereas the tensions involved in coopetitive relationships may lead to increased innovation, the risk of knowledge outflows and opportunism seems to deter investors. Overall, these findings imply that investors still value the logic of collaboration with industry players that are non-rivals (Stuart, 2000; Islam, Fremeth, & Marcus, 2018). *Third,* we introduce the role of geographical unfolding and its implications for research on coopetition. Our results suggest that the importance of coopetitive ties for innovative activities is stronger when startups collaborate with competitors that operate outside of local clusters. But the contrary holds with regard to financial investments. These findings contribute to recent calls to study how firms obtain cluster benefits through new strategies (such as coopetition) despite the encountered risks (Ryu, McCann, & Reuer, 2018). *Fourth,* our analysis of the multifaceted forms of interorganizational relations and their impact during times of industry emergence add to recent research on how environmentally relevant industries emerge and grow (e.g., Sine & Lee, 2009; York, Hargrave, & Pacheco, 2016; York, Vedula, & Lenox 2018).

Furthermore, our findings have important implications for practitioners. The technological trend of digitization is pushing managers to focus on joint orchestration, also in the form of coopetition, to deal with challenges of more diffused innovation boundaries (e.g., Nambisan, Lyytinen, Majchrzak, & Song, 2017). Thus, our findings help practitioners who require recommendations about when engaging in coopetitive relationships can be beneficial: Coopetitive ties, especially with competitors that operate outside of local clusters, are important when seeking to increase innovation. On the contrary, when seeking to acquire financial investments, it might be more beneficial for startups to cooperate with non-rivals, especially with those that operate within local clusters.

Keywords: Coopetition, institutional complexity, innovation, clean transportation

A Collective Green Creativity and Eco-Innovation Framework to drive collaborative problem-solving processes amongst stakeholders

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What is the problem?
Our planet is in crisis. Global climate change is accelerating in severity and the physical signs and socio-economic impacts can be felt globally (World Meteorological Organization (WMO), 2019). The latest Climate Change Report shared at the U.N. Climate Summit (21-23 September 2019) added that climate change challenges are more severe and advanced than expected. This is evident in the increased ocean heat and acidity, increased wildfires, shrinking ice, rising sea levels, and the extinction of various species daily. Based on the evidence it seems that Kolbert's (2014) view that we are heading for a mass extinction event (the Sixth Extinction) caused solely by mankind is becoming more likely than previously thought. Greta Thunberg, a sixteen-year-old climate activist, stated the urgency for action to be taken in her speech at the U.N. climate summit on September 23, 2019. Thunberg stated, *"People are dying and dying ecosystems are collapsing. We are at the beginning of a mass extinction... For more than 30 years, science has been crystal clear. How dare you continue to look away and come here saying that you're doing enough when the politics and solutions needed are still nowhere in sight."(CBS News, 2019:1).*One of the challenges we are facing regarding our planet is the diverse views of the different global stakeholders and the complex nature of finding solutions to combat climate change. Some stakeholders are taking the warnings and evidence regarding change and extreme events, and finally a mass extinction event very seriously. Then, there are the stakeholders who ignore the warnings and signs and most even deny that climate change exists. For them, the long-term survival of humanity is less important than growing the economy, creating jobs, protecting the status quo and making money. Then there are the stakeholders that realize the importance of immediate action, but either lack motivation to change how they live and work, or they do not know what to do or where to start to make a difference. If people do not have a shared understanding of the impact of climate change on the planet and our survival, identifying ways to minimize the impact of climate change will remain difficult and too slow to turn things around. Yet, people can work together if all are willing and motivated to share their creative ideas.

Why is it important to collaborate, share green creative ideas and encourage disruptive eco-innovation?

*Speaker

Collaborative actions focusing on saving the planet with new, novel and disruptive ideas and innovation might be humanity's only chance to prevent the sixth extinction from happening. Catmull (2008 cited in Bridges, 2016:9) explains, *"Creativity involves a large number of people from different disciplines working effectively together to solve a great many problems".* Lynton (2016 cited in Bridges, 2016) confirms that creativity involves people to make things happen and that collaboration leads to novel ideas. Creativity is valuable if people work together, share their diverse knowledge, experiences, imagination, ideas, feel free to collaborate and debate their collective outputs. Hargadom and Bechky (2006) state that collective creativity reflects a qualitative shift like the creative process whereby the generation of creative solutions is drawn from past experiences of participants in ways that lead to new and valuable insights. Advances in technology, like open-source, peer-to-peer (P2P), Web 2.0 and virtual communities (Albors, Ramos & Hervas, 2008); as well as dissociation, a process that combines unrelated ideas, stimulates collective creativity more and this can lead to more culturally relevant results (Sanders, 2001). Richer ideas to solving problems can then be generated from various cultural diverse backgrounds and experiences if collective creativity is encouraged, developed and supported in organisations. Green creativity refers to the development of new ideas about green products, green services, green processes, or green practices (Chen, Chang, Lin, Lai & Wang, 2016). Eco-innovation is involved in the development of products and processes that contribute to sustainable development and applying the commercial application of knowledge to elicit ecological improvements (OECD, 2009). Therefore, green creativity to generate ideas can be linked to finding new environmentally friendly ideas and disruptive eco-innovation that will have a positive impact on the planet and climate change specifically.

What did you do?

This paper aimed to develop and propose a practical framework that can be used by stakeholders to generate novel green creative ideas collectively in efforts to minimize the negative impact of climate change on the planet through disruptive eco-innovation. To achieve this aim, the author qualitatively summarized the characteristics, requirements, tools, digital technologies and developmental methods to collect and interpret studies and secondary data. Based on the findings, a conceptual framework was developed that can be practically implemented to generate sustainable solutions that can benefit the planet and help in the fight against climate change.

What did you find?

Collective green creativity and eco-innovation can create sustainable business practices (Fields & Atiku, 2017). The process starts with the creative individual, which needs creative thinking skills, creative motivation, green mindfulness and green self-efficacy. A creative collective is then created using their creative intelligence and creative exchange to create a shared green vision. The creative collective requires green transformational leadership with access to green dynamic capabilities and resources to be effective. This creative collective follows the creative problem-solving process, which enables the collective to create eco-innovation that can be disruptive or incremental.

What do you recommend?

A framework is proposed that can be used to generate green creative ideas and eco-innovation to help minimize the negative impact of climate change on the planet.

The framework consists of three phases.

Phase 1 identifies the creative potential of the individual stakeholders and the creative collective (all the stakeholders together). This phase takes place before actual collaboration and collective creativity amongst stakeholder take place and can take a few days to complete.

Phase 2 consists of the actual creative process and collective problem-solving process focusing on green creativity. Ideas are generated to solve climate change problems specifically. The complexity of the problem/s and the novelty and value of the generated ideas determine how long this process will take.

Phase 3 consists of the evaluation of the green ideas and turning these ideas into eco-innovation. The stakeholders will have to invest time, expertise and funds to ensure eco-innovation is the final output and is disruptive in efforts to save the planet.
Phase 1: The framework starts by exploring the motives and skills of each stakeholder who forms part of the creative collective and identifies the level of creativity of the individual. Tools, digital technologies and developmental steps are available to determine the stakeholder's creative thinking skills, his/her motivation to be creative, the level of green mindfulness and green self-efficacy in a practical way. After exploring the individual's creativity, the focus moves to the creative collective (including all the stakeholders). The collective creative intelligence is then determined and developed. Methods to exchange creative ideas are then identified, discussed and implemented to ensure that no creative exchange gets lost. The diversity of the creative collective is then determined and any shortfall noted. For example, there might be too many white males in the creative collective and not enough diversity. Steps should then be taken to enhance the diversity intelligence of the creative collective. The same applies to the capabilities and leadership in the creative collective. The focus will also be on knowledge, experience and expertise in green and sustainable initiatives, how well the collective creative can work together and transformational leadership. The creative collective should also develop a shared vision and understanding of the creative collective's role and the impact that they want to make on minimizing climate change. Constant learning, development, sharing, trust and teamwork should be encouraged.

Phase 2: This phase is where the creative problem-solving processes take place and consist of four broad focus areas namely Understanding, Ideation, Analysis and Direction, each with its own input, process and output. Here ideas are generated to solve the complex issues around climate change. Practical tools, digital technologies and developmental tools and measures are recommended to enhance collective creativity and problem-solving. The best creative ideas are identified for possible further development and commercialization and are tested using the Ten Question Novelty Test before the ideas move to phase 3.

Phase 3: The best ideas are then implemented using a four-step innovation process. The first step is to determine if the idea can be developed into a product or process that adds value, the viability of the product or process is then tested to ensure that commercialisation can take place. The impact of the eco-innovation is then tested after implementation to determine if it helped in the fight against climate change.
What makes the conceptual framework different is that it offers practical tools and methods adopted from various creativity experts as well as the author's own research to achieve successful outcomes in all three phases. It is therefore not only a theoretical tool but a practical tool to enhance collaboration.

Keywords: Climate change, collaboration, creativity, eco, innovation, framework, ideas, green creativity, problem, solving, sixth extinction, solutions

Gamification & Ideation - An empirical Analysis

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What is the problem?
Gamification is said to enhance the ideation process of innovation, what is highly demanded to deal with actual challenges, but science lacks evidence about if there is causality and if so how.

The integration of gamification, or game design elements, into innovation, has been identified as an interesting avenue of research and from practical viewpoints, too. In particular, the benefits of gamification in ideation are seen as a gap in the existing literature (Agoguè et al. 2015). While gamification in other areas, such as education or health, has already generated a fair amount of research with positive and mixed results (Seaborn & Fels 2015). Further, the usefulness and effectiveness of specific game design elements, such as points and leaderboards require research as well as their comparison with control groups (Patricio et al. 2017).

Why is this important?

Knowing causalities between gamification (elements) and ideation (success) will contribute to the process of innovation. On one hand the organization could benefit from a better exploration, problem-solving, and collaboration. On the other hand, the individuals within the process could experience more engagement, better workshops, and behavior changes.

In order to generate innovative and creative ideas, it is important to acknowledge that they cannot be achieved mechanically but rather require stimulation through creating a framework to bring them to the surface (Procopie et al. 2015). If there is a successful application of gamification as a tool, it opens up the possibility to engage a specific target group towards a performance that promotes exploration, problem-solving, and collaboration.

Deterding et al. (2011) defined gamification as "the use of game design elements in non-game contexts (p.2)." For the authors, gamification aims to create a gameful experience in an environment that is not part of a game to promote user engagement, user experience, and behavior

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change. It is essential that the participants get a set of rules, goals, and tools to successfully apply gamification (Kalinauskas 2014). The introduction of gamification elements into workshop concepts offers one possibility to enhance ideation process with more efficiency due to the motivating and engaging aspects, that gamification brings to the surface.

What did you do?

This quantitative study is set in the automotive sector and explores the use of gamification in a ideation workshop setting. Therein, the study wants to answer the following research question: does the use of game design elements enhance the workshops in an industrial environment, especially in regards to idea quality and workshop experience?

For this, the study selects points and leaderboards as game elements that are tested throughout six workshops that only differ through the use of gamification. There are two workshops with a control group without gamification elements, two groups that only know their ranking at the end of the workshop, and two groups that are aware at all times of how many points they were able to collect.

There are three hypotheses through which this study wishes to answer the research question. Each tries to examine a different "level" of gamification and its application in the practical workshop setting. The first hypothesis regards itself with the workshop output, the generated ideas. It is the hope that through the introduction of gamification into the workshops, the participants are triggered to generate better ideas. Roth et al. (2015) found that the use of gamification leads to an increase in idea quality. The gamified elements, such as points and leaderboards, act as incentives that ideally improve the quality of output. Therefore, the first proposed hypothesis is: *Gamification positively influences the idea quality within the idea generation workshops.*

The second hypothesis regards itself with the experience that the participants have while they take part at an ideation workshop. With this, the study aims at evaluating other potential outcomes from gamification, hedonic aspects (Patricio et al. 2017). Those are the motivating and engaging factors that gamification brings through immediate feedback and other gamification elements. Groh (2012) specifically looks at the concept of flow in connection with gamification and finds that even to fail is desired as it improves the experience of succeeding afterward. Through a gamified workshop, participants may be encouraged to be in a higher state of flow than during a non-gamified workshop (Kalinauskas 2014), which in turn leads to higher engagement. Therefore, the second proposed hypothesis is: *Gamification positively influences the participants' workshop experience.*

The third proposed hypothesis regards itself with the competition between the participants. Games can support either competition or collaboration (Procopie et al. 2015; Hung 2017). Patricio et al. (2017) especially mention potential collaborative outcomes of gamification in the early stages of the innovation process, due to increasing team spirit and establishing the feeling of creating knowledge together. As this workshop uses points and leaderboards, the setting is designed for competition, rather than collaboration (de Byl 2013). Through this hypothesis, the study may be able to deliver insights into the question whether or not a competitive setting is beneficial. The third hypothesis is: *Gamification positively influences the competition between the participants.*

To be able to find support for the proposed hypotheses data was collected during six ideation workshops, which lasted three hours each and used two different ideation techniques.

What did you find?

The workshops resulted in 108 participants (53% male, 47% female) and 164 generated ideas. Following the data collection, the hypotheses were tested by applying analysis of variance (ANOVA). For hypothesis 1 the ANOVA results in $F(2, 161)=1.048$, $p= .353$) finding no support for the first hypothesis.

The second hypothesis tests with $F(2, 104)=8.861$, $p< .001$. As the ANOVA shows a significant result a Bonferroni post-hoc test was conducted. It showed that the control group without gamification elements had a better workshop experience finding no support for hypothesis 2.

The result of the third hypothesis is $F(2, 1182)=12.653$, $p< 0.001$. The conducted Bonferroni test found support for the third hypothesis, showing that gamification as implemented in this study increases competition.

What do you recommend?

There are several potential explanations for the results of the study. One is that the competitive setting of the workshops are actually interfering with the aim of creating higher quality ideas. Blohm et al. (2011) found support that collaboration instead of competition enhances idea quality, while competition increases idea quantity (Bhagwatar 2013). Other potential explanations regarding the results are that there was little engagement and that the gamification elements are more of a distraction than a benefit to the cause or that the participants did not feel challenged enough (Hamari et al. 2016). Further, the participants could have been missing commitment to each other as well as to the cause resulting in them not giving their best (Patricio et al. 2017; Seaborn & Fels 2015). As described, many possible gamification elements can be used within a workshop. It is possible that the elements used in this study design were simply the wrong choice. Another explanation for the results is the short-term application during the three-hour workshops (Seabron & Fels 2015).

In conclusion, the answer to the research question has to be that gamification does not improve ideation workshops in a practical environment with special regards to idea quality or workshop experience. However, the data collected offers exciting insights, allows for statistical testing and future evaluation into the topic.

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Keywords: Gamification, Ideation, Workshops

Green Practices in South African Food Retailers

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The continued exploitation of natural resources, carbon emissions from operations by business entities and individuals in pursuance of profits continues to affect the earth negatively (Bhattacharya, Jain and Choudhary, 2011:6). A "green" concept was developed to protect the environment and preserve scarce natural resources (Bhattacharya et al., 2011:6). Various researchers regard "green" by using it interchangeably with terms like "organic", "eco-friendly" and "sustainable". The word "green" can represent products, systems and services that save energy; are made from renewable resources; are recyclable, all-natural, organic, environmentally friendly, durable, low maintenance, reusable, biodegradable, free from ozone-depleting substances; and gained from local resources and manufacturers (Punchee, 2011:2).
Bhattacharya et al. (2011:6) stated that "green" presents ecological sustainability and covers many different concerns, including air, water and land pollution, energy usage and efficiency, and waste generation, and recycling. "Green practice" as a concept interests many organisations since it affects the organisational image of economic, environmental and social aspects. Several factors compel many organisations to change towards a "green" corporate culture. Some of these factors are government regulations, customer demand, the increase in the cost of raw materials, and the cost of technology and fuel (Bhattacharya et al., 2011:8).

Green practice describes the implementation of environmentally friendly activities that have an impact on taking care of society's health and low-cost production and conserving natural resources for the coming generation (Claro, Neto and Claro, 2013:365). A sizeable number of consumers nowadays seek to reward businesses that have a green focus (Guyader, Ottosson, & Witell, 2017). Such consumers have an awareness of the consequences of their consumption and will patronise environmentally friendly and fair trade food retailers (Guyader et al., 2017). Consumers reveal their green attitudes through their shopping behaviours (Guyader et al., 2017). Consumers are willing and prepared to pay more for green products (Guyader et al., 2017).

The green and organic food sector have experienced rapid growth on a global scale, particularly in emerging economies such as India, China and South Africa. The development of such markets requires the intense scrutiny of the credibility of such retailers (Kumar & Polonsky, 2019).

Failing to deliver on green practices, retailers may face difficulties such as low market share, high production costs, reputational damage, losing customers, being out of competition, and government intervention (fines, higher tax rates) (Ayoub and Juji, 2012:195). Bertels, Papania

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and Papania, 2010:6) state that greening organisational practices enable business longevity because implementing this strategy supports healthy economic, social and environmental systems. As a result, food retailers are initiating and implementing green practices as a daily activity to ensure success in their business operations. However, to achieve this success, a comprehensive understanding of the factors influencing the adoption and the actual implementation of green practice are required.

Studies by various researchers have been conducted and reviewed to identify the factors influencing green practices in different business sectors. Claro et al. (2013) suggested the concept of "Sustainability drivers in food retail". These drivers were categorised into internal drivers (resource-based view, human resource, process capability, human resources capabilities, and customer drives capability); supplier relationship drivers (inter-organisational processes and policies, and supplier communication); and external drivers (uncertainty, competition and economy). Dhull and Narwal (2016) described the drivers of green practices as internal and external. The internal drivers included the "environmental mission of the organisation", ethical value of the organisation, employees' involvement or motivation and the desire to minimise costs.

Reddy (2016) described external drivers as government and policy regulation, suppliers, customers, market, competitors and society. According to Reddy (2016), management support, organisational structure, strategy and cost are considered as internal factors of green practices.

Naidoo and Gasparatos (2018) also mentioned factors affecting green practice. These factors were profitability, environmental policy and stakeholder pressure. However, there is no conclusive research on factors influencing green practices in retail food stores. Moreover, there is no research done on South African food retailers. Thus, this study set out to analyse factors influencing green practices amongst South African food retailers.

Furthermore, since the factors are related to social, economic and regulatory policies, different food retailers located in various places may experience different factors initiating green practices. To mention a few, it could depend on the type of customers (Dabija, Bejan and Grant, 2018:174), types of suppliers (Naidoo and Gasparatos, 2018:126), customers' purchasing power (Dabija et al., 2018:174) and the force of rules and regulations intervention (Dhull and Narwal, 2016:65). Thus, there is a need to understand and analyse factors influencing green practices amongst South African food retailers.

Many organisations are aware of the environmental sustainability concept and its importance in the success of a business. However, many organisations are yet to introduce sustainability measures at their workplaces (Naidoo and Gasparatos, 2018:126). High-energy consumption, resource wastage and production costs exist, as well as reprocessing and inefficient utilisation of resources and similar activities. Because of some hindrances, many organisations are discouraged from implementing green practices at their workplaces.

Green practice at a retail level plays a crucial role in changing market bases and the business world into a sustainable business activity. Firms such as food retailers play an essential role through their green practices such as the reduction of pollution, efficient resource use, improved stakeholder relationships in ensuring economic progress towards sustainability (Islam, Tseng, & Karia, 2019).

There is a growing body of research assessing sustainability practices by organisations (Islam et al., 2019). The study aims to identify the factors influencing green practices in the food retail sector and to what extent it executes green practices in its daily business activities.

Therefore, this study analysed the data and identified the factors influencing green practices of the food retail sector in South Africa and the extent to which it practices green in its daily business operation.

The study adopted a mixed-methods research approach. Eight retail food stores participated in the study. The primary data was gathered employing face-to-face interviews with 23 managers and personally administered questionnaires distributed to 105 employees from which full responses were attained. A purposive sampling technique was used to select managers and employees. Content analysis was adopted to analyse the qualitative data and SPSS for descriptive statistics as well as univariate regression analysis to understand the relationship between the different variables. As per the objectives of the study, that is to identify the influencing factors and determine the level of green practices in the South African food retail sector, the findings of the study showed that different driving factors lead the food retail sector to implement green practices. There are also differences in the degree of implementation of green practices. The empirical data suggested that the dependent variable, namely the employee initiative to perform green practice, is significantly influenced by the independent variables. Despite the smaller sample size and limited geographic distribution due to logistical constraints, the study provides enough evidence to the progress made and in the limitations that exist within the food retail sector when it comes to the promotion and implementation of green practices. This study provides insights into future green practice research by retail organisations.

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Keywords: Sustainability, Green Practices, Food Retailers, Ecological

POCHEN - Biennale for multimedia art

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ARTEM OCC 2020 - Call for papers We hereby apply with the project POCHEN - Biennale für multimediale Kunst for a participation and presentation of our project in the context of ARTEM.

POCHEN is an attempt to enrich the city of Chemnitz with a new art exhibition format. In a 2 year cycle we want to make a creative contribution to the art landscape of Chemnitz. And the success of the exhibition debut of the POCHEN Biennale 2018 proves us right: people discussed and reflected. The spark was lit - POCHEN was born.
Like hardly any other European city, Chemnitz reveals Europe‘s need for new narratives. The city of Chemnitz needs powerful answers from its citizens to the right-wing extremist riots in August 2018: With the questions, who we are, where we come from and what shapes and inspires us, we want to contribute. Multimedia art should be a vehichle to stimulate discussion and reflection here.
Especially regarding the application for the European Capital of Culture 2025, we want to give the city of Chemnitz a new face: As a city that confronts its past and present, and as a city that is open to the future.
As a multimedia exhibition format, the POCHEN Biennale tells history and stories about the past, present and future. Every two years, POCHEN wants to bring together multimedia forms of expression in art with the themes that sustainably move people in the region and in Germany. With POCHEN Biennale 2020 we want to build on the exhibition debut in 2018. So, we want to expand the concept of Festival further: As part of the POCHEN Symposium, we want to bring together representatives of European art festivals and artists with network partners and top performers from the fields of art, science, technology and society in order to think ahead with the POCHEN Biennale. Internal as well as public events await us for this purpose: Lectures, workshops, exhibitions and explorations should encourage us to exchange ideas and inspire the upcoming POCHEN Biennale 2020.

You can find more information about POCHEN here:

www.spinnerei-verein.de
www.pochen.eu
https://web.facebook.com/pochenbiennale

Vimeo
https://vimeo.com/328438120

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Youtube
https://www.youtube.com/watch?v=gAjYcdK48e0&feature=youtu.be

For the ARTEM Conference 2020 we are pleased to present and discuss POCHEN in form of a presentation and with the integration of an artistic example our project approach.

The interdisciplinary approach is intended to produce future-oriented, innovative action and solution strategies for societal problems. In addition to the investigation of current social change, in particular those that express themselves in connection with historical and current upheavals, such as the Wende 1990" or current "Digitalisation", the creative work of the artists will be used to stimulate and find future options for action in exchange with the visitors.

The city of Chemnitz is the research laboratory for this process: regionally strongly anchored themes, which have virtually burned themselves into the collective memory of the city and the new federal states in East-Germany, are to be broken open up and processed. Accordingly, we see the POCHEN Biennale as an instrument to stimulate social discourse in and with art.
In order to fully process the annual theme for and with the public, the theme will be related to various implementation and mediation formats and their interactions will be brought into focus:

Educational and networking trips
Happenings & Events
biennial
Symposium (Workshop, Lecture, Performance & Community)

Possible presentations of artistic positions within the scope of our presentation:

Presentation of one or more young, artistic positions of our project partner: the art class with a focus on digital and time-based media of the HFBK Dresden with Prof. Carsten Nicolai
Presentation of photographs by Falk Haberkorn & Sven Johne that have explored the historical legacy of the "Treuhandanstalt", which is our topic focus for 2020

In the appendix you will find a photo documentation of the exhibition 2018, the digital program brochure of the symposium 2019, as well as an image file of the project.

If you have any questions, please do not hesitate to contact us under the following contact details:

POCHEN - Symposium a project of the Spinnerei e.V.Project managerBenjamin Gruner Tel: +49 / 176 / 72284712
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Keywords: art / identity / region / Chemnitz / technique / no future without a past / society

Application and Validation of a Disruptive Potential Methodology for Digital Two-Sided Platforms – The Case of Peer-To-Peer Lending in Germany

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As an increasingly growing scholar base is researching in the topic of disruptive innovations, but mostly in the ex-post perspective. An ex-ante analysis is crucial to respond early to potential disruptive innovations from an incumbent perspective and creating them in a most effective way from an entrant perspective. Although, recently more research on disruptive innovation theory was done from an ex-ante perspective, an evaluated methodical framework for an improved prescriptive capability especially in the digital platform economy is largely missing [Christensen et al. (2018)]. Since the appearance of disruptive innovation theory in 1997 [Christensen (1997)], new phenomena and concepts have emerged in the innovation area, such as "platform economy", "sharing economy" and "collaborative consumption models" [Kenney and Zysman (2015); Venkatraman et al. (2014); Belk (2014); Botsman and Rogers (2010); Eckhardt and Bardhi (2015)]. These new economic or business models were enabled through digitalization – with the increased potential of information technology [Clemons et al. (2017); Nambisan et al. (2017)]. These new business models are often implemented on digital platforms that have a specific character of two-sided markets with two different user groups and different network effects [Parker and van Alstyne (2005)]. For the analysis of the disruptive potential, this means that both sides of a digital platform could exhibit different levels of disruptive potential. In this paper, we address the question if and how these new properties of digital platforms need to be considered in the analysis of the overall disruptive potential. Therefore, we also follow the calls of scholars such as Danneels [2004; 2006], Kaltenecker et al. [2013] or Christensen [2006] and Christensen et al. [2004] for more ex-ante studies to test and further develop the disruptive innovation theory by better understanding its potential boundary conditions.
In search of a suitable case, we identified a potential disruptive phenomenon in the banking industry that fits to our desire to validate an ex-ante disruption method: The emerging peer-to-peer lending marketplaces in the retail banking business. Since the onset of the financial and banking crisis in 2007, banks are facing ever-expanding challenges. Government bailouts, financial fraud, unethical banking practices, lack of transparence and the sovereign debt crisis, motivate the bank customers also to avoid established intermediaries such as banks or govern-

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ment agencies [Frerichs and Schuhmann (2008)]. This loss of customer confidence fuels increasing interest in new lending and investment opportunities or alternative financial institutions [Vater et al. (2012)]. Individuals are more and more used to take part in dissemination of information and direct digital interaction. Bank customers also want an increasing user-centric digitization of its banking operations, but traditional banks usually follow only slowly. These trends seem to fuel the growth of peer-to-peer lending. Peer-to-peer lending offers an online-based transparent investment and granting of credits between individuals, emerged as one of these alternatives that have been established first in UK with "Zopa" in 2005 and in Germany since 2007 with platforms such as "smava" or "auxmoney". Due to different aspects of a disruptive innovation, peer-to-peer lending could have high disruptive potential for established banks, since they address the lower market segments of the established market or other customer groups with their initially lower performance, measured by the established performance attributes of the established companies.

In order to address these research and application challenges, we developed an improved theoretical approach to analyze the disruptive potential in digital two-sided. This framework was applied to the case of peer-to-peer lending marketplaces in Germany in two different points in time (2015 and 2019) to evaluate the framework from an ex-ante and ex-post perspective. As research strategy we followed a case studies approach since our case takes place within a real-life context, combine numerous data collection methods and sources and tend to focus on an in-depth understanding of the dynamics in a single setting [Yin (2009); Eisenhardt and Graebner (2007)].For this purpose, we identified and further developed the disruptive potential framework by Hüsig and Keller [2009] with extensions of Kaltenecker et al. [2013] and applied it to the case of peer-to-peer lending marketplaces in 2015. After four years, we now review our findings and predictions for validation purposes of the forecasting quality and for further development of the method. Our evaluation scheme is based on a catalogue of criteria rooted in disruptive innovation theory and relevant aspects of the internet economy such as network effects, which are explicitly taken into account. We follow Keller and Huesig [2009] with their structure of the framework and the disruption process in three phases (foothold market entry, main market entry, failure of incumbent), which shows the dynamics of the disruption process and its possible variations of the disruptive potential in each phase. The consideration of a two-sided market marketplace causes us, to double the modified Keller-Huesig-framework in order to capture the disruptive potential of both sides. This approach increases the complexity of the analysis. In order to support the interpretation of the results and to simplify the application of the method, we suggest quantifying the disruptive potential as further step towards an operationalization of the concept in percentage values. Validating the method, we compare the key results of the ex-ante framework with data from 2015 and 2019 in order to assess the forecasting potential of the chosen method.

Our analysis shows that the investment and credit business of retail banking sector needs to be addressed as a two-sided market business model with varying disruptive potential on each market side, for each (group of) players and for the different disruption phases. The credit market side shows a higher disruptive potential for the German retail banks in total, but this side cannot be seen isolated from the investment side – both sides are needed for a peer-to-peer lending business. The more peer-to-peer loans are demanded by overshoot customers at the low-end of the main market and by non-consumers. The more the lending process technology of the lending platforms improves, the higher gets the security for investors due to decreasing default rates. Therefore, more investors of other classic investment segments from the main market of the incumbent retail banking business with more risk aversion will participate on peer-to-peer lending marketplaces. Lesser risk and more capital supply might also lead to falling interests that will motivate customers of higher (mainstream) segments to loan a credit on this marketplaces that captures more business from the incumbents. Precisely in this direction the market

has developed over the past four years.

Our results for the incumbents indicate inter alia that branch banks are most affected in the foothold market entry phase at credit and investment market side by fulfilling all of the criteria for a high disruptive potential. That is because peer-to-peer lending marketplaces address customers, who are currently not in their strategic priority or noncustomers and the peer-to-peer lending business sub-market with its business model seems unattractive. The main market entry and the failure of branch banks is more conceivable at the credit market side, but currently unlikely for both market sides. However, an own initiative in the sense of a spin-off that builds an own peer-to-peer lending marketplace or an acquisition or cooperation could help the incumbents to cope with this disruptive potential. For this reason, in the meantime more and more banks are participating in FinTechs or trying their hand at their own greenfield solutions [Springer Professional (2019); Finanz-Szene (2018a); Emerging Europe (2019)].

In 2015 also the main entrants in German retail banking market "smava" and "auxmoney" showed a higher disruptive potential on the credit than on the investment market side – mainly auxmoney. In April 2019 auxmoney already recorded the credit volume of a medium-sized savings bank [GeldDigital (2019)]. In the same month, auxmoney expanded its business model to include offers for corporate loans, what opens up to a new customer class. They are thus on the threshold of the main market and clearly entering the business of direct banks and branch banks. [Finanz-Szene (2018b)]. Smava in contrast has completely geared its business model to credit brokerage. From July 2019, peer-to-peer investments will no longer be possible at smava itself. As indicated by its higher disruptive potential in 2015, the framework correctly predicted the entrants' performance of Auxmoney.
The results show, that the modified ex-ante framework of Keller and Huesig [2009] is an appropriate method for identifying a disruptive potential in digital two-sided markets, illustrated in the case of peer-to-peer lending. Other approaches such as Christensen et al. [2004], Keller and Huesig [2009], Klenner et al. [2013] or Guo et al [2018] have not been explicitly tested in the case of in digital two-sided markets. We recommend further validating and developing this method in other areas of ex-ante disruptive innovation research, especially in cases of in digital two-sided markets. The importance of crypto currencies for classical payment transactions or blockchain technology could be an interesting area for future research.

Keywords: Disruptive Potential, disruptive innovations, Digital Two, Sided Platforms, Peer, To, Peer Lending, FinTech

A teaching case evaluation - Wind gas technology within the technological innovation system

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Climate change is becoming one of humanity's biggest issues at an alarming pace (IPCC, 2018). As the debate about how to avert a climate disaster is getting more intense both in scientific circles as well as in society and even at the political level (bpb, 2019), new technologies and solutions are needed due to the increasing shift from fossil fuels to renewable energy sources. This results in an urgency for electricity from renewable energy sources needing to be stored to bridge the gap at times with no renewable electricity infeed (DVGW, 2019). In 2011, Prof. Sterner in collaboration with Greenpeace Energy, coined the term "wind gas" which is often used as a synonym for power to gas. Wind gas is a technology in which a fuel gas is produced using water electrolysis, which is operated with renewable electricity, mainly wind power. The gas can be stored and later be used for various purposes (Greenpeace Energy, 2011). In the same year, Greenpeace Energy launched the first ecogas tariff "proWindgas", which supplies customers with climate-friendly wind gas blended with natural gas. These actions made power to gas, which has previously been known primarily to experts and scientists, a more common term to the public. Despite the successful market launch of "proWindgas", Greenpeace Energy has not become a serious competitor on the German gas market yet (Statista, 2019). This seems surprising, since wind gas can play a key role in battling climate change, offering numerous advantages (dena, 2016). The technology's future potential in terms of cost degression and increased efficiency, for example, is assessed very positively by the majority of experts. In addition, the technical feasibility of wind gas has already been proven successfully in over 30 pilot applications in Germany (Zukunft Erdgas, 2017). So why are there still so many obstacles to overcome, if the German Federal Government has set itself the goal of climate protection and indicates the so called *Energiewende* as a driver for innovation and modernisation? (bmwi, 2019)

In order to explain why wind gas is not used by companies in the heating sector despite its numerous advantages, Hartenstein and Saure (2019) developed a teaching case, which uses the theory of the technological innovation system (TIS) as well as innovation barriers and innovation promoters for a comprehensive analysis. With the help of these theories, actors or institutions which inhibit or support the wind gas technology were identified with the aim to provide a deeper insight into the topic. Then, the results of the study were formulated as part of a term paper and subsequently processed as a teaching case. Since, as a result of a volume limitation,

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the named teaching case was not evaluated (Hartenstein and Saure, 2019), this paper aims to evaluate the teaching case in both qualitative as well as quantitative manners. The assessment will be conducted under the following research question: *How can the teaching case, developed by Hartenstein and Saure in 2019, be evaluated and improved so that it can be used in the education department at the best possible standard?*

The aim is to design a teaching case that can raise awareness for the topic, be introduced to students, and indicate how complex real-life situations can be captured with theory. So how does the theory of the TIS look like in reality? Which interdependencies can be found between certain agents? What barriers and obstacles are out there and how can they be tackled according to recent promoter/opponent theory? It also makes students ask, what society can do. The teaching case is designed to make them deal with the topic and come up with their own ideas and action plans. Thus, creating a teaching case about this topic assists the whole process of spreading knowledge and awareness about the wind gas technology and its advantages for fulfilling the Energiewende. To accomplish these objectives, the teaching case must be well written, focused, easy to understand but also challenging (Gill, 2011). The first version of the teaching case written by Hartenstein and Saure (2019) has to be proven to be of a certain quality level yet. The evaluation of the teaching case is conducted to ensure these requirements.

Both quantitative and qualitative evaluation methods were used to assess the teaching case This improves the validity of the research results, since distortion of results and systematic errors are limited by using different methods (Norman, 1991). To ensure that the target group will be met, only students from Chemnitz University of Technology who are enrolled in the master's programme *Management and Organisation Studies* and who participate in the lecture *Innovation und Beratung* will be selected for this case's data collection. For the quantitative data collection, a questionnaire is applied, which the participants are asked to independently fill out. In the first part, the overall quality of the teaching case and its individual components is assessed. The second part contains open questions for indicating suggestions for improvement. The number of participating students is yet to be assessed, but all students attending the class *Innovation und Beratung* will be asked to participate. The qualitative evaluation of the teaching case will be conducted in the form of interviews and a group discussion. On the one hand, the content of the case will be reviewed, with the participants exchanging their proposed solutions in a moderated discussion round. Furthermore, general quality criteria such as reading fluency will be queried in form of interviews. In addition, suggestions for improvement, criticism and additions by the participants will be an important part of the qualitative evaluation.

As this paper is still labeled as "work in progress", no statement about possible results can be offered yet. Nevertheless, the contribution at the ARTEM conference in march 2020 will most likely consist of a presentation about the work, design, obstacles and results of this paper.

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Keywords: wind gas, power to gas, technological innovation system, innovation barriers, innovation promoters, Greenpeace Energy, renewable energy, Energiewende

How do shared mental models foster team creativity? A team level analysis of drivers of ideation in the team creativity process of innovation teams.

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Companies that have their fingers on the pulse of time must act quickly and innovate current products and services continuously. To innovate complex products and services or to solve new and complex problems, one person is not enough anymore. Innovations are created by teams (de Vreede et al. 2017). To act quickly and to be one step ahead of the competition, interdisciplinary teams are needed (de Vreede et al. 2017) for proactive and fast decision making in the interdisciplinary and complex world of innovation. Such a team consists of individual members that need to cooperate to solve problems, to find and realize solutions and to develop new products (e.g. services, complex innovations). The members of such a team need a shared understanding of the different requirements of the task- and work coordination (Santos et al. 2015; Maynard & Gilson 2014) to foster their team effectiveness. This shared understanding is indicated as team knowledge regarding the usual interactions and work methods within the team and got labeled as shared mental models by Cannon-Bowers, Salas & Converse (1993). Mental models are subconsciously, unconsciously or consciously representations of the world around, like events, objects, actions and relationships (Haun 2002). Shared mental models have a positive influence on team performance. The team members share the understanding on how information around and within the team should be interpreted. This enables them to make predictions and decisions at a faster pace and thus achieve their objectives earlier (Cannon-Bowers et al. 1995; Maynard & Gilson 2014, Santos et al 2015). Teams generate more creative ideas than one individual does alone (Mumford et al 2001) but team creativity is not the subsumed individual creativity of the team members (Woodman et al 1993). It is necessary to take a closer look at the factors that foster team creativity on the team level. Understanding how team creativity gets stimulated is expected to create opportunities to improve the efficiency of innovation and r&d processes and enhance collaborative creative work by increasing the innovativeness of innovations and r&d teams and saving organizational resources, which in turn increase the competitiveness of the organization (Cannon-Bowers et al. 1995).
Factors that foster team creativity have been researched over the last decades, like team size and team cohesion (Hülsheger et al. 2009). The meta-study of Santos, Uitdewilligen & Passos (2015) lined out that most studies on that matter focus their investigation on the individual level of team members and their influence on team processes (Santos et al. 2015). However,

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research on the influence of shared mental models on team creativity is rare and has not been conducted in detail yet (Santos et al. 2015). These studies clearly show that shared mental models have a positive effect on the adaptability of teams, which is a precondition for creativity and innovation (Santos et al. 2015). The construct team creativity is a result of the individual creative behavior, the interactions between the team members, the team characteristics, the team process and the contextual influences (Woodman et al. 1993). To understand which factors of shared mental models influence team creativity, it is necessary to investigate the process of collaborative creative work on the team level. Accordingly, the research question of this article is: How do shared mental models influence the ideation of innovation teams?

This study aims to investigate and to understand how shared mental models foster or hinder the emergence of team creativity. The results are expected to help improve the innovativeness of teams. Therefore, a study with a mixed-method design is compiled (Grecu & Völcker 2018; Kuckartz 2014), with a focus on qualitative research (Kelle 2014) to develop the understanding of how shared mental models influence team creativity. The data was collected during a simulation of problem-solving with creativity techniques embedded in a lecture on innovation and consultation at the Chemnitz University of Technology. The simulation focused on the practical use of creative techniques to identify and solve a real-world problem in a given timeframe. All students had to work in teams and all teams got the same task, except one team, in which the members had to work separately most of the time, they were only allowed to work as a team for the last ten minutes. For task solving every team got a different creativity technique. The empirical design consisted of five phases of data collection accompanying the described course: At first, all students had to fill in a questionnaire to collect their individual data like age, bachelor's degree course, and second items that testing individual mental models, like individual credibility and individual task coordination. In the second step, two teams were observed, the already mentioned one, that was only allowed to engage in actual teamwork for the last ten minutes of the simulation and one of the other teams that engaged in collaborative work for the whole simulation. In the third step, all teams had to present their results – the identified problems, generating ideas and solutions. They also had to rank these solutions and reason their decisions. These results were used to rate their innovative capability. At last, a second questionnaire was filled in, composed of items testing for constructs of individual and team satisfaction, individual and team credibility, knowledge coordination and team reflection. The final step was a group discussion with each of the observed teams about their teamwork during the simulation, which has been recorded and transcribed.

This study uses a multi-methodical field approach, a mixed-methods design. For the aim of this study, it is necessary to combine quantitative with qualitative methods to investigate the object of research from different perspectives. By combining both methods, it is possible to reduce the disadvantages of each method, capture and understand the object of research better and in turn enhance the causation and reliability of this study (Grecu & Völcker 2018). At this time, the theoretical and methodical baselines for research are chosen and the data is collected. The next steps are the preparation, analysis, and interpretation of the data. The different forms of collected data will be analyzed appropriately: for the two questionnaires statistical analyses will be used, the observation and the two group discussions will be analyzed and interpreted using the qualitative content analysis. In the final stage of this ongoing research project, the result is summarized and explicated, the influence of shared mental models on the ideation of innovation are presented and discussed.

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Keywords: team creativitiy, shared mental models, innovation teams

Research Project: Leadership in Growing Organization

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3

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What is the problem?
Experience und implicit knowledge about leadership and management

of growing organizations needs to be made explicit and well-grounded.

While organizations grow, they step through phases such as defined by Greiner. For each phase it is scientifically clear, what the problem, challenges and options are to go through and succeed as organization to reach the next level. But the process of going through each of the phases practically challenges every manager and team member differently. Moreover, it requires different behavior according to organizational function and sector.

For many years my consultancy accompanies organizations in growing processes. Throughout these projects we gained implicit knowledge about what managers should do and how organizations should act in different sectors in each of the growing phases. Thus, now we are in the process of transforming these implicit assumptions into explicit knowledge. Our aim is to ground our basis of knowledge about growing phases with a large number of practical cases to gather data on how to step through these stages successfully.

Our (research) question is: What do the managers or leaders of an organization or function within an organization need to master within each of the growing phases? Therefore, we are conceptualizing a research project at the moment because we would like to use scientific research methods to answer this question.

Why is it important?

Organizations could develop more focused and with less failure.

Organizations are an essential part of our society to create development. If it is known how

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leaders of organizations can manage their organizational growth they can get advised in this regard. This would ensure to realize success and growth of organizations in general. Especially, organizations in Saxony could benefit from these insights. Furthermore, a gathering of data based on a large number of would also allow to contribute to the theory of growing phases of organizations.

What did you do?

As an expert for leadership of growing organizations, I am collecting a lot of experience and implicit knowledge while accompanying organizations in their growth process and collected.

Through many years, we build an organization to practically deal with the topic of organizational growth. Especially leadership and management action within an organization is the focus of my daily work. According to the key points of an organization, the details about successful behavior to move on within a particular challenge, is focused within the consulting or training. The consulting process follows the idea of growth cycles. Hence, around this focus, experimental and implicit knowledge was collected regarding the content itself and about how to do it practically.

What did you find?

Organizations follow particular stages of growth but different sectors and functions in organizations require different action to manage the growth stages successfully.

Daily business differs according to the growth cycles and the function a manager is working in within an organization. The questions of how to do this successfully requires different answers according to sector, function, and growth stage. Although similarities are given due to the theory of organizational growth, the practical examples show the diversity of successful behavior and decisions by managers. The knowledge about the particular behavior is not analysed scientifically so far.

What do you recommend?

A grounding of implicit assumptions and knowledge about growing organization by a scientific longitudinal research design would improve the consulting process as well as the growth of an organization, and the enrich the theory of organizational growth.

In a first step, it is necessary to collect the implicit assumptions and knowledge from the consultants within a qualitative design such as expert interviews (Froschauer & Lueger, 2002; Trinczek, 2009) and group discussions (Lamnek, 2010). Based on a theoretical framework about growth cycles of organizations (L. Greiner, 1972; L. E. Greiner, 1998), the insights from the interviews will form a foundation for the documentation of future consulting cases.

In a second step, the collection of cases and the documentation of their consultant projects and growth processes will deliver data. The data will serve as a base to improve the consulting process and thus the growth of organizations. This will take place within a case study research design (Eisenhardt, 1989; Yin, 1981, 2013). Over time, first results could be a multiple case-study as a qualitative description of successful behavior in different growth stages, various

industries, and different functions of an organization.

But in a long run (10 years), and with a large number of cases it may become possible to create a quantitative study what could lead to general insights. With these insights it may become possible to contribute to the theory of growth cycles.

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Keywords: Organizational Growth Cycles, Chemnitz, Business Development, Leadership, Management

SUSTAINABLE FISHING: A SOCIAL MARKETING PERSPECTIVE

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INTRODUCTION (STUDY BACKGROUND AND PURPOSE)

Recent studies show that environmental issues have not been given enough attention in international discourse (Amadi, Igwe, & Ogbanga, 2016, p. 24). Overfishing is one of the major issues that the world still lacks necessary tools to combat (UN, 2019 , para 1-6). A study by Petrossian (2015, p. 6) depicts that the global scale of illegal, unregulated and unreported fishing is estimated at about $10 – $23.5 billion loss a year, and if the current depletion rate continues, many large predatory stocks will be erased from existence by 2048. This means that these species will not be there to be experienced by future generations, and primary industry-based economies will suffer rapidly if effective tools to save them are not discovered urgently. For many years, the fishing industry has been the major contributor to the Gross Domestic Product of third world countries such as Mozambique (Jamu & Ayinla, 2003, p. 15). The portion of fish stocks that are within natural sustainable levels has shown a declining trend, from 90% in 1974 to 66.9% in 2015 (UN, 2018, para 6) . Hence, the percentage of fish stocks that are fished at biologically unsustainable levels increased from 10% in 1974 to 33.1% in 2015 (UN, 2018, para 6). Empirical evidence also suggests that the world fish consumption per person is expected to reach 21.5 kilograms in 2030, from 20.3 kilograms in 2016 (UN, 2018, para 37).

Social marketing is a proven and a very powerful tool for achieving socially desirable behaviors (Andreasen, 2018, pp. 3-5). Goldberg, Fishbein, and Middlestadt (2018, p. 5) define social marketing as an attempt of changing human behavior to achieve social good. The principles of social marketing can be applied to different social issues as long as the bottom line is influencing behavior (Goldberg et al., 2018, p. 5). Social marketing is a relatively new specialist area of marketing and thus has not been applied, or at least there is very little evidence of social marketing being applied and evaluated in the context of sustainable fishing. However, social marketing is a very effective approach for encouraging and maintaining desirable behaviors and social change (Beall, Wayman, D'Agostino, Liang, & Perellis, 2012, p. 115). Therefore, it may help increase sustainable fishing practices, provide a better future for future generations and help achieve the overall goal which is global sustainable development.

Only few studies have assessed social marketing attempts to achieve sustainable fishing. The two cases found were in Madagascar in 2013 and the Philippines in 2014. The former was conducted by Andriamalala, Peabody, Gardner, and Westerman (2013) and the latter was conducted by Day et al. (2014). Both studies looked at the design, implementation and effectiveness of social marketing campaigns conducted to achieve sustainable fishing in the above-mentioned locations. Thus, little is known on how social marketing can be used to address unsustainable fishing. This

*Speaker

paper aims to help provide information to social marketers or any other organizations that can help solve the problem of unsustainable fishing.

The study aims to systematically analyze and evaluate research on sustainable fishing with an aim of identifying social marketing factors responsible for success and failures. Thus, a social marketing perspective is used to analyze existing research on sustainable fishing to determine the elements of social marketing that were present, whether consciously or unconsciously, as well as those elements that were missing.

METHODOLOGY

The study follows a qualitative research approach. This research design doesn't include any statistical analysis nor empirical calculations (Mohajan, 2018, p. 2). The data collection method for the study is a systematic review. Systematic review is the process of collecting and combining all relevant data that meet the requirements of the pre-specified eligibility criteria and to answer specific research questions (Moher et al., 2015, p. 3).

Firstly, the study carried out a literature review to develop a theoretical lens to be applied in the study. The theoretical lens consists of social marketing elements. Then a systematic search for research articles dealing with unsustainable fishing, was conducted. Deductive content analysis technique was used to analyze data. The data analysis template was developed to record the collected data. "The template approach involves coding a large volume of text so that segments about an identified topic can be assessed in one place to complete the interpretative process" (Waring & Wainwright, 2008, p. 86).

Using the search term 'sustainable fishing', 159 articles came out (from EBSCOhost database) and 112 remained after automated removal of duplicates by the system. 62 articles were then excluded from the sample since they were not in pdf or downloadable format. 5 articles which were not in english language were also excluded. After title and abstract review, 33 articles were removed from the sample as they were found not to address unsustainable fishing. 12 articles met the inclusion criteria. An in-depth qualitative data analysis was performed for each sample unit (article) with an aim of identifying the evidence of social marketing elements responsible for success of different sustainable fishing attempts or the absence of social marketing elements responsible for failure.

PRELIMINARY FINDINGS

The present study has shown a lack of publication of articles that report sustainable fishing attempts. A total of 8 articles on the topic sustainable fishing met the inclusion criteria which is articles that are addressing the unsustainable fishing problem, written in english language and published from 2015 to date. None of the articles address unsustainable fishing through conscious use of social marketing. All the articles included in the study, shows the evidence of some of the social marketing elements and theories. However, most of them lack the strategic planning process. Some of the solutions that are evident in the literature are: Proper management of fish spawning aggregation, development of strong fishery management systems, Eco-labeling, European Common Fishery Policy, Balanced Havesting and voluntary attempts by businesses that deal with marine products.

If these findings are found to be evident across all the sample units once the analysis process is completed, then recommendations will be made for the application of social marketing principles and processes to propose more creative solutions to addressing the social & sustainability problem of unsustainable fishing. This study can help social marketers and any other

individuals or organizations who aim to achieve sustainable fishing, to see what has worked and what hasn't, and then recommend how social marketing can be applied in addressing the issue and improving the initiatives. This will help prevent making similar mistakes in future.

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Keywords: social marketing, sustainable fishing

Weak entrepreneurial practices in CAMES universities: a structural mismatch or a systemic deficit?

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The CAMES area of higher education, brings together 19 countries in sub-Saharan Africa, which pooled their higher education management policy through the creation of an international organization in the 1960s. Today, the paths are rising and the actors themselves recognize that higher education policies are not entrepreneurial enough, universities that not having a significant impact on socio-economic development. Universities have a weak link with economic social actors (in particular the enterprises) and are confronted, among other, with the massive number of students and low government investment. Literature teaches us that in a similar context, several western universities have embraced and implemented the concept of entrepreneurial university. This concept is little developed in the CAMES space and African higher education is not inclusive in the context of sustainable development.
The entrepreneurial university is recognized as an organization adapted to its environment by its ability to innovate, recognize or create opportunities. It maintains active links with stakeholders and seeks to develop a substantial change in its organizational character to achieve a sustainable posture.The entrepreneurial university is recognized for having an impact on the development of its community and helping to take on the challenges of its community.

The purpose of this paper is to understand how the regulatory framework of Cames universities encourages or does not encourage entrepreneurial practices to facilitate active interaction with stakeholders.

The basic premise is that it is necessary to promote more entrepreneurial university governance models that are adapted to the uncertainty in which they are established. The hypothesis is that the weak entrepreneurial practice observed in the context of the CAMES may be linked among other things to structural factors and systemic deficits. Structural factors could be linked to the regulatory mechanisms and the framework setting out the priorities of the development policies implemented by States. Systemic deficits are dysfunctions or inconsistencies carried by the higher education system itself.

*Speaker

This study is a conceptual analysis whose approach consists in a critical analysis of the existing one. This will include an analysis of the content of the main documents of the regulatory framework, other areas such as the European Union, and the scientific community in relation to the CAMES regulatory framework documents, including quality standards.

This paper will help to describe the regulatory mechanisms put in place by CAMES space for the development of creativity and innovation in its universities.

Keywords: Entrepreneurial practices, entrepreneurial university, CAMES

Guidance to innovation and transformation success

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- Work in progress –

1.1 introduction

Innovation is important for the survival and prosperity of the organisation. Many organisations try to win the struggle of changing nature in the workplace by changing continuously. Extant literature indicated that innovation usually makes the entire organisation stronger and equipped with more opportunities for the future (Jackson & Burnes, 2019). Innovation is a continuous and important factor which managers and leaders in the Twenty First Century should abide with.

1.2 Background of the study

After University of KwaZulu-Natal (UKZN) merged in 2004, there were an extensive arrangement of transformation initiatives in quest of institutional change effect. These transformation initiatives affected the nature, pace, as well as results of change. Additionally, it often tests the institution capabilities and capacities. These includes policy formulation, structure, technology enhancement, culture, strategies, and implementation. The technological changes are very complex and it needs a strong leadership team to channel, motivate and develop employees to attain organisational goals (Stone, Deadrick, Lukaszewski, & Johnson, 2015). Leaders in the organizations have the responsibility to develop and implement strategies, (Bryson, 2018) UKZN leadership is no difference.

1.3. Research problem

Due to the increasing improvements in automation innovation technology, system integration is becoming more important (Al Shobaki, Naser, El Talla, & Amuna, 2017). System integration helps with the need to simplify organisations processes for easier management (Tidd & Bessant, 2018). Therefore, system integration streamline processes, minimise costs and ensure efficiency. When HR processes and systems are not aligned, it can consume a lot of time to manage everything individually (Liu, Gong, Zhou, & Huang, 2017). However, if systems are integrated organisations will gain the benefits of improving efficiency and effectiveness in their processes while minimising disruption caused by having information in different places.

*Speaker

E-HRM system integration provides support in order to achieve the goals of HRM. These goals are broken down into three types which includes improving internal customer services, cost effective, addressing organisation's strategic objectives (Marler & Parry, 2016). The e-HRM drivers help with the transformational and transactional goals achievement of the HR function (Martin & Reddington, 2010). Improving productivity and minimising cost while providing service delivery of the HR function is the focus of transactional goals, on the other hand, transformational goals focus on time saving for HR professionals so that they can be able to address more strategic challenges in order to meet organisational strategic needs (Lengnick-Hall & Lengnick-Hall, 2018; Thite, 2019).

1.4. Research objective

The objective of this study is to investigate whether innovation in the form of technological enhancement create a platform for work processes between employees and managers through system automation. Conducting this study will improve the success rate of change implementation strategies, not only in HR department but throughout the entire institution. To remain relevant, organisations need to adopt new changes and strategies to improve the effectiveness & efficiency of the institution.

1.5. Research Methodology

Concurrent triangulation mixed methods research design was adopted for this study for data collection and appropriate data analysis techniques (Creswell & Clark, 2017). This researcher finds this appropriate to effectively develop a framework for strategic alignment of HR practices with UKZN transformation agenda. Adopting concurrent triangulation design comes with the following reasons: it allows the collection of qualitative and quantitative data simultaneously, it allows the researcher to cross validate, corroborate, and confirm findings in a single study (Creswell & Clark, 2017). Also, it allows the researcher to triangulate the results of the study from separate qualitative and quantitative components (Teddlie & Yu, 2007) In this study, data will be collected using numerical and non-numerical approaches which will include structured questionnaire encompassing closed and open-ended questions.

1.6. Findings

Findings from the literature review in the study conducted previously are in agreement that e-HRM increase efficiency by reducing costs and freeing employees from administrative work, as well as increasing the processes speed (Bondarouk, Ruël, & Roeleveld, 2019; Marler & Parry, 2016). Ruël, Bondarouk, and Looise (2004) found the reduction of costs and HR practitioners' administrative work were the most common results of e-HRM. However, this results were not really measured. Gardner, Lepak, and Bartol (2003) provided evidence that HR service delivery has improved through increased accuracy of data entry. Additionally, e-HRM use was found positively associated with the perception of overall HRM success in employees and their line managers (Bondarouk et al., 2019).

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Keywords: Innovation, Transformation, E, HRM

YOUTH ENTREPRENEURSHIP AS AN INNOVATIVE MECHANISM FOR SUSTAINING RURAL LIVELIHOODS

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INTRODUCTION

With the unemployment rate increasing to 29% in South Africa, entrepreneurship has become mandatory to address the escalating socio-economic inequalities (STATS-SA, 2019). According to (STATS-SA, 2019) unemployment affects the youth more than it affects the adults in the long-run. In recent time, South Africans have been using entrepreneurship as a mechanism to promote economic development (Mbonyane & Ladzani, 2011). Entrepreneurship is defined as the process of converting an opportunity into a business that will generate revenue (Azmat, 2013). South Africa (SA) has triple developmental challenges that include poverty, inequalities and unemployment that hinder rural development. In South Africa, 55% of the populations is living in poverty and the people mostly affected are residing in rural areas (STATS-SA, 2019). Entrepreneurship, therefore, emerged as a tool to alleviate poverty and unemployment (Shava & Maramura, 2017).

South Africans have undergone various revenue-making entrepreneurial ventures in an attempt to alleviate these triple developmental challenges faced in rural areas (Yarime et al., 2012). These ventures include agriculture, arts and handicrafts, farming and transportation (Rogerson & Sithole, 2001). Nonetheless, the ventures are failing due to limited technology use and lack of innovation.

In an effort to address rural poverty and improve the livelihoods of the people, the government has formulated and implemented various policies that include the National Development Plan (NDP) 2012-2030), Reconstruction and Development Programme (RDP) 1994 and the Growth Employment and Redistribution (GEAR) 1996 (Bollaert & Bollaert, 2019). According to Shava and Maramura (2017), these policies were aimed at generating employment and promoting economic development in rural areas. Social grants as noted by Shava & Maramura (2017) are used as poverty reduction mechanisms in rural communities, However, these policies such as the NDP are failing to mitigate poverty among the youth due to corruption and embezzlement of funds which ultimately triggers rural-urban migration.

Drawing from this discussion; youth entrepreneurship can be used as an alternative strategy for improving the livelihoods of rural youth as the government policies are not efficient.

PURPOSE OF THE STUDY

*Speaker

Rural youth livelihoods are failing in South Africa, despite the proliferation of modern technology ushered by the Fourth Industrial Revolution. The technological gap in South African rural areas is evident owing to poor exposure, poverty, inequalities, skills shortage, low levels of technology and entrepreneurial education (Azmat, 2013). Therefore, many entrepreneurial ventures embarked on by rural youth are not viable as an investment in modern infrastructure is still a challenge. The rural authorities are struggling due to limited funding.

Drawing from these assertions, the purpose of the study is therefore to discover how the youth can to be creative enough to utilise or invent their own technologies, to create sustainability in rural areas with the use of mobile applications, drones or through the development of new models and techniques. This will be investigated through identifying the reasons, the youth in rural areas do not resort to entrepreneurship. Secondly, investigating the challenges faced by the youth in entrepreneurship towards sustainable development. Additionally, identifying the social pressures that hinder the development of innovation in rural entrepreneurship. Lastly, through determining the motivational drivers that can lead to entrepreneurial innovation in rural areas.

RESEARCH METHODOLOGY

This study is drawn from a positivism paradigm where a quantitative research approach is used. Questionnaires can be used to collect numerical data concerning youth residing in rural areas. Questionnaires are generally designed to collect large numbers of quantitative data. The population of this study includes the youth between the ages of 14 and 35 from a selected rural area. The simple random technique will be used for sampling rural youth from different communities. This indicates that every element in the population has a known and equal chance of being selected as a subject (Etikan, Musa, Alkassim, & statistics, 2016). Quantitative data collected will be coded, entered into the SPSS Software and presented in a descriptive manner which includes bar graphs, pie charts and tables.

FINDINGS

This research project is a work in progress. The analysis of the literature revealed a plethora of challenges facing youth entrepreneurship in rural areas that include the lack of entrepreneurship education, lack of finances, lack of technology, and social support among others. Another challenge facing youth entrepreneurship in rural areas, is a lack of skills-knowledge. This is due to the rural areas in SA being largely neglected. As a result, the implementation of technology is mostly seen in urban areas. Due to the lack of finances these disadvantaged areas have limited or no access to technology. Technophobia, together with farming being perceived as a non-youth activity reduces the curiosity of the youth in these entrepreneurial innovations. Innovation with the available resources is imperative in rescuing the youth from their dire situation. Furthermore, the literature highlights that these challenges hinder the youth from being innovative and creative within their rural settings.

Behavioural modification needs to be amongst the innovations that need to take place in SA. It is for this reason that the Theory of Planned Behaviour (TPB) was used for this study. The TPB will provide an understanding as to why the youth in rural areas fails to embrace entrepreneurship as a poverty reduction mechanism. Ultimately, the challenges and variables within the theory will highlight the reasons behind the lack of youth start-ups in rural areas.

Furthermore, the literature highlights that rural areas are rich with resources that can be transformed through innovation, into products and services that will promote sustainability. Predominantly agriculture sets the rural areas apart from the urban areas. The involvement of

youth in innovation through agriculture with the use of drones, mobile applications and industrialization are practices the youth can endeavor in. Wi-Fi-hotspots situated in common areas could be instrumental in improving the livelihoods of the youth.

The outcomes from further research will highlight how the innovative platforms will improve rural livelihoods. Farming methods will be improved through the use of drones and mobile applications. These methodologies will ensure that agricultural practices are efficient and will ultimately expose the youth to different markets. Browsing the internet at the Wi-Fi hotspots will improve the youth's entrepreneurial education and expose them to different types of entrepreneurship. The innovative mechanisms will further improve the youth's skills of social cohesion as they will be able to network with various stakeholders.

CONCLUSION

Drawing from the analysis of literature, the government needs to subsidise youth projects and host frequent business workshops promoting youth entrepreneurship and innovation. Such a gesture can help change the mind-set of rural youth to become entrepreneurs and innovators rather than relying on government aid. Further investment by stakeholders can help stimulate innovative capacities and entrepreneurial abilities of rural youth towards sustaining development.

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Understanding frugal innovations in the water sector and their impact on sustainable development: insights from two social innovations in México

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Frugal innovations (FIs) have been defined as an approach to innovation (Pisoni et al., 2018), also as a mind-set, process and outcome (Rosca, Agarwal and Schenkel, 2019) throughout the process. Weyrauch and Herstatt (2017) defined FI as an innovation that drives substantial cost reduction, concentrates on core functionalities and has an optimized performance level. Due to their potential to tackle poverty at the BOP (Bottom of the Pyramid), FIs have gained attention among firms, policy-makers and researchers in both developing and developed economies (Granqvist, 2016).
Studies on FI are predominantly found in the healthcare, electronics/ICT and energy sectors, with a concentration on India, whereas the Americas region (Hossain, 2017) and the water sector are covered to a lesser extent. Very few studies have investigated water-related FIs in Africa and India (Annala et al., 2018). Furthermore, the focus is mainly on drinking water, e.g. the Tata Swach filters (Hyvarien et al., 2016; Levänen et al., 2015a), while other water-related challenges are less studied. Innovations aiming to improve water availability and quality in rural areas are one example.

The BOP (Bottom of the Pyramid) is the largest but poorest socio-economic group, surviving on just USD 2-8 a day. From 2002 to 2010, the BOP population of México increased by 10% to 90 million, according to the Inter-American Development Bank (Azevedo et al., 2015). Rural areas, which are home to most of the BOP, are often relatively isolated and lack a modern urban water infrastructure (UN-Water, 2017). Traditional urban systems are expensive and require a large amount of equipment and specialized maintenance. In México, only around 40% of the wastewater from homes and industry undergoes some form of treatment. Hence, sustainable FIs offer an interesting research pathway. The aim of this work is to explore the FI concept and its impact on sustainability, focusing on Central America, a geographical region rarely covered in published FI studies.

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A descriptive as well as explorative case study methodology (Merriam 2009, Stake 1995) was chosen to investigate an ecological wastewater treatment plant (WWTP) and a rainwater harvesting system (RWHS) for rural communities in Mexico. Utilizing qualitative methods (survey and semi-structured interviews) we obtained a context-specific comparison among the innovations and existing solutions. In addition, the authors consult experts to validate a sustainability evaluation framework (Dressler and Bucher 2018) rooted in the SDGs, and evaluate the impact of each of the two innovations on sustainability.

From a theoretical standpoint we showed that the cases can be termed as "frugal" according to the similarities with the motivations of the innovators and the features of frugal innovations extracted from the literature. The Mexican FIs also share attributes with social innovations and catalytic innovations. The investigated Cases aim to achieving positive socio-economic transformations, as proposed by all three of these innovation concepts. We show and highlight the importance of an evaluation of such innovations in specific context and compared their features with existing solutions in the specific BOP context.

From a practical standpoint, the two cases provided the opportunity to test and validate a framework that was previously used to evaluate the sustainability of FIs in a different geographical and sectoral context. We found that case 1, the WWTP, is expected to have a neutral impact on 48% of the SDGs and similar percentages (15-19%) of impact on economic, ecological and social aspects of the SDGs. Case 2, the RWHS, resulted in 33% of neutral impact with a comparable 31% of social impact on the SDG's. A high percentage of neutral impact indicates, that the solutions might not have an impact on most of the SDG's, but doesn't impair them either. A summary is presented in table 1 integrating the assessment of the experts and their comments.

The framework proved to be a useful and accessible tool for responsible practitioners like managers and innovators, as well as researchers and engineers. The investigation of the two Mexican cases provided several insights regarding nature of frugal innovation and the often assumed connection between sustainability and frugality. While both cases don't positively affect a lot of the SDG's, they also don't impair them and have a positive impact on specific SDG'.

For further research we suggest to extend the research on sustainable frugal innovation to additional geographical areas and conduct cross region studies to validate theoretical findings, and raise the awareness of frugality studies, which is already getting traction in Europe but are less known in Americas.

We recommend to encourage especially responsible social innovators in Mexico, Latin America and the BOP in general, to evaluate the sustainability of their innovation projects and potentially improve it, based on the evaluation. Further studies on frugal approaches aiming to increase the adoption of technologies are also promising and encouraged!

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Keywords: Mexico, Latin America, Frugal Innovation, Social Innovation, Catalytic Innovation, Case Study, Water Research, Bottom of the Pyramid BOP, Sustainability, SDGs

Emerging Research On e-Waste Management In South Africa

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1

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Abstract

Introduction

In this contribution a case is made for the sustained and systematic research about how electronic waste material (eWaste) is being handled in South Africa. We first make the case that such research is warranted in South Africa. In the absence of a body of research on e-Waste management in South Africa we then use examples from research conducted in countries like China and Australia to highlight the urgency of such research in South Africa. Electronic waste is an area of concern as the use of technology is increasing, with it not being uncommon to see an individual with more than one device. The use of technology especially amongst the younger generation is growing at an alarming rate. It would therefore be interesting to investigate the factors surrounding an individuals' intention to adopt correct electronic waste management procedures. To this end the researchers approached third year Information Systems and Technology students, to determine their awareness of the correct disposal of electronic waste. The data has been collected and is currently being analysed. The analyses together with recommendations will be presented in the complete paper.

E-Waste Management in South Africa

South Africa in many respects can be considered a 3rd world country, as evidenced in poorly resourced rural and semi-rural communities. Its urban communities, by contrast, are better characterised as belonging to the 1st world because of well developed infrastructure such as electricity in public places and private homes, reticulated water, tarred roads, private hospitals and clinics, and well regulated commerce practiced in central business districts as well as in suburban shopping centres, including an effective banking industry, and finally, a relatively stable Internet-based digital communications network used for business, education and leisure.

This mix of 3rd world and 1st world aspects has created an academic interest for the investigation of the management of electronic waste or obsolete electronics in South Africa. The concept "obsolete" is based on a user purchasing a replacement electronic component or replacement electronic equipment, after which the old item is (See Figure 1) stored, resold, sent for waste management (recycled) or sent to a landfill (Ahluwalia & Nema, 2007; Mhlanga, 2018).

*Speaker

The e-Waste Association of South Africa (eWASA) has engaged in a number of initiatives that involve both business and the public to engage in the proper disposal of e-waste. eWASA (2008; 2019) considers e-waste to be a generic term embracing all types of waste containing electrically powered components. eWASA defines e-waste or Waste Electrical and Electronic Equipment (WEEE) as old, end-of-life or discarded appliances that use electricity. This would include a wide variety of items such as stoves, fridges, radios, televisions, computers, printers, scanners, games machines, VCRs, DVD players, MP3 players, iPods, wrist watches, mobile phones, GPS trackers, and even electronic circuit boards in motorcars that are considered redundant by their original users.

While we agree with eWASA that the continued increase in digitalization of products blurs the distinction of electrical and electronic appliances, we would like to limit our focus of electronic products to batteries, mobile phones, computers, printers, decoders, digital cameras, digital watches, energy saver light bulbs, gaming machines, Hi Fis, TVs, VCR and DVD Players, MP3 players, iPods, USB external hard drives, USB flash memory sticks and secure digital (SD) memory cards because these the younger generation come across and use these devices fairly commonly.

Instructive Examples from Abroad

Wong (2006) has shown that the freshwater samples collected from reservoirs in China contained a relatively low level of total dissolved solids. This was anticipated because the reservoirs were located outside of Guiyu that had a relatively undisturbed catchment area. The differences between reservoirs and the rivers in Guiyu were especially significant in dissolved silver (Ag), cadmium (Cd), cobalt (Co), Copper (Cu), nickel (Ni), antimony (Sb) and zinc (Zn). This causes concern, as many of these metals could incur toxic effects at excessive levels. Wong (2006), therefore concluded that primitive e-waste processing activities had caused serious metal contamination of the river environment of Guiyu. This was reinforced by a study that indicated soil heavy metal pollution that was caused by e-waste recycling (Kailing, Zehang, Yuanan, Xiangying, Zhiqiang, Hefa, (April 2017)). These findings also ought to cause concern in South Africa, because we are not sure of the volume of e-waste that is sent to our landfills or recycled in an uncontrolled manner and we have not come across any tests for the presence of these metals, especially in our water supply.

According to Davis & Heart (2008) a survey conducted by the Australian Department of Environment and Conservation across Australian cities found that an estimated 92.5 million electrical and electronic items in households. Of these items, about 93% were still in regular use, while 7% were in storage. Of the stored items 3% were not in working order. Computer monitors was the largest category of working equipment found in storage (9%), followed by computer box units (8%). Davis & Heart (2008) also reveals that 51% of portable items are being disposed of via the normal garbage bin. The article also indicates that electronic and electrical wastes are a significant proportion of the Local Government's waste management role and budget. The research further indicated that increasingly, smaller and cheaper electronic items are being too easily disposed of in municipal waste systems and this, coupled with an increase in the number of, and turnover of manufacturers and suppliers to the market, may see Local Governments assuming a key role in the future of e-waste management (Davis & Heart, 2008). This also aught to be of particular concern for South Africans because data of this nature is not available at a time when our telecommunications sector is growing apace. The implication of this would be that more people are going to be connected to the Internet and this will result in people updating their electronic devices on a more regular basis, this in turn will result in more obsolete electronic devices. We currently do not know exactly where these obsolete electronic devices go.

e-Waste Legislation in South Africa

In July 2008, the E-Waste Association of South Africa (eWASA) was formally established as a Section 21 non-profit company (South African Companies Act 61/1973). According to Ecroignard (2006) of eWASA, although South Africa does not have specific legislation dealing with e-waste, a number of other acts such as the "The National Environmental Management Act" (Act 107 of 1998) (NEMA) can provide a principal framework for sound environmental management practices for all development activities.

e-Waste Research in South Africa

A search of South African research databases, using keywords such as "electronic waste management in South Africa" and "e-Waste management in South Africa", has been done on several occasions in the recent past. This includes the Nexus database of the South African National Research Foundation (NRF), the international database of scholarly research, Science Direct, Navtech (SA Technikon research) and UCTD (Union Catalogue of Theses and Dissertations at South African Universities). These searches indicated that no theses have been completed at any South African universities that focussed on problems relating to the management of electronic waste in South Africa, and that no research has to date been published in international journals on the topic.

Conclusion

While there are several e-waste management initiatives in South Africa, we have found no research in South Africa on e-waste management. South African legislation that regulates the management of e-waste is not enforced but instead is to be followed in a voluntary basis.

China as an example of an emerging economy and Australia as an established free market economy. We consider South Africa as falling somewhere in between 3rd world and 1st world countries like these. Finally, we note that there are no tertiary institutions in South Africa where curricula are taught on the management e-waste. Aspects of the empirical research will be added once it has been analysed.

Figure 1: Life-cycle of e-Waste, adapted from Ahluwalia & Nema, (2007).

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POTENTIAL ROLE OF DRONES TO IMPROVE IN-STORE INVENTORY VISIBILITY.

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ABSTRACT

The retail sector has been one of the most evolving industries in the past years, as new technology has emerged (Manfredi, 2018). The advancement of the Internet enables innovations that speeds up the inventory counting process, performs inventory tasks with higher accuracy, lowers the costs of human labour, minimizes the risk of workplace injury and reduces downtime when operations have to halt for inventory checks. This research presents the innovation of Unmanned Aerial Systems (UAS) also known as drone technology to improve the efficiency and effectiveness of warehouse management systems. With the introduction of drone technology human labour can move to higher value jobs as drones take over repetitive function (Wollenhaupt, 2018).

The scale of modern retail operations makes even Radio frequency Identification (RFID) scanning inefficient (Hardesty, 2017). Walmart, for instance, reported that in 2013 it lost $3 billion in revenue because of variances between its inventory records and its stock (Hardesty, 2017). Even with RFID technology, it can take large retail store three months to perform a complete inventory review, which means that these discrepancies often go undiscovered until exposed by a customer request (Hardesty, 2017). Out-of-stocks could be costing retailers nearly $1 trillion, according to research from the IHL Group (Arthur, 2019). Such out-of-stock situations include empty shelves or instances where consumers cannot find what they're looking for (Arthur, 2019). Due to the increase in volume and variety of storage and retrieval demands, a WMS with better effectiveness and efficiency is required (Chiang, 2010).

Researchers have now developed a system that enables small, safe, aerial drones to read RFID tags from tens of meters away while identifying the tags locations with an average error of about 19 centimetres (MIT, 2017). The researchers envision that the system could be used in large warehouses for both continuous monitoring, to prevent inventory variations, and location of individual items, so that employees can rapidly and reliably meet customer requests. Small drones can navigate stores and warehouses autonomously, scanning shelves and codes to report on stock outs and planograms, thus giving unprecedented levels of strategic visibility (Arthur, 2019). The drone system can collect hourly and daily data on out-of-stocks and real share-of-shelf, with 98% accuracy (Arthur, 2019).

Purpose of the study

*Speaker

The aim of this study is to assess the potential role of drone technology to improve accuracy of in-store inventory records within distribution centres and to address some of the current issues experienced with inventory management. These issues involve shrinkage, obsolete stock, lead time and product type.

Research Methodology

A case study of Unilever will be conducted. Unilever was selected for the case study based on convenience as the company has a large, national distribution centre in Pietermaritzburg. The target population will need to have specific knowledge of the subject under investigation and enough, relevant work experience in the field of supply chain management. Specifically, warehouse management, operations and management systems experience.

This study will make use of a non-probability sampling technique, convenient sampling. The sampling frame will be selected based on their knowledge, relationships and expertise regarding a research subject thereby following a convenient, purposive technique because we will talk to people with the required knowledge. A preliminary visit to Unilever to request a Gatekeeper's letter, indicated that the sample size will be a maximum of 4 people who cover all the aspects of the business relevant to this study.

Research Questions

This study aims to answer the following questions:

- What inventory visibility systems are currently in use?
- What are the difficulties associated with maintaining accurate inventory records in a distribution centre?
- Is the use of drone technology feasible?
- What major advantages can drones and other technologies provide, in terms of :

- Speed

- Accuracy

- Cost reduction

- Greater efficiency

- Reduced work force

Objectives

- To investigate the inventory visibility systems currently in use.
- To identify the difficulties associated with maintaining accurate inventory records in distribution centres.

- To determine if the use of drone technology is feasible.
- To assess the major advantages drones and other technologies can provide, in terms of speed, accuracy, cost reduction, greater efficiency and a reduced work force.

Data Analysis

Data analysis is used to analyze the data which is gathered from personal interviews. According to (McCabe, 2015), this is the type of research whereby data gathered is categorized in themes and sub-themes, to be able to be comparable. A main advantage of content analysis is that it helps in data collected being reduced and simplified, while at the same time producing results that may then be measured using quantitative techniques (McCabe, 2015). Moreover, content analysis gives the ability to researchers to structure the qualitative data collected in a way that satisfies the accomplishment of research objectives (Smith, 2018). However, human error is highly involved in content analysis, since there is the risk for researchers to misinterpret the data gathered, thereby generating false and unreliable conclusions (Dumay, 2014).

Qualitative Data Analysis for this study will involve a careful analysis of data that will be collected from participants, to address the research questions and objectives of this study. The interview will be recorded as well as notes will be taken for the purpose of not omitting any important information. Data that will be gathered from the interview guide will be analyzed. In qualitative researches using interviews, focus groups, experiments etc. data analysis is going to involve identifying common patterns within the responses and critically analyzing them in order to achieve research aims and objectives.

Findings

Companies like Walmart which works with Unilever to Push for Innovative Place-Based Partnerships (Fishman, 2018), have considered the use of drone technology since it has proven to be a very important part of the supply chain in many ways, namely, operational, improving warehouse functionality, reducing production downtime, reducing labour turnover and downtime, improving health and safety (Edward Companik, 2018). Since research has adopted technological evaluations and technical diffusions, this study suggests joining models that will provide a wide range of supervision in order to assess cost and timing of technology adoption so that necessary investments can be determined for the innovation of drone technology (Muro, 2015). Limited research has pointed out the impacts of drones on economic and productivity outcomes (Muro, 2015), especially in supply chain management, making and improving further research in this area is essential.

Done technology solutions might not solve all the problems associated with inventory management, however, they allow companies, large and small, to apply autonomous drone technology and robotics, coupled with computer vision technology, artificial intelligence, RFID sensors, and cloud computing to improve accuracy significantly (Yearling, 2019). Besides gaining an edge in understanding inventory levels and being able to move inventory faster throughout the supply chain, these drones are also creating safer working environments, redirecting staff to handle high value activities (DC, 2019).

Justification

Companies that convey a significant amount of stock are constantly looking for innovative logistics solutions that can have a positive impact on improving the overall efficiency and effectiveness

of their stock checking process (PINC, 2019). According to Mayadah Hassan, 2014, some companies stop operations to carry out a full physical stock count, while others perform more targeted checks, with cycle counts in areas that deal with high-value or high-volume products. This can be tedious, costly, disruptive, require equipment and exposes people to safety risks. Most importantly, inventory accuracy is never guaranteed due to the verification process being manual and also coupled with the time taken to execute (Nordrum, 2017).

Drone tech is a data collection system that provides large warehouses with a robotic solution for stock take, providing live feedback and integration with Warehouse Management systems (Hardesty, 2017). It has proven to save hundreds of man-hours but most importantly has provided a safer alternative to traditional labour intensive methods involving reach trucks, forklifts, mancages and scissor-lifts (MIT, 2017). These drones scan the barcode on each pallet and records the location of each item in the warehouse management system, proving to be up to 50 times faster than manual capturing (Hardesty, 2017).

Drone tech uses the latest drone platforms, hardware, software, scanning, and communications technology that integrates to existing warehouse management systems and Excel (PINC, 2019). The use of wide optical sensors, warehouse drones can navigate, identify inventory, determine inventory location, and fly safely in a warehouse environment (Nordrum, 2017). The power in the drone inventory management solution lies within a refined software capabilities that provides three dimensional mapping, navigation, inventory identification and location accuracy (PINC, 2019).

Conclusion

Drone technology offers the potential for significant efficiency gains both for inventory handling and inventory transparency. Drone technology also offers greater potential for inventory audits and real-time supply chain visibility. Warehouse drone technology contributes to supply chain competitive advantage through supply chain integration and shortened cycle times and it also supports improved customer service levels and supply chain responsiveness.

Arising from the present research will be recommendations for firms operating under emerging economy conditions where deployment of advanced technologies is much less widespread.

Keywords: Drone Technology, Warehouse Management Systems, RFID

Global creative arts industry : a study into the innovative marketing of music

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Introduction

The relationship between art and marketing is a multifaceted one. Arts marketers need to pay attention to a range of issues, which may not arise in the same way, or to the same degree as conventional product marketing. Music implies various things to various individuals. From Michael Jackson to Lady Smith Black Mambazo, music has been created, crossed continents and arrived to a large number of individuals. The feelings and thoughts that music communicates, the circumstances where music is consumed and listened to, and the frames of mind of music players and writers all vary between regions and time eras. Music has a universal language that allows this art to cross cultural, geographical, psychological, educational, mental or spiritual boundaries. Its capabilities are limitless. So how does this music reach the individuals?

The answer is music marketing. Marketing, amongst other things, has the task of joining production and consumption. As the marketing profession has undergone transformation with the move from a product orientation to a customer-centric orientation, so has music marketing (Ogden et al. 2011, 120). However, for the purposes of speaking accurately of music marketing, a systematized offer of produced music must be presented - what we commonly term – the music industry.

Music is found in all known cultures, historically and present. Wallin, et al (2001) mentioned that the entire world population (including the most disengaged tribal groups) have a form of music, and it may be assumed that music is most likely to have been present in the ancestral population, prior to the dispersal of humans globally. Subsequently, the origin of music may have been developed in Africa and thereafter, advanced to turn into a key component of human life (Krause & Bernie, 2012) .

As the music business turns out to be increasingly populated, music promotion is becoming hard for a great deal of craftsmen. Indeed, music advertising, likewise know as music advancement, is the way toward bringing many issues related to your music to light. By showcasing your music, you are getting individuals to realize it exists.

Purpose:

Like any culture industry in a market economy, the job of the music industry is in a general sense; to convert its product items into monetary value. This procedure has been essentially affected by the technological advances that have decided the creation, dispersal, and gathering

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of music.

Music is a type of art which uses sound as a medium. As a consequence, music results in the sentimental enrichment of people, especially in the creation of inner peace, personal satisfaction, creating unique moods, excitement, pleasantness and similar sentiments. It is necessary to emphasise that music is really just the reproduction of art, vocalisation and/or instrumental attached to art. A concrete music product in most cases, is represented as a piece of music or composition in various forms; with differing tones, rhythms and dynamics, melodies and harmonies, which are the fundamental elements of music.

The reproduction of music may develop in three independent ways, namely:

- by live performance (concert) which is a much more common to music consumer,
- by way of a physical medium (a sound recording – once being the gramophone record and audio cassette, and today in most cases by way of CDs and DVDs)
- by today's modern formats which are based on computer and communication technologies which will be specially described in this paper.

Innovative methods of reproducing and marketing music will be the focal point of this examination study, which has been abridged as music advertising.

Technological innovation has been a piece of music's DNA since the appearance of recorded music and radio telecommunications in the mid twentieth century. This is a classic example of how engineering and the arts have been steering in the same direction. With the landing of the mp3, the music business encountered the unforgiving truth of the global disruption of its business model before any other, led by online and user-centric platforms.

Specialists need to discover new and imaginative methods of monetising engagement. Music drives the adoption and engagement for new technologies. Technology allows for new and exciting ways of creating music and connecting with fans a- all with the motive of gaining profits. World renown artist Les Baxters (1921-1196) once uttered wise words and said "any good music must be an innovation". He was quite accurate.

In order to build and sustain this inovation movement, the music industry needs to excersize a few cognitive skills, namely:

- Curiosity – an understanding of the value chain for music startups and the music technology culture.
- Transparency – valid and reliable data sources and intelligence sources , and the collaboration of industry level initiatives.
- Risk Management – music corporations know how to risk and gamble on talents. By sharing this risk with startup msuicians, they may gain some equity, and share expertise to leverage artists' reach and profits.
- Creativity – this a common trait from individuals with technological & artistic background have this in common. They belive in innovation as a way to change the world.

Method:

According the IFPI Global Music Report (2019), the global recorded music market grew by 9.7% in 2018,for the fourth consecutive year of growth. Total streaming profits increased by 34.0% (almost half of all music revenue) driven by paid streaming. The universal advancement of digital music has caused an extreme re-positioning of the manner in which consumers and the creators of music view and work the industry. The digital compression of music files has made them easily attainable worldwide, for a small fee or illegal download. This has caused the music business to reconsider how they are to make a profit off their artistic offerings. These new methods for music distribution and promotion have not just escalated the music business, however, have also made insurmountable amounts of changes. Recording houses are losing control as artists and consumers gain the upper hand.

This paper seeks to gain a broader understanding of the innovative development of music marketing globally. A secondary data collection method will be pursued for this study.

The following constructs will be investigated:

1. Technology and music's complex relationship

2. Global consumer attitudes towards music marketing

3. Global music marketing trends

4. Innovative music marketing strategies (offline and online)

Secondary sources will allow an extenive engagement, analysis, evaluation and interpretation of the topic, by reorganising information reported by researchers in primary literature. These sources of data collection will include:

• Journals or Periodicals

• Articles

• Textbooks

• Data compilations

• Web databases

Findings:

This research project has recently commenced, theefore the researcher is not able to present results.

Status : **work in progress**

Based on the literature review in progress, the management of innovation in arts is indeed complex. Not only are arts marketers dealing with economic, competitive and customer dynamics, but also a potentially wide range of artistic, social and cultural issues which are more salient in the arts industry than in mainstream industries.

Conclusion:

One conceivable clarification of consumer conduct towards the music business lies in environmental psychology and forms of behaviour. These collectively, emphasise the role of emotions in the consumption of music. These emotional responses may be direct results of a person's characteristics, but often they arise from physical or social stimuli coming from the surrounding environment.

Factors and/or needs which influence and motivate participation with art :

- cultural (e.g. knowledge),
- symbolic (e.g. using the arts as a source of meaning for communicating personality),
- social (e.g. building social relationships through consumption of the arts), and
- emotional

The arts offer rich experiences - not just for artists and consumers, but also for arts marketers and researchers. The field of arts marketing remains very diversified and is still trying to define its identity and role within the discipline of marketing as much as within broadly understood cultural production and consumption.

In a world where it is not only impossible to define art, but also to identify boundaries between artistic production, consumption and everyday life, the relationship between art and marketing is becoming more intimate, but by no means easier and less controversial than ever before.

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Keywords: music marketing, innovation, technology, streaming, arts marketing, global consumer behaviour, music strategies

Developing an air pressure based muscle biofeedback device as a strength testing and rehabilitation tool. A new innovation powered by multi-international R&D collaborations.

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Problem Statement

Musculoskeletal disorders, known as MSD's are typically characterised by injuries or pain in the joints, muscles, bones, nerves, ligaments and limits human mobility, dexterity and functional ability that reduces people's ability to work and participate in social roles.

The World Health Organisation (WHO) has recognised that MSD's contribute greatly to disability across the human life-course in all regions of the world and in particular have a significant impact on human function. MSD pain is a global challenge as it affects up to three quarters of the overall population. It is the most common cause of severe long-term pain and disability in Europe with a tremendous social and economic impact. Evidence indicates that within the European Union (EU), MSD's represents 15-20% of consultations in primary care; MSD's are the major cause of work absence or productivity loss, disability pensions, early retirement and increased social support. For these reasons, MSD's are recognised as a priority by the EU Member States and European Social Partners according to the European Agency for Safety and Health at Work. As the WHO has recognised the impact MSD's have on human function ability, they have devised the Integrated Care for Older People (ICOPE) approach which identified the need to improve musculoskeletal function through a range of interventions, with multimodal exercise as a key component. While management of some musculoskeletal conditions often requires specialist and/or surgical care, many musculoskeletal conditions can be managed in primary care by a combination of core non-pharmacologic interventions such as exercise, weight management

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and psychological therapies.

Why Important

However, a host of problems plague exercise rehabilitation treatment in the 21st century, e.g. inconsistent outcomes; time to recovery (treatments take too many sessions); low success rate of treatments; increased financial costs as well as subjective clinical assessment methodology that are used to monitor the progression or regression of a patient. In terms of different treatment methodologies in rehabilitation medicine, movement and exercise are among the most key treatment approaches in MSD's. Within this approach, exercises are often prescribed to specific anatomical areas, either to treat symptoms by improving movement and muscle strength or to prevent specific injury. Also, exercises need to be performed regularly for a certain period of time and with specific objectives.

Action Plan

Taking all these factors into consideration, a need arose to automate these processes and to provide valid and reliable input data to guide the patient in terms of clinical objective muscle assessments, program prescription and accurate exercise performance. This led to the innovative development of the portable, pressure air biofeedback (PAB®) device, using air pressure as a biofeedback and strength testing and rehabilitation tool.

For PAB® to be used in clinical and epidemiological settings, it had to conform to specific criteria described by Helewa *et al.* (1981;1986) and Matheson *et al.* (1992) namely: 1) it should be quantitative to produce numbers, 2) it should be sensitive to changes in muscle strength, 3) it should be reliable and free from defect, 4) it should be reproducible in the hands of different observers, 5) it should be adaptable to different muscle groups, 6) it should be portable, 7) it should be fast and safe to apply, 8) it should be comfortable and simple to use and 8) it should be inexpensive. With this specific criterion in mind, PAB® was developed, researched and validated through clinical trial-to-trial and day-to-day tests in a PhD study, however in its first application was limited to the strength assessment of the lumbar spine only.

Realising this limitation, the PAB® developer in 2012, set up an international collaborative meeting between PAB® and Togu®, a German Company who manufactures air-filled exercise products. A working agreement was negotiated where PAB® would exclusively use Togu® air-filled products and Togu® would assist with the development of new specific air-filled products as PAB® develops new muscle strength tests. Further to this, Togu® became the exclusive international distribution partner of PAB®. As PAB® was further developed, new and different Togu® air-filled products were added to the PAB® testing package, allowing it to measure, in an innovative way, a wider range of muscle groups of the body that included the neck, shoulder, chest, arm, hand, hip, leg and posture. Thirteen new muscle performance tests were added to the PAB®muscle testing protocol. During this period, PAB® also registered South African and German patents for intellectual property (IP) protection.

In 2016, a research and development (R&D) collaboration meeting was set up between the University of Kwa-Zulu Natal (UKZN), South Africa and the Technical University of Chemnitz (TUC), Germany. A research collaboration and memorandum of understanding (MOU) was signed between these two universities. During 2018/2019, a French company, Kinvent, unknowingly developed Bubble, a similar air pressure device but as a wireless application with no R&D history. However, with IP protection in place, the PAB® developer approached Kinvent and Togu® for a multi-international collaboration to collectively develop a new air pressure device, integrating software applications, hardware developments and the continuation of us-

ing Togu® air filled products for reliability and validity purposes. It was also agreed that Kinvent would manufacture the Bubble device and that Togu® would continue manufacturing of air-filled products. After collaborative thinking, it was decided that the new device would be called, Bubble-powered by PAB® while a new IP agreement was signed between PAB® and Kinvent. Further to this, an international distribution agreement to collectively distribute Bubble-powered by PAB®, has also been reached between Kinvent and Togu®. PAB® would continue with multi-international collaborative R&D of Bubble-powered by PAB®. To this end, PAB® has also established a possible research collaboration agreement with Paris-University Saclay.

Findings

PAB® has been developing a footprint of scientific reliability and validity over the last few years. In a PhD study completed in 2009, highly significant relationship were found between air pressure output (mb) and calibrated weights (kg). In addition, Pearson correlation calculations showed a significant relationship between PAB® force (mb) and EMG activity. The results of the PAB® test differentiated between LBP and asymptomatic subject's lumbar isometric extension strength without any risk to the subjects.

In 2019 three PAB® research studies have been successfully completed by TUC. In assessing PAB® retest-reliability and concurrent validity of knee extensor strength in young healthy adults (Stäuber *et al.* 2019), it was found that knee extensor strength assessment with PAB® shows moderate retest-reliability and moderate concurrent validity in young healthy adults and a modification of testing methodology is necessary to improve consistency. In assessing PAB® retest-reliability and concurrent validity for measuring handgrip strength in young healthy adults (Stäuber *et al.* 2019), it was found that handgrip strength assessment with the PAB® device is highly reliable in young healthy adults and shows high concurrent validity. In assessing PAB® reliability of muscular strength assessment in prostate cancer survivors (PCS) (Stäuber *et al.* 2019), the PAB® device demonstrated acceptable test-retest reliability in PCS for most of the standard strength tests. In particular, assessment of handgrip and hip adductor strength was shown to be highly reliable. With regard to the only moderate reliable BC, SHA and KE tests, a modification of the testing methodology is necessary to improve consistency

Various other research studies have also been successfully completed at UKZN investigating the following: 1) Hamstring)/quadriceps ratio and hip abduction strength imbalances in amateur rugby union players (Brown *et al.* 2018), 2) Shoulder strength in amateur rugby union players with or without shoulder injuries (Stening-Smith *et al.* 2018) and 3) The correlation between strength on the throwing distances of selected ball sizes in children with disabilities (Mayat *et al.* 2019). In all these research studies, PAB® was used as the muscle strength testing device, demonstrating the testing adaptability of PAB® to different populations as well as reliable testing of various muscle groups.

Recommendation

What does the future hold for Bubble-powered by PAB®? Looking ahead, a multi-international collaboration meeting between PAB®-UKZN, Togu®, Kinvent, TUC and Paris- University Saclay at the MEDICA Expo 2019, Dusseldorf has been set up and all collaborators will attend. This meeting will focus on applying for Horison 2020 funding to possibly accelerate R&D and full product commercialisation or Technology Readiness Level 9 of the new Bubble-powered by PAB®. Furthermore, a multi-international collaboration effort has been established between SME's and researchers of three countries, two European and one African, to collectively develop a medical device to treat people who suffer with MSD's globally and to help them return to

optimal human function, free of pain. As Bubble-powered by PAB® develops a footprint of scientific reliability and validity, it may be recommended as a portable, inexpensive, simple and scientific muscle testing device to rehabilitation professionals in both developed and developing countries.

Keywords: PAB, research, collaboration, Togu, Kinvent, air pressure, muscle strength

"Fraunhofer Pioneers Challenge" – an interdisciplinary approach for tackling possible future scenarios and wicked problems

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Abstract
The benefits of interdisciplinary teamwork in innovation and transformation processes are already recognized in many fields. (Lewrick, 2018) However, its use and application to bridge the gap between science/technology and design/art is still rather unexplored. The "Fraunhofer Pioneers Challenge" explores therefore the potential of a collaborative workshop-format between Fraunhofer scientists and design/art students as a means to generate not only new research questions but also sustainable and innovative Ideas and solutions to possible future scenarios and so-called wicked problems. (Rittel, 1973)

Introduction

In an increasingly complex world, we are confronted with unpredictable problems and unclear questions, regarding our future. To tackle these questions interdisciplinary collaboration between various fields with their different perspectives could play a crucial role. Based on the principles of the Fraunhofer "Netzwerk Wissenschaft, Kunst und Design" (WKD-Network) and its aim to enable a fruitful dialogue between scientist and creatives, the "Pioneers Challenge" was formed as a concept within Fraunhofer. Implemented as a week-long workshop, the concept strives to enable a symbiosis between scientific expertise and creative and artistic perspectives. Instead of predicting our future the "Pioneers Challenge" establishes a framework to explore possible future scenarios and to imagine what kind of future people might want to live in. It aims at providing the possibility to explore ideas rather than finding immediate solutions. Additionally, it pursues the following question: Can creatives enrich research and science with competences attributed to their discipline such as visual thinking, a confident but critical approach to unclear questions and a human centered and solution-oriented working method? (Michlewski, 2008)

Implementation

The potential of such an interdisciplinary concept is studied on the basis of strategic approaches from specific Fraunhofer-Institutes at the "WKD-Network". For the first "Pioneers Challenge"

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a week-long innovation camp was defined, concerning a region which stands in actual focus of abandoning brown coal production: the Lausitz. The existing floating autartec®-house built by Fraunhofer Institute for Transportation and Infrastructure Systems IVI – funded through Federal Ministry of Education and Research as regional innovative center of growth – with its renewable energy supply, integrated storage technologies and natural building materials represents not only a symbol for sustainable living. In combination with an innovative architecture and design it incorporates the raise towards a new age. On basis of this vision participants were asked to tackle issues regarding the biological, industrial and social transformation processes of this region and to work on possible solutions that could increase its attractiveness.

The camp took place at the Bergheider See in September 2019 with 18 selected participants: 12 Students (design, architecture, art) and 6 Fraunhofer scientists (mathematics, economics, product engineering). The participants were divided into three teams with the following thematic complexes: "Housing" (architecture, resource efficiency, infrastructure), "Living" (culture, participation, mobility) and "Value Creation" (tourism, regional resources, new work). In order to work creatively but purposefully and to liberate the potential of all participants the implementation of the concept was based on four pillars:

- Understanding and observation on-site: A crucial role in understanding the issues of this structurally weak region was to execute the workshop at the Bergheider See. By working on-site, the region‘s challenges could be experienced first-hand. Living together on-site and interacting also beyond the workshop, contributed to a positive team dynamic.

- Motivational speeches: To share Fraunhofers research approaches, experiences and results with all participants in a transparent way, the institute's director of Fraunhofer IVI and a research coordinator gave motivational speeches at the beginning of the workshop.

- Ideation: In addition to theoretical input from Fraunhofer scientists and activities in order to understand the region and its history of coal mining, various creative units and innovation methods were carried out throughout the week. The aim of these units was to support the participants not only to understand the challenges within their thematic complex but also to pursue a human centered approach in their Ideation.

- Prototyping: In an interdisciplinary team setting it can be crucial to find a common language in order to work constructively and to meet the desired outcome. One way to achieve that is by making ideas tangible. By visualizing their ideas, the teams could not only communicate and learn about the strengths and weaknesses of the idea but also identify new directions of their concept.

Results and Ideas

Within their respective thematic complexes, the teams presented three Ideas directed at different structural problems of the Lausitz. The ideas are spanning from a mobile supply system

for rural communities to a hub to enable the local inhabitant‘s identification beyond coal mining through traditional and regional crafts. As an example of successful interdisciplinary teamwork and an outcome with high potential of implementation, poses the following concept of Team "Housing" (Schulze, Klüber, Schwarzenberg, Breuer, Rückeis, Schauer, 2019):

Initially, to get in touch with the topic, the concerning region (Lausitz) was quickly analyzed: By gathering geographical and economical facts and by experiencing the spirit of local villages and small cities with their distance in-between, the team could get a rough but intensive insight. The wish and goal to connect advantages of existing settlements with advantages of vast recultivated mining areas but also to overcome disadvantages of sparely developed regions was formulated. For establishing an argumentative basis and to empathize with a possible target group the team defined different personas from which a sum of needs and potentials was derived. In parallel, the team worked graphically drafting to find a shape and layout expressing the goal of "connecting" a settlement on recultivated mining areas to the needs of the defined target groups. Within this approach, aesthetical and conceptual questions were discussed against the background references on site. In the ongoing approach conceptual models were shaped.

As a result, the team "Housing" developed a settlement characterized by a strong vector, which connects a marina on a flooded mining pit throughout recultivated mining ground towards the direction of existing villages and cities. Sidelong plots with housing concepts are arranged along this straight path. Two zones divide the housing concept: one space can be used for work as a studio. It is more public orientated with an open display window towards the connecting path. The other zone serves for living purposes and stands more back to guarantee a protection of privacy. Connecting these two zones a tight central power and water supply (HookUp) gives a midpoint to the architectural concept. "HookUp" also stands for making land ready for building.

The housing concept is expected to be used as temporary living zone with a technologically high-equipped working studio. In application the settlement and the housing concept serves as a model for temporary living to provide models of new work: On the one hand, people form major cities can use the concept to escape form the rush and hectic pace in order to concentrate on issues relevant for output. On the other hand, locals can use the concept as a step stone to more technologically equipped working space and alliance to other enthusiastic practitioners. With the character of open display windows, the housing concept wants to transport openness and transparency for technologies used by the temporary inhabitants. In addition to separate housing plots with their individual studio, the settlement is complemented with shared working spaces and a central auditorium hub for communal and cultural activity. In addition the settlement and architectural concept was refined with material definitions to calculate thermal conductibility and energy consumption. For energy supply, a concept of power-to-gas-technologies combined with storage possibilities and block-type thermal power stations was drafted.

Findings and Conclusion

The overall results and Prototypes as well as the functioning of the teamwork benefited greatly from the participants diverse perspectives and a collaborative thinking which was implemented through the workshop structure. The structure as such played an important role in enabling a smooth teamwork and providing the participants with necessary input.

However further testing will be necessary to refine the possible innovation-methods for this kind of workshop. Although the three teams contributed with a vast variety of ideas, the results remained very much conceptual. Especially in ways of realization and implementation of ideas the workshop-concepts needs further adjustments. It is aspired to ensure an optimal communication and collaboration between the different disciplines and to use the participants full potential

in not only generating Ideas, but also in putting them into practice through prototyping.

As the basic concept of an interdisciplinary approach remains the same, the participants of next years "Pioneers Challenge" will be working on a different topic. Said this, the general goal however remains to further explore the functioning of this workshop-concept and to establish it as an ongoing format within the Fraunhofer" WKD-Network".
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Keywords: future scenarios, wicked problems, renewable energy supply, sustainable living, interdisciplinarity, science, design, user, focused, human, centered, prototyping, design methods

A conceptualization of idealistic and capitalistic sharing models as partial organizations - A Delineation by the example of Germany

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A conceptualization of idealistic and capitalistic sharing models as partial organizations.
A Delineation by the example of Germany.
- Work in progress -

The more academic research explores the depths and nuances of the sharing economy (SE), the greater the confusion about its terminology and definition seems to evolve. Depending on the research discipline and core of a given investigation [Curtis & Lehner, 2019, p.224], the concept of SE and its models is generally illustrated by a broad range of activities and attributes [Schor, 2014], while simultaneously being corroborated by leading, industry-specific examples such as Airbnb and Uber [cf. Pedroni, 2019]. Despite the phenomenon has existed for quite some time, it has undergone a dynamic reorganization of its structure and possibilities through technological progress [Ranjbari et al., 2018, p.1; Heiling & Schumich, 2018, p.20]. In the wake of new technologies, sharing models are thereby increasingly contrasting with the initial understanding of the SE [Wedde & Wedde, 2015, p.2], causing tensions between original archetypes of the SE and advanced, technology-based sharing models [Wedde & Wedde, 2015, p.2]. Moreover, the concepts' differences surpass its similarities, resulting in an increasing inconsistency within the term [Pedroni, 2019]. It becomes distinct, that the development of a universal definition for the SE is nearly unattainable due to the concept's profound heterogeneity [Schor, 2014]. The result is a confused understanding about what it is [Botsman, 2013] and which models actually relate to the notion [Schor, 2014]. While some researchers support the necessity of a distinct interpretation of the SE [cf. Deutscher Bundestag, 2016], more recent studies promote the "need for an organizing framework that allows mapping out and making sense of the different perspectives on the sharing economy" rather than a narrow definition [Acquier et al., 2017, p. 1]. Additionally, Netter and colleagues [2019] support the call for a conceptualization, which "is neither bound to particular industries nor based on debatable normative underpinnings and thus supports more nuanced analyses and debates" [Netter et al., 2019, p. 6ff.].

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However, literature continues to lack on a conceptual understanding of the SE [Deutscher Bundestag, 2016, p.4], which acknowledges its "complex nature without ignoring the ideological disputes" within the field [Acquier et al., 2017, p. 3]. Yet, the importance of the subject becomes apparent through an increased presence in media [Hermann-Fankhänel, 2018, p.332] and sparked interest in research [Nguyen & Llosa, 2018, p.1]. Additionally, rising paradoxes and tensions about and between idealistic and capitalistic sharing models influenced through technology [cf. Netter et al., 2019, p.17], confirm the necessity to foster a universal understanding of the SE for future research.

Therefore, Netter et al. [2019] introduced a conceptual framework to describe sharing models on the basis of organizational key elements, which cultivates a distinct conceptualization of the SE while simultaneously maintaining its diverse nature [Netter et al., 2019, p. 9ff.]. The central idea of the framework originates from the "concept of partial organizations" by Ahrne and Brunsson [2010], who acknowledged the existence of organizational entities outside traditional, formal organizations by differentiating between complete and partial systems [Netter et al., 2019, p. 9]. Both social orders are built on decisions about membership, hierarchy, rules, monitoring and sanction, which demonstrate core elements of organizations [Ahrne & Brunsson, 2010, p. 4]. However, access to the given organizational key elements differ between both organization forms [Ahrne & Brunsson, 2010, p. 5]. It is to note, that the technological progress is emphasized as a major influencing factor to current sharing models, which influences organizational structures and the relation to the term's original meaning [Netter et al., 2019, p. 6ff.]. In order to encompass this phenomenon, a distinction between common-and market-based sharing models is supplementary made [Netter et al., 2019, p.19], which accordingly to Dobusch [2019], includes changes resulting from the technological progress and its impact on the evolution of sharing models [Dobusch, 2019, p.114].

The theory of partial organizations facilitates the assessment of organizational order "outside formal organizations" [Ahrne & Brunsson, 2010, p. 6]. Ahrne and Brunsson [2010] demonstrate the necessity to examine current forms of partial organizations, since the contemporary world is increasingly influenced and directed by those new and various forms of organizational power [Ahrne & Brunsson, 2010, p.19]. Maier [2017] further notes, that even traditional sharing models had organizational and economic structures that brought supply and demand together through their marketplaces [Maier, 2017], hence, sharing models can be understood as partial organizations [cf. Netter et al., 2019].

The aim of this research is to conceptualize the SE within idealistic and capitalistic partial organizations. However, at this point, this work is still in progress. Until now, the research method has not been elaborated. Yet, current presumptions can be drawn. The research methodology will follow a quantitative research approach. Within the scope of a quantitative content analysis, a deductive category system [cf. Früh, 2007; Rössler, 2010] on basis of the framework by Netter et al. [2019], will be designed. Thereby, this study will shed light on the SE and its dynamic features, without falling into prevalent assumptions about the concept and its attributed characteristics. Assuming the SE should be organized in terms of its heterogeneous perspectives rather than narrowed down to a subjective definition [cf. Netter et al., 2019; Acquier et al., 2017], the research will adapt to a conceptual framework approach for quantitative analysis [cf.

Netter et al., 2019].

The sample of this research is limited to the German context and was extracted from i-share.com [I-share, 2019]. With a total of 505 sharing models, a sufficient pool of data is provided. The sample was carried together and analyzed within the scope of a previous university study. Thereby, information of general characteristics of the SE were evaluated, including for example the medium (online vs. offline), the activity (e.g. renting, borrowing, etc.) or the transaction form (payment vs. non-payment) of models as well as the profit orientation (for-profit vs. non-profit) and central resource (commodity vs. service) of the sharing exemplars. The goal of this research is to use the given information in order to differentiate and evaluate the SE in the context of partial organizations and its key organizational elements; namely membership, hierarchy, rules, monitoring and sanction [cf. Ahrne & Brunsson, 2010]. By that, sharing models will be clustered on basis of their organizational similarities as well as differences, resulting in a conceptualization of the SE. Currently, it can be assumed that, in order to support the study's validity, hypotheses will be formed from the theory of partial organizations and applied on the sample. Finally, data will be evaluated through descriptive and statistical text analysis, resulting in an organized understanding of the SE.

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Keywords: sharing economy, sharing models, partial organizations

The good, the bad and the disruptive: how companies deal with potential disruptive technologies

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What is the problem and what is important?

The theory of disruptive technologies, mainly influenced by Clayton M. Christensen combined with a rising technological complexity and diversity in almost all industry sectors, is challenging companies in their decision making on technological investments. Methods, structures and processes seem to be widely applied to support decisions on technologies and technological developments in general. But what are the practices from technology oriented industry leaders to respond to the special challenges of disruptive technologies? This question has been already addressed in an explorative and qualitative analysis among global industry leaders from Germany (see Schimpf, 2015). Furthermore, a study on the practical application of Roadmapping in the industry has revealed insights into the practical application of Roadmapping (Abele & Schimpf, 2016). Based on the results of these studies, a first conceptual model has been developed, helping to identify and evaluate potentially disruptive technologies (Schimpf, 2016). This previous research leads to the question of how companies consider potential disruptive technologies in their technology planning and Roadmapping processes. Based on the theory of disruptive innovation (Christensen, 1992, 1997; Christensen, Anthony, & Roth, 2004; Raynor, 2011), disruption is understood in the context of this paper from a market perspective as a substitute for incumbents solutions, rendering established investments obsolete (see Danneels, 2004, p. 248).

What has been done?

The key question addressed in this paper is, how companies consider the observation, evaluation and integration of potentially disruptive technologies into their technology planning and Roadmapping processes. To gather new insights into this topic, an empirical study has been carried out, starting in September 2016 until the end of February 2017 with over 87 valid responses from industry representatives.

Based on the market-related definition, disruptions can only be identified "post mortem", when the investment from incumbents is or has been destroyed. Thus, selected indicators will be used for the evaluation of the disruption potential of upcoming solutions. Firstly, this includes the question if new approaches primarily target segments that are economically unattractive to traditional R&D and only fulfilling a basic set of user requirements. Secondly, new approaches

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have to be analysed according to the potential for further development following the logic that they are only potentially disruptive if they can be further developed towards the upper-end of the market. Thirdly, cost structures have to be considerably below incumbents' solutions as disruptive innovations most often attract customers through a competitive cost advantage. Finally, a key question to answer is if incumbents are overcomplying customer requirements and thereby opening the market to disruptions from the low-end.

For the execution of the study, hypotheses have been set up based on previous studies and existing literature. These hypotheses include the following:

- Both, large corporations and small and medium-sized enterprises monitor the development perspective of potentially disruptive technologies and thus integrate technology trajectories into their technology planning and Roadmapping.
- There is no common approach existing in industrial companies of how potentially disruptive technologies are further development or integrated into organisational structures.
- A large variety of different approaches exists in responsibilities, processes and continuity concerning the identification, evaluation, storage and communication of information on potentially disruptive technologies.
- Potentially disruptive technologies are handled differently from other technologies in industrial companies.
- Similar methods are applied for the identification, evaluation and integration both, disruptive and sustaining technologies.
- Criteria for the evaluation of potentially disruptive technologies highly vary related to the context of each single industrial company.
- In the phases of storage and communication, potentially disruptive technologies do not vary from other technologies.
- Potentially disruptive technologies are considered in common Roadmaps with all other technologies.

Based on these hypotheses, the questionnaire was set up to compare the monitoring of potentially disruptive technologies compared to the monitoring of sustaining technologies. A major part of the foundation of this empirical study has been provided by the post-mortem analysis of historical disruptive innovations provided in literature (see e.g. Baumann & Hüsig, 2016; Hüsig & Hipp, 2009).

What was found – and what will be recommended

Based on the analysis of the results of the study, the field of criteria and methods that are applied for the identification, evaluation and integration of potentially disruptive technologies is very wide. It seems that the application of a specific set of criteria aiming at the identification and evaluation of potentially disruptive technologies is practically non-existent in industrial companies, considering both, big corporations and small and medium-sized enterprises. The maturity level however for the general monitoring of technologies seems to be on a very high level among participants.

Within the paper, a descriptive analysis of the data collected will be presented. Thus the key objective is to refer to the hypotheses defined and being able to draw additional conclusions. Furthermore, if feasible, statistical correlations will be analysed to draw conclusions on specific methodologies or criteria applied that are related to sectors or sizes of industrial companies.

Literature

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Keywords: Disruption, Disruptive Technology, Field Study

How to align Innovation and Sustainable Development: A Psychological Perspective on Co-Creation Processes

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WHAT IS THE CHALLENGE?

Institutions – may it be universities, NGOs, GOs or business organizations – are increasingly challenged by the requirement of integrating innovation- as well as sustainability-oriented mindsets and behavior into their governance structures in order to leverage and support a "culture of transformation" (cf. HRK, 2018). Yet, the notions of sustainability and innovation at an individual level are sometimes perceived as contradictory, the first one rather being associated with conservation, the last one with renewal, thus triggering antagonistic modes of judgement and behavior (cf. Müller-Christ, 2014). Moreover, tools of Human Resource Management that specifically align learning processes for innovation on the one hand and sustainable development on the other are not (yet) common practice; but co-creation and team-based serious play techniques offer reasonable potential to systematically combine both assets. Although co-creation techniques are becoming more and more popular, inter- and transdisciplinary exchange and research on conditions as well as mechanisms of co-creation and on their impact on sustainable development processes are still scarce.

WHY IT IS IMPORTANT:

How to proactively face the challenge of integrating sustainability and innovation processes? A growing body of knowledge on organizational development for a sustainable future offers feasible insights on how to implement sustainability and innovation in institutions (cf. for example Adams et al., 2016; Veiga Ávila et al., 2017). In addition, a number of use cases on the application of co-creational serious play in different contexts has emerged. Sharing some examples on these issues and addressing the collective as well as the individual level of interconnecting sustainability and innovation – as seen from a perspective of applied psychology – may serve as basis for learning processes that go beyond mainstream and existing paradigms and trigger further interdisciplinary cooperation on the topic.

APROACH:

Therefore, an interactive workshop session is proposed that aims at:

a) showcasing a particular co-creation technique: Lego Serious Play® (LSP),

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b) discussing its psychological mechanisms, implications and effects, especially the role of perspective taking, teamwork and shared mental models (cf. Mathieu et al., 2000) for the "sustainability-innovation-interface" and

c) summarizing findings of several case study examples using co-creative modelling techniques concerned with the question: *How do you sustainable institutions imagine to be like?*

I.e. the workshop includes a practical demonstration of LSP as tool for co-creation, a report on findings from similar workshop settings in order to identify commonalities and a synopsis of psychological approaches toward aligning sustainability- with innovation related processes.

A final part of the workshop will be concerned with the deliberation of inter- and transdisciplinary suggestions for further research as well as application on integrated sustainability-innovation development.

FINDINGS:

As the proposal refers to a workshop session that focuses on interactions and showcases, presentation of particular/singular findings is not the main objective. However, results of the workshop will be wrapped up and documented in order to allow for follow up and further use. Individual and team-based learning processes are at the heart of the workshop, thus stressing practical experience and future-oriented teamwork discussion over specific (research) results.

RECOMMENDATIONS:

The workshop implies the recommendation to apply serious play and other co-creation techniques more frequently and more systematically for organizational development processes aimed at fostering sustainability and innovation. Moreover it is suggested to pay attention to and integrate perspectives of applied (work and organizational) psychology into interdisciplinary research endeavors concerned with (global / systemic) transformation. It is also recommended – and planned to do so in the workshop – to raise the question: Might co-creation techniques even be employed in support of inter- as well as transdisciplinary collaboration and sustainability-related organizational development processes at universities?

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Keywords: organizational development, psychology, co, creation, serious play

The role of skill and technology in re-shaping the work of Clinical Technology

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Introduction

This study is aimed at assessing how the work role of Clinical Technologists has been re-shaped through technological advancements and skill development. According to Calliva (2016) "Clinical Technologists are technologically sophisticated staff members who are intimately involved in many aspects of healthcare". These professionals play an important role in the healthcare system as they are responsible for testing blood, fluid, and tissue samples (Calliva, 2016). Taking into consideration the work of Clinical Technologists, majority of their work involves the use of technological equipment. In the absence of this equipment their role in the health care system will cease to exist. According to Aggarwal (2017:55). There is no doubt that technology has impacted both positively and negatively on the jobs of many people over the various era's. In terms of the positive impact, technology has resulted in improved living standards, increased overall productivity, and the transformation of organizational structure. With reference to the negative impact of technology on employees, labour markets have been disrupted, technology has contributed to income inequality, and the replacement of human jobs by robots. In conjunction with the impact that it has had on the jobs of people, it has also created widespread jobs characterized by higher skills(Cascio and Montealegre, 2016). Even though technology may appear to diminish specific jobs, it may actually provide greater opportunities for the wider population with improved benefits (Aeppel, 2015). Furthermore, author Aeppel (2015) stated "displaced workers with obsolete skills are always hurt, but the total number of jobs has never declined over time". People maybe anxious about new technologies as they feel they do not fully understand them or understand the influence that technology may have on their jobs. Consequently, this impedes their openness to adopt to new technologies.

Purpose

The purpose of this research is to assess how technology has re-shaped the work of Clinical Technologists. In doing so, the researcher will apply the affordance of technology theory, which provides the foundation for this study. The focus of the affordance theory in relation to this study is to emphasis the interaction of technology to the Clinical Technology profession in respect to; the development of the profession, work design, workload, and skill development. This theory further emphasises the affordance of technology to professions rather than the impact. The affordance theory allows one to determine the need and reasoning for various technologies or equipment. Given that technology impacts on the work of Clinical Technologists, this study attempts to solve how the work of Clinical Technologists has evolved as a result of technology and skill development over time.

*Speaker

In line with this conference, only one objective of this study will be explored due to its relevance to the theme of "management of disruptive innovation for sustainable development from global awareness perspective".

Method

Taking into consideration the study at hand, the research design for this study is a case study. A case study design allows the researcher to gain an empirical inquiry by researching these professionals in their real-life context. Harling (2012, p1) defines a case study as "a holistic inquiry that investigates a contemporary phenomenon within its natural settings". Seeing that this study constitutes a qualitative approach, interviews will be used as the data collection tool. The study site for this research study is KwaZulu-Natal, and target population includes Graduate Clinical Technologists as well as key respondents. This study will also focus on expert professionals within the field of Clinical Technology who are the key respondents. Purposive sampling will be used to select participants for the study. According to Palys (2008, p.697) "purposive sampling is virtually synonymous with qualitative research", which is therefore an ideal technique to use since the research being undertaken is qualitative. This study aims to target a sample between 20-30 subjects of Clinical Technologists and a sample of 4-6 key respondents (academics and specialists) from the population of expert Clinical Technologists.

Objectives

As stated previously, this paper will only focus on one of the objectives of this study which is:

- To discover new innovations/devices in the Clinical Technology profession and further elaborate on its influence on job design.

Findings

Seeing that this study is in its literature phase, data collection has not been conducted as yet. The researcher however has identified a key area of interest and revelation related to one of the themes of this conference, 'management of disruptive innovation for sustainable development from global awareness perspective". Research has revealed that new technological advances have been dramatic in the field of Cardiovascular perfusion. During the year 2012, Dr Rakesh Mohanlall who is a Clinical Technologist, brought to South Africa one of the most cutting edge and beneficial technological equipment, called the 3Dimensional Vasculography (3DGV) (Reporter, 2012a). This machine was developed by Dr Rajah Vijay Kumar, who is the chairman and managing director of Organization de Scalene. This organization is a research and development company that is based in Bangalore. The aim of the company is to promote Science, Technology and Medical Engineering on a global platform (Reporter, 2012a). According to the official website of Scalene South Africa (2019), "Haemosis 3dvasculography is a revolutionary non-invasive technique for early identification of life threatening cardiovascular disease". This is the only type of innovation that is able to provide an in-depth breakdown of cardiovascular haemodynamics, electrophysiology and pulmonary and renal functions (Mohanlall, 2014). This machine has the ability to deliver a complete visual of the vital haemodynamic picture of the lungs, heart and blood vessels (Reporter, 2012a). For the first time in history was such a machine able to provide powerful first-hand physiological information to the clinics, intensive care units and catherization labs.

This invention on its own, has assisted Clinical Technologists by equipping them with much more knowledge relating to the cardiovascular system. According to an article in the Phoenix Tabloid, reporter (2012, p23) stated that "the device can empower doctors with more and unique information of the cardiovascular system, which was never before possible non-invasively or invasively using one device". This points out that the information generated by the 3DGV in respect to the cardiovascular system could indeed be generated prior to the existence of this device, however only though the use of multiple devices. Ultimately, many have perceived that with the introduction of this new device among many more, there will be no need for existing older equipment and specific procedures will be replaced. However, in the Sunday Times (2012, p6) Dr Mohanlall affirms that "this is by no means something that will replace other procedures, that is not what we are about. This is something that will enhance how we treat people and that is something we are very proud to be a part of". This study attempts to discover how such innovations have contributed to the field of Clinical Technology in respect to skill development, jobs loss and work design.

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Keywords: Clinical Technology, technology, work design, skill development, medical technology

Exploring Tacit Knowledge Transfer and Innovation Capabilities within the Buyer-Supplier Collaboration: A Literature Review.

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Abstract
The problem

To improve competitiveness through innovation, many organisations are now engaging in buyer-supplier collaborations to facilitate innovative knowledge exchanges. From a knowledge management perspective, knowledge exists in both tangible (explicit) and intangible (tacit) forms, however, it is important for organisations to identify where this knowledge is located so that it can be exploited for organisational success (Chugh, 2017). Many studies have paid more attention to explicit knowledge transfer and operational performance outcomes such as quality, delivery, cost and inventory management within the buyer-supplier collaboration (Giannakis, 2008; Chen, 2015). Despite tacit knowledge being known to be critical to organisational innovation and competitiveness, it has not been fully investigated within the buyer-supplier collaboration context Pérez-Salazar *et al.,* 2017)

Why it is important

Previous research on tacit knowledge transfer through research and development (R&D) have predominantly focussed on the corporate sector, disregarding the supply chain context (Chugh, 2017). Others like Noordhoff *et al.* (2011) who conducted a related study in the supply chain context only focused on the positive and negative side of embedded ties in business-to-business innovation. It is important to assess the facilitators and barriers to tacit knowledge transfer in order to contribute to the discourse on buyer-supplier collaboration and innovation.

Purpose

Noordhoff *et al.* (2011, p.35) define supplier innovation capability as "the ability by the supplier to use the new or improved product, service, or process activities relative to the supplier's

*Speaker

current activities." The definition gives a holistic view of innovation whereby a supplier can innovate in any functional area of the buyer organisation from operations, marketing, human resource, procurement and so forth. The study is guided by two research questions:

> *What are the key facilitators of tacit knowledge transfer in the buyer-supplier collaboration that positively influence supplier innovation capabilities? What are the key barriers of tacit knowledge transfer in the buyer-supplier collaboration that negatively influence supplier innovation capabilities?*

Method

The conceptual paper is based on the systematic literature review of 23 peer-reviewed articles on innovation and knowledge transfer in the buyer-supplier collaboration. Journal articles were drawn from Elsevier/Science Direct, Emerald, Springer, and Scopus.

Findings

Facilitators of tacit knowledge transfer

The conceptual paper reveals that organisation contextual factors such as integrated knowledge management processes, innovative human resource skills, and expertise, innovative organisational culture and information technology are key in supporting tacit knowledge transfer and supplier innovation within the buyer-supplier collaboration (Chang, 2017; Gonzalez & Melo, 2018). For example, Pérez-Salazar *et al.* (2017) argue that information technology supports supply chain integration, which in turn facilitates tacit knowledge transfer within the buyer-supplier collaboration through applications such as discussion boards. In addition, the organisational structure supports collaborative leadership, autonomy and thus helps in leveraging social capital between the parties in a collaborative relationship (Rottman, 2008) as well as the integration of strategy and vision in the organisation (Cavusgil, *et al.,* 2003). Some studies have examined the influence of these contextual factors in isolation, however, Gonzalez and Melo (2018) propose an integrated approach in order to appreciate the influence of organisational contextual factors on the innovation capabilities of the supplier.

Giannakis (2008) suggests top management support, communication, and interaction processes with cross-functional teams as key facilitators of tacit knowledge transfer within the buyer-supplier collaboration. Research further suggests that informal interactions premised on trust (credibility, benevolent and competence) play a key role in transferring hard to encode knowledge because it reduces the power distance among the parties. When a supplier believes in a buyer's trustworthiness in relation to its competence, integrity, and reliability, they expect the buyer to behave in the supplier's interest and transfer accurate and relevant information (Giannakis, 2008; Balboni *et al.,* 2017). Trust further reduces the power distance between the buyer and supplier and hence enhances tacit knowledge transfer and innovation within the buyer-supplier collaboration. Buyer-supplier interactions also enhance communication between the parties (Lawson et al., 2015), which also influences tacit knowledge transfer and innovation. Since tacit knowledge is inherently difficult to codify, informal interactions create an effective avenue for the supplier to leverage the know-how, the experiences and the internalised knowledge from the buyer for innovation purposes (Cavusgil *et al.,* 2003). This is consistent with Noordhoff *et al.* (2011) argument that buyer-supplier embeddedness facilitates tacit knowledge transfer supported by the commitment and trust of the players in the collaboration.

Furthermore, Giannikis (2008) contends that top management support from both the buyer

and supplier is key in developing effective communication channels and cross-functional teams necessary to enhance tacit knowledge transfer and innovation. Top management support from both the buyer and supplier enhances cooperation between individual organisations through socialisation. Individual socialisation reduces cognitive distance and aligns individual knowledge bases with the common objective of the buyer and supplier (Squire *et al.,* 2009). Seidler-de *et al.* (2004) recapitulate that tacit knowledge transfer in innovation management requires personal and informal interaction, open culture and flatter structures.

In addition, the amount of experience that the buyer and supplier have in dealing with each other, commonly known as link duration is a key antecedent in tacit knowledge transfer and supplier innovation (Kotabe *et al.,* 2003). Link duration conditions the effectiveness of tacit knowledge transfer as it enhances trust and reduces the power distance between the parties. However, paradoxically, Squire *et al.* (2009) argue that relationship duration has a negative effect on knowledge transfer because organisations tend to share more knowledge in the early stages of the relationship compared to matured long-term relationships.

Furthermore, Zhao (2013) suggests relationship strength between the parties as an important antecedent of tacit knowledge and innovation within the buyer-supplier collaboration as opposed to a duration only. Relationship strength is the measure of relationship quality between the buyer and supplier and relates to the frequency of interactions and information transfer, bidirectionality of the relationship, confidence in one another and desire to maintain the relationship as opposed to its duration only. Squire *et al.* (2009) underscore the importance of interaction as a facilitating mechanism for knowledge transfer because knowledge resides in individuals and its effective transfer should be grounded in individual interactions between the buyer and supplier employees. However, the performance outcome of such interactions and knowledge transfer should diffuse in the entire organisation for it to be exploited for innovation purposes.

Barriers of tacit knowledge transfer

The paper also reveals that knowledge stickiness is one of the main barriers to tacit knowledge transfer within the buyer-supplier collaboration. Stickiness in knowledge transfer is a metaphor coined by Von Hippel (1994) as the difficulties associated with transferring tacit knowledge because it is socially embedded within the organisation and its practice. Tacit knowledge by nature is difficult to encode (Nonaka, 1991), therefore, as the cost of encoding increases, stickiness also increases. Knowledge stickiness can be caused by both organisational and personal factors. Organisational factors may relate to knowledge integration challenges among others, while personal factors may include lack of motivation to learn, often because of the poor buyer-supplier relationship among others (Schuller, 2014). However, Li (2012) conceptualises a curvilinear relationship between knowledge stickiness and supplier performance. He argues that high levels of knowledge stickiness only enhance supplier capability up to a certain point, thereafter; it decreases performance due to diminishing returns. The argument being advanced is that difficult but achievable goals may motivate suppliers to overcome stickiness challenges and solve the problem thereby acquiring the needed tacit knowledge. However, if this difficultness becomes insurmountable, it becomes a barrier to tacit knowledge transfer and learning.

Furthermore, Saini *et al.* (2019) reveal that supply chain fragmentation and the traditional organisation structures, and working processes are some of the barriers of tacit knowledge transfer and supplier innovation capabilities. These barriers to tacit knowledge transfer and indeed innovation are more prevalent in the construction sector where supply chain integration has not significantly evolved over the years. In addition, the complementarity of skills between the buyer and supplier is also cited as another notable barrier to knowledge transfer even though it supports supplier development (Lawson *et al.,* 2015). While differences in the types of skills

possessed by the buyer and supplier may hinder the smooth transfer of knowledge in the short term, it is a great fertile ground for learning from one another in the long term.

Conclusions and recommendations

The study contributes to the literature by providing a holistic approach of the facilitators of tacit knowledge transfer, which is required to enhance tacit knowledge transfer within the buyer-supplier collaboration to support supplier innovation capabilities. Overall companywide integration of knowledge management processes, supplier integration, effective communication and learning culture among others, create an environment most supportive of innovation success. Buying and supplying organisations should endeavour to address the suggested facilitators while suppressing barriers of tacit knowledge transfer prior to engagement to support innovation.
The study further contributes to practice by presenting the main facilitators of tacit knowledge transfer for managers/practitioners to consider in the buyer-supplier collaboration which can influence supplier innovation on projects such as new product development. The study further proposes a model that will be tested quantitatively in the subsequent empirical study.

Keywords: tacit knowledge transfer, buyer, supplier collaboration, tacit knowledge facilitators, tacit knowledge barrier, innovation, supplier capabilities.

Fostering Creativity and Innovation among Indigenous Ghanaian Banks: The Role of Formal Institutions

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Extended Abstract: "Work in Progress"

Introduction

Innovation is very crucial, complex and major issues in entrepreneurship activity for firm's success and performance (Chadee, 2013; Lages, Silva, & Styles, 2009; Martínez-Román, Gamero, & Tamayo, 2011); firms growth (Love & Roper, 2015) and; competitive advantage and sustainability (Martínez-Román, Gamero, Delgado-González, & Tamayo, 2019; Thomas, Hunger, Hoffman, & Bamford, 2015). Paucity or stagnation in firm's innovation activity(product or service) may lead to loss of competitive advantage (Thomas et al., 2015) This is because innovation increases organisational performance (Love & Roper, 2015), and that firm's competitiveness and innovations, and innovative complexity and sustainability may be influenced by the external institutional factors (Qu & Wei, 2017; Ullah, 2019; Wellalage & Fernandez, 2019), which are mostly difficult to assess (Martínez-Román et al., 2011).

Banking sectors are regulated by the formal institutional framework and regulatory bodies. The policies and requirement of these formal institutional regulators may influence the bank's innovation activity, strategic direction and choices and, business sustainability. Over the years, the banking industry in West Africa, and Ghana in specific, was relatively easy for new entrants (Nyantakyi & Sy, 2015). Easy in an entry recorded the proliferating of new banks establishment in the Ghanaian banking sector and instances cases of mismanagement of depositors' money among the baking industry.

To sinew the balance sheets of Ghana's banking industry, Bank of Ghana in September 2017 introduced the Internal Capital Adequacy Assessment Process (ICAAP) under the Basel II to increase the minimum capital requirement for all banks from GH120 million (US 27.5M) to GH400 million (US 91M) by December 2018 (GFS 2017). Notwithstanding the agitation from the local banks on the treble minimum capital requirement, the regulatory body insists the new directives will help streamline the banking industry and "further develop, strengthen and modernise the financial sector to support the Government's economic vision and transformational

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agenda" (GBS, 2018:2). Amidst the recapitalisation trajectory, the hardest-hit banks were the indigenous Ghanaian banks. For example, with the recapitalisation, five (5) indigenous banks (Royal, Beige, UniBank, Sovereign and Construction bank) were collapsed and merged as Consolidated Bank Ghana (CBG) and now owned by the state. UT and Capital bank acquired by Ghana Commercial Bank (which is state own), GN Bank lost it license as a full bank to savings and loan and, Omni Bank merged with Sahel Sahara now Omni-BSIC Bank, etc. Interestingly despite the 'fall' of some indigenous banks, other banks stood tall in the recapitalisation trajectory. For example, Fidelity bank, Cal Bank, Universal Merchant Bank, etc. So the question now is what different or 'magic' or 'Disruptive' strategy did these banks adopt to survive and sustain their business to meet the new minimum capital requirement despite the changes in the formal institutional environment to triple minimum capital within the space of one year?.

Problem Statement

Information on institutional enablers or impediments on innovation is copious in the extant literature and mostly researched in developed and emerging countries and mainly focus on firm's innovation, export and growth, innovation and internationalisation, institutions, Foreign Direct Investment (FDI) and innovation, open innovation and firm's export, formal and informal financial sector and impediments on innovation (Love & Roper, 2015; Martínez-Román et al., 2019; Wellalage & Fernandez, 2019; Zhu, Wittmann, & Peng, 2012). Varied empirical views have been expressed by current and canonical scholars on institutional studies and innovation. Some researchers' find positive relations between government assistance, property rights and network partnering on innovation (Qu & Wei, 2017); positive influence and greater significant effect of formal financing and informal financing on firm's innovation respectively (Wellalage & Fernandez, 2019); whiles others find positive effect of formal financing on firms innovation and insignificant relations between informal finance and innovation (Ullah, 2019) and; positive impact between network partnering and government support on firm's innovation (Love & Roper, 2015). However, despite the burgeoning research on institutions and firm's innovation it appears extant literature tends to focused mainly on developed, Western European (Love & Roper, 2015; Martínez-Román et al., 2019); Asian tigers and China (Qu & Wei, 2017; Zhu, Wittmann, & Peng, 2012) and; emerging countries such as Russia, Czech Republic (Wellalage & Fernandez, 2019) neglecting developing countries (Ullah, 2019) and indigenous firms in particular. In addition, there is a limited study on mitigating strategies for institutional constraints. The study therefore examines how the formal institutions influence the indigenous banks disruptive strategies to meeting innovative within a limited time frame.

Importance and contribution of the study

Ghana bank recapitalisation agenda have affected indigenous local banks to either merge, liquidate, or acquired by other banks. The research focuses on formal institutional strands influencing banks innovation activity and elucidates the disruptive strategies adopted by the banks in meeting institutional demands such as new capital requirement within a limited time frame. The importance of the study is to garner closer comprehension and challenges indigenous banks experience in the recapitalisation trajectory, and how its innovation agenda impact their strategy adoption. This study contributes to the scanty literature on formal institutional influence on banks disruptive strategies and innovation activity.

Progress report and Expected Outcome

The study is at the data collection stage. Currently two indigenous banks have been interviewed. The researcher hopes to complete the remaining three banks and submit the first draft of the work by the end of October 2019. The result from the two interviews reveals, in the quest of indigenous banks complying with formal institutional requirement (new capital requirement), they implement varied strategies which were 'disruptive' in nature. The expected findings depict a positive relationship between formal institutions and banks innovation.

Theoretical View: Institutional-base View Theory

The key area of the institutional-based view theory is to determine interaction between organisational performance and firms' external environment. According to (Greenman, 2013; Jain & Sharma, 2013), the central argument of applying institutions in entrepreneurship concludes that entrepreneurs must operate within the existing regulated institutional framework basically to gain legal approval and resources from germane authorities and interested parties. Institutional view theorists were of the view that firm strategic choices are determined by the interaction between the organisation and the environs it is situated (Peng, Weng & Jiang 2008) and that, firms optimise their performance based on the context they operate (Peng & Luo, 2000).

Methodology

Since this study is under-explored area, an exploratory, qualitative research design, and semi-structured interview will be employed to case study 5 indigenous Ghanaian banks. The purposive sampling technique will be used to select owner manager or and relevant participants for detailed interviews. Data will be gathered through interviews and narrative enquiries. All interview sessions will be recorded and field notes taken which will later be transcribed and analysed using a thematic analysis.

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Keywords: Formal institutions, innovation and, disruptive strategies

HR Analytics: An Evidence-Based Review of Performance Evaluations

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PRINCIPAL TOPIC

Since decades backward, the most important resources of organizations are known to be their human resources (HR), sometimes referred as Human Capital (HC) (DeNisi et al, 2014; Hitt and Duane, 2002; Weena Yancey M Momin et al, 2016). Even beyond that, HR have been identified as the lifeline of the organization and when it reaches the highest level, so does the likelihood of the organization (Fiore, J., & Houston, J., 2014; Weena Yancey M Momin et al, 2016). In fiercely competitive environment however, organizations still find it extremely difficult to recruit, motivate, develop and retain competent manpower (Pahuja and Dalal, 2012). In this context, HR Analytics are seen as promising tools for improving performance and gaining competitive advantage and more an more organizations are adopting them (Charlwood et al, 2016; Davenport, 2017; Pahuja & Dalal, 2012; Weena Yancey M Momin et al, 2016). Furthermore, a special issue from Human Resource Management Journal (Charlwood et al, 2016) stressed that HR analytics is as a must have capability that will ensure HR's future as a strategic management function while transforming organisational performance for the better. While the fact that academics do have an important role to play in bridging the analytics/HR gap (Charlwood et al, 2016) now seems to be doubtless, organizations experience a sever lack of tailored skills and expertise in advanced analytics tools, namely statistical and econometric techniques (Aral et al., 2012 and Charlwood et al, 2016). Cascio and Boudreau (2011) argued that these advanced techniques are necessary to avoid bias and confounding by disentangle correlation from causality through analysis of experiments and quasi-experiments.

In these circumstances, several scholars are calling for sophisticated approaches able to permit a better understanding of HRM and performance relationships (Nolan et al, 2016; Davenport, 2017; Pahuja and Dalal, 2012) and other have stressed the scattered nature of our knowledge of this relationship (e.g. Marler and Boudreau, 2017; Huselid, 2018). Following Marler and Boudreau (2016), we contend that one of the most promising and innovative way for deepening or understanding of cause-effect relationship between the use of HR Analytics and company

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performance (Aral et al., 2012) in HR research is by using HR Analytics.

Thus, based on the above-mentioned call and gap in HR literature, the purpose of this paper is to contribute to better understanding of HR Analytics and the strategic HRM literature by investigating the relationships between HR Analytics and company performance.

METHODS

Similar to prior research approaches (Rousseau, Manning, & Denyer, 2008; Marler & Boudreau), we are performing an evidence-based review using an integrative synthesis of published peer-reviewed literature on HR analytics.

Our literature search approach follows the methodology used in Marler & Boudreau, 2017. Indeed, we are conducting searches in three major multidisciplinary publication databases: Academic Search Complete, Business Source Complete, and Scopus. This leads us to start scanning literature on a large scale (e.g.: more than 7000, academic references, more than 1600 scholarly business journals and indexes over 4300 titles, Scopus indexes, abstracts and provides the contents of 21,000+ journal titles from 5000 publishers). Accordingly, our search protocol across these databases involved searching article titles for the terms 'HR Analytics', 'Talent Analytics', 'Workforce Analytics', 'People Analytics' or 'Human Resource Analytics'.

The time period covered in our search identifies 2015 as cutoff point. Indeed, Marler & Boudreau, 2017 has covered the time span before and up to 2014. Then, applying the same sample search criteria, we generate published peer-reviewed researches from 2015 to present.

PRELIMINARY RESULTS

Preliminary results indicate an increasing interest in HR Analytics (Charlwood et al, 2016). Since Marler and Boudreau (2017) which we select as a major contribution to the HR Analytics literature, a couple of special issues targeting HR Analytics has been published. Illustrative examples, among others, are the following two which gather more than 15 individual articles:

- Human Resource Management Journal (Charlwood et al, 2016)
- The International Journal of Human Resource Management: Digitization and the transformation of human resource management (2018)

This dynamism represents a key evidence regarding the important popularity gained by HR Analytics in the era of HRM recently. Of note, the distribution of the published articles points out a low yearly publication trends during the 2000's. Then after 2010, interest in HR Analytics increases noticeably (Marler and Boudreau, 2017).

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Keywords: Human resource analytics, workforce analytics, HR metrics, strategic HRM, talent management, Performance

Engaging companies for urgency on sustainability

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The call for companies to adopt more sustainable environmental or social policies is generally made by governments in the form of laws and regulations or other stakeholders influence in order to accommodate industry demands or markets tendencies. However, more and more often, companies also become a direct target of extra pressures of less conventional actors such as activist groups in order to adopt additional sustainable practices or at a faster pace. Because of the high impact that companies have on some sustainability issues and their ability to effectively make a real difference in the terrain, sometimes faster and broadly than governments, they have become a growing target of activist groups' campaigns. However, despite some of these campaigns have proven to impact businesses and industries policies, activist groups are frequently considered in organizational literature as powerless or illegitimate, becoming marginalized by theory and limiting the knowledge about its influence process.
In this paper we analyze the case of a particular campaign led by an activist group in order to reduce the pesticides used in the production of fruits and vegetables in France. This campaign targeted France's largest supermarket chains, a major stakeholder of fruits and vegetables producers, influencing their purchasing policies and ultimately the use of pesticides in the field. We use stakeholder theory, agenda-building and social movements theory as lens of analysis of the process of how this activist campaign was able to influence companies' policies and became a case of collaboration and improvement of the industry norms.
We are currently conducting interviews with major decision-makers of the activist group and of the target companies. By the conference's date we expect to have collected all relevant data and be able to present the final findings and conclusions of this case.

Keywords: business sustainability, stakeholder theory, agenda, building, social movements theory, case, study

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The Network Science, Art and Design within the Fraunhofer-Gesellschaft

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What is the problem?

During so called Anthropocene [1] the climate change [2] is very possible caused by anthropogenic activities and evokes more complex questions, to solve tensions becoming from processes of changing in fields of economy and society. To handle complex questions, specific such related to commons like "the earth", stakeholder-discussion, based on facts, will be a good way for negotiation aims of change processes.[3] The intertwined action of methods from physical sciences and the arts should be fostered, to solve complex and, so called, wicked problems[4]. But, the meaning "Two Cultures" [5] stands for thesis, that sciences and humanities are split in two cultures and this thesis is not falsified till today.

Why is it important?

Future compatible approaches to solve tensions, caused by climate change, show us the need of transdisciplinary collaborations - also to enable active use of tacit knowing [6]. It is of relevance, find and practice usable forms of collaboration to integrate methods and findings from all fields of sciences.

What did you do?

Like findings in sociology of science are showing can networks bring effective conditions to solve complex questions [7]

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. has initiated a Network of Science, Art and Design, to foster collaboration between sciences and art.[8] Aimed on one side is the development of collaborative strategies, but on other side to finding future relevant questions regarding global societies. The arts, but also the disciplines of design, uses methodology that sometimes is diametral oriented to methodology used in sciences, like one can show by example of solution- vs. problem-oriented approaches. To investigate, how interdisciplinary networks will establish, specific formats of interdisciplinary collaboration was identified and are now in experimental field tests:

> "Artist in Lab – Duality" as residencies programme will foster the proactive partnering activities from Artists and Designers to institutes, that are organized in Network Science, Art and Design. This format gives highly degree of freedom regarding methodology an

*Speaker

choose of task.[9]

"Pioneers Challenge" is giving a specific task and uses a moderated partnering, by matching applicants from outside and inside Fraunhofer Gesellschaft in to teams. This format is working under a precise task and gives freedom to choose methodology.[10]

"Fundus" is listing collaborative projects, initiated or done by involved Fraunhofer Institutes. Hereby aimed is the inspiration to follow ups or development of new research designs, respecting collaborative approaches. This format addresses Fraunhofer Institutes, to reflect their interdisciplinary projects internal. It is planned to publish the fundus successive, in concordance to demands of saved intellectual property.

During the presentation a detailed view inside the format "Artist in Lab – Duality" will be given.

What did you find?

All three formats at minimum had one run during the actual project time of 18 months. Because of needed proactive activities by Fraunhofer employees, one can say, that the formats are useful. During first call "Artist in Lab – Duality" reached applications also showing a good acceptance outside the Fraunhofer Gesellschaft.

What do you recommend?

When the three formats will be continued, accompanying research is recommended, to foster findings on indicator systems to monetarise the benefits from art and science collaboration. The seen pull effect, by highly rate of proactive applications to residency programme, should be payed focused attention. Proactive project development by Artists and Designers should be intensified and cultivated. For this reasons R&D entities should proof their channels for communication to the public, not only to foster fact-based stakeholder discussions, also to define further ways of broader participation on scientific findings.

Keywords: Network, collaboration, applied scientific research, art, design

Knowledge diversity and firm sustainable innovation capability: The moderating role of network structure

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Recently, the Chinese government has continuously dedicated to environmental protection, inducing firms in traditional energy industry to face transformational challenges. Continuous innovation, having a vital role in the economy development, is the foundation of the high-tech firms that are characterized by high technical content, wide coverage, high correlation, and strong driving force. This paper takes the new energy industry as an example to analyzed some factors affecting firm sustainable innovation capability in alliance innovation network. Previous studies have documented the importance of resource attributes for firm sustainable innovation, and empirical evidence suggests that companies continuously accumulate their own innovation capabilities and relevant resources to face environmental changes. Several factors may affect sustainable innovation, for instance R&D expenditure, knowledge stock, knowledge diversity. Among these, researchers highly focus on the knowledge characteristics because it can directly affect firm sustainable innovation capability. Due to the immature development, Chinese new energy industry increasingly absorbs diversity knowledge and achieve sustainable innovation by undertaking strategic alliance. In a highly dynamic technological environment, few firms possess all the internal capabilities required by successful and continuous innovation. As a result, firms frequently seek for external sources to fulfil their knowledge requirements. Prior research has shown the importance of strategic alliances as a mechanism for learning and accessing external knowledge, since the innovation alliance network formed by alliance firms enables cross-boundary exchanges, knowledge sharing, and cooperation research to reduce R&D risks and cost. Moreover, evidence suggests that innovation resources of alliance firms can be promoted by alliance innovation network to spread within networks, and heterogeneous knowledge of other firms can be absorbed either in alliance to enrich their knowledge reserves and improve innovation capabilities. Therefore, some network structures were considered to explore the relationship between knowledge characteristic and sustainable innovation capability.

Overall, previous research has examined the effects of knowledge characteristics on firm sustainable innovation, but there is little work in testing the impact of knowledge diversity on firm sustainable innovation. Besides, previous articles have studied the influence of network structure on firm innovation performance. However, few works explained the role of network structure in the relationship between knowledge characteristics and firm sustainable innovation capabilities. Therefore, remains a question which is investigated by our work: How the network structure influences the relationship between knowledge characteristics and firm sustainable innovation capability in alliance innovation networks? so there are two sub questions would be

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explored: (1) Does knowledge diversity influences firm innovation sustainability? (2) Do the network structure attributes (the degree of tightness of ego-networks, the degree of openness of ego-networks) influence the relationship between knowledge diversity and firm sustainability innovation?

Considering both theoretical and practical evidences, in this research, knowledge diversity was chosen to characterize the resource attributes. For the network structure attributes aspect, ego-network density and honest broker index were chosen to characterize the degree of tightness of ego-networks and openness of ego-networks respectively. Here are the three hypotheses concerning the main question. (a) hypothesis1: knowledge diversity positively influences firm sustainable innovation. (b) hypothesis2: ego-network density negatively influences the relationship between knowledge diversity and firm sustainable innovation. (c) hypothesis3: honest broker index negatively mediates the relationship between knowledge diversity and firm sustainable innovation.

Chinese new energy industry alliance data was collected from 2009 to 2016, and was cleaned by us. In addition, we also collected a large number of patent data of firms, including the patent applications data (from *INNOJOY enterprise database*) and the top four IPC subcategories data (from *SANAP enterprise database*). These data are used as the raw data of firm sustainable innovation and knowledge diversity. According to international practice, the alliance innovation network is divided into a time-window every three years, thus, we divided 2009-2016 into 2009-2011, 2010-2012, ..., 2014-2016, a total of six time-windows. Then, we used MATLAB software to generate 6 adjacency matrixes for the new energy industry's alliance data. Finally, we used UCINET software to calculate the network structure index, and the index values of the research variables, e.g., ego- network density, honest broker index, and reach centrality. Correlation analysis and negative binomial regression analysis were carried out with STATA.13 software to test the three hypotheses.

The findings show that knowledge diversity has a significant positive impact on firm sustainable innovation, indicating that the more knowledge resources a company has, the more it is conducive to sustainable innovation. Ego-network density plays a negative role between the relationship of knowledge diversity and sustainable innovation, suggesting that ego-network density is too high, the promotion of knowledge diversity on firm sustainable innovation will be weakened. Similar to ego-network density, honest broker index also has a negative influence the relationship between knowledge diversity and firm sustainable innovation. Therefore, the three hypotheses are all supported.

This work contributes to a new perspective of the alliance innovation network to explore some factors that impact on firm sustainable innovation capability. We demonstrated that firm with diverse knowledge can improve firm sustainable innovation capability. Therefore, firms actively embedded in the alliance innovation network can increase knowledge accumulation to promote their sustainable innovation. Moreover, firms with low ego-network density have sufficient freedom to absorb heterogeneous knowledge of other partners in an alliance innovation network, and will not be restricted by the lock-in effect. Firms with higher knowledge diversity should avoid to embed in high density, familiar, and close ego-network, and should be actively explored the new path to achieve independent innovation. To be successful, alliance firms ought to control the number of times they become honest broker. When the value of honest broker index is small, firms will have plenty of energy to manage the relationship with the surrounding cooperative partners, which is easier to obtain mutual trust and resources of the partners to enrich their knowledge diversity and promote firm sustainable innovation. The results have a theoretical and practical significance for the Chinese new energy industry firms that conduct alliance activities.

Keywords: knowledge diversity, firm sustainable innovation, ego network density, honest broker index, alliance innovation network

Disruptive Innovation Strategies: A Case of Emerging African Markets

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Introduction

The problem of opportunities for enterprise and innovation has continued to attract interest in recent years. Entrepreneurial opportunity and innovation results in disrupting the industry (Slvarez and Barney, 2007). Innovations in entrepreneurship are important because they disrupt markets as new opportunities and methods of doing business are introduced. Disruptive innovations change the terms of competition, reaching new customers, disrupting new incumbent firms or opening new markets (Hang and Garney, 2010). This paper reviewed the already existing literature on entrepreneurial innovators for example Uber and analyzed how they organize resources for their ventures. This research found that Uber allowed people to move easily, whether across town or towards their dreams using their ride services. This research found that the company has created billions of moments of human connections around the world with their smartphone application device that allows people to tap a button to get a ride. Based on the supporting evidence from the research findings, this study recommend that emerging markets need to create partnerships with other entities and institutions, so as to find solutions and innovate around the lack of certain market complementarities essential to conducting business.

Review of Literature

Disruptive Innovation

The term 'disruptive innovation' was first coined by Clay Christensen in his seminal work *The Innovators Dilemma* in 1997, in which he introduced the theory of disruptive innovation. Disruptive innovation is defined by Christensen et. al., (2015, p. 56) as, "an innovation that transforms an existing market or sector by introducing simplicity, convenience, accessibility and affordability where complication and high cost have become the status quo – eventually redefining the industry". Cowden (2013) posits that disruptive innovations are simple adaptations to existing technologies that appeal to customers who were not previously enticed to the products. From a market standpoint, this would be considered to be low-end encroachment, which arises when a higher volume of customers is targeted by the provision of a cheaper, simpler version of an existing product or solution (Schmidt and Druel, 2008).

Descriptive of App-Based Taxi-Cab Services and their Growth in Africa

Globally, the transport sector has been disrupted by the entrance of shared economy or ride-

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sharing transport service providers like Uber, Taxify and Sidecar (Pursel, 2016). Uber has entered Africa and shaken up the transportation industry. The concept has spread across the continent. According to United Nations (2017) Uber is operating in 15 major African cities, with some 60,000 drivers in Egypt, Ghana, Kenya, Morocco, Nigeria, South Africa, Tanzania and Uganda. In addition to, there has been a few local entrants such as Snappcab, Zebra cabs (which has migrated from being a traditional to an app-based cab service) and Ryda but these players do not appear to have made significant inroads in the market (United Nations, 2017). The emergence of such firms threatens to reduce metered taxi associations' participation in the provision of private transport / cab services (Pursel, 2016). These service providers are efficient and rely on a smartphone application that uses the customer's smartphone to detect their specific location using the Global Positioning System (GPS), and instantly connects the customer to the nearest available driver. By using location detection, customers easily connect with the nearest driver in a short period of time. This innovation is therefore attractive to consumers as it leads to a shorter waiting and travel time rendering the service more reliable than traditional metered taxis (Pursel, 2016). App-based applications work in four stages as illustrated in figure 1 above. The first stage is where customers use a smart device to request for a ride. In stage two, the application connects the nearest driver with the customer using GPS. The car is delivered in stage three and the electronic payment is made in the last stage, once the passenger exits from the car. Stage two and stage four are automated by software.

Objectives of the Study:

- To gain a greater understanding of disruptive innovation within an emerging market context, specifically in Africa.
- To explore how the recent rise of Uber is perceived by consumers.
- To discuss disruptive innovation strategies.
- To determine creative opportunities presented by Uber.

Methodology

The purpose of this paper was to determine disruptive innovation strategies, specifically in emerging markets. This was best done through a qualitative research method. According to Langos (2015) basic advantage of this method, which also constitutes its basic difference with quantitative research, is that it offers a complete description and analysis of a research subject, without limiting the scope of the research and the nature of participant's responses. This paper employed a thematic analysis approach to discuss disruptive innovation strategies and how it relates to entrepreneurship. A thematic data analysis is conducted using three steps: developing and applying a code; identifying themes, relationships and patterns and finally summarizing the data (Dudovskiy, 2016).

Research design

A case study approach has been used in this study. The case study was on a single multinational corporation (MNC) which expanded into Africa, namely UBER. The researcher observed that UBER provided the perfect opportunity as its business model and product itself are both regarded as disruptive innovations.

Desktop research

This paper is based on literature. Therefore, secondary data – desktop research was used to review previous research findings to gain a broad understanding. The researcher found and examined several relevant sources that contained useful information about disruptive innovation or technology strategies in context to UBER.

Preliminary Findings

Uber allow people to move easily, whether across town or towards their dreams using their ride services. The company has created billions of moments of human connections around the world as people through a tap button to get ride allowed them to go all kinds of places in all kinds of ways with the help of this technology (Uber, 2019).

UBER Offerings

UBER Eats: Uber eats allow customers to get food they love delivered. Customers order from their favourite restaurants, online or in-app. The restaurants will prepare their order, and a nearby Uber delivery partner will deliver it to their door (Uber, 2019).

UBER Freight: In addition, Uber allows flexible shipping, anytime. Uber Freight is a free app that matches carriers with shippers. Shippers tap a button to instantly book the loads they want to haul (Uber, 2019).

UBER for Business: In addition, Uber simplifies how business gets around. Whether it is employee travel or customer rides, Uber for Business gives customers an easy way to manage their transportation needs. This service is built for work, it offers a clear view into employee trip activity with automated billing, expensing, and reporting (Uber, 2019).

UBER Health: Moreover, this is a reliable, comfortable rides for patients. According to Uber, they have partnered with healthcare organizations to provide flexible ride-scheduling options for patients, caregivers, and staff. Healthcare professionals can schedule rides for patients and caregivers going to and from the care they need, all from a single dashboard (Uber, 2019).

UBER latest offerings

Uber Bike: Customers can use their Uber app to rent an easy-to-use electric assist bike provided by JUMP. Uber Bike is currently available in United States San Francisco and Washington, DC. (Uber, 2019).

Uber Submarine (scUber): With this latest offering riders can experience this incredible underwater world exclusively through the Uber app. scUber showcased the world's largest living structure as a biodiverse playground, rich in marine life and offering remarkable underwater experiences (Uber, 2019).

- **UBER future**

Uber Self-driving: The road to self-driving vehicles is the future plan of Uber. This innovative idea is dedicated to building safe, reliable, and cost-effective self-driving technologies.

With teams in Detroit, Pittsburgh, San Francisco, Tempe, and Toronto, the group is bringing self-driving cars and freight trucks to the Uber network (Uber, 2019).

UBER Elevate: The future of urban air transport. Uber Elevate is already exploring the barriers that they need to overcome to make daily air transportation a reality. Elevate's mission stands for making far-reaching changes to riders' lives-like quicker daily commutes, less traffic congestion, and cleaner air (Uber, 2019).

Conclusion

In concluding remarks, disruptive innovation is different in emerging markets in both the manner it disrupts, the nature of the disruption and the need it speaks to. This paper has shown that Uber has essentially wiped out the taxi-cab industry but in doing so it forced them to either update and compete or integrate. Uber is also a disruptive innovation in the sense that it is opening up new markets with its various forays. Disruptive innovation that transforms or creates new markets has become the Holy Grail for many companies. The African market holds a lot of potential and has been regarded as the next big growth frontier for some time (Barbour, 2017). Despite this potential, there are challenges and one such challenge is appealing to the market or finding a foothold within the African market. Based on the supporting evidence from the research, this study recommended that developing markets need to create partnerships with other entities and institutions in order to find solutions and innovate around the lack of certain market complementarities essential to doing business.

Keywords: Disruptive innovation strategies, Uber, Uber offerings, emerging markets

2. Understanding and Fostering Imagination for Responsible Innovation. Foresight, Fiction, Ideas and Narratives and Their Influence, Exploitation and Potential.

Online Disruptive Technologies and CVE: Global Best Practices and Potential for Implementation in Bangladesh

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As access to the Internet and social media has become ubiquitous, violent extremist groups all over the world have begun to capitalize on these channels to amplify their reach and networks. We now know that several perpetrators involved in extremist attacks in the United States, United Kingdom, Russia, Spain and, most recently, Sri Lanka, were radicalized online and also planned and executed the attacks with the help of internet and social media. Acknowledging this reality, governments, NGOs, civil societies, tech companies and social media companies worldwide are increasingly have begun focusing their countering violent extremism (CVE) efforts in the digital space.
While disruptive digital technologies are rapidly being developed and deployed by different stakeholders across nations, their potential and effectiveness in countering the threats of violent extremism are still unclear. There is a considerable gap with regard to understanding the landscape of digital-based CVE interventions and their relative strengths and weaknesses, which could greatly help other nations replicate and adapt, and also enliven the academic literature in this space.

In light of the said gap in existing knowledge, this research aims to canvas digital or online-based CVE technologies deployed globally, identifying the best practices which have been deemed to be successful. The second objective of the study is to investigate the current CVE interventions in Bangladesh and drawing on international experiences, evaluate the scopes of disruptive CVE technologies that would have high potential for success in Bangladesh, which is where the authors are from.

In terms of methodology, this research has utilized a mix of detailed secondary research and expert interviews. The secondary research entailed analysis of existing literature relevant to the themes of the study, including journal articles, project reports, news articles and so forth. With the aim of contextualizing the research for Bangladesh, 15 in-depth interviews of stakeholders have been conducted. These stakeholders span influential persons with Bangladeshi academia, civil society, and policy-makers.

In this study, the digital/online-based CVE interventions, particularly that have had a disruptive impact vis-à-vis existing technologies, have been reviewed. A wide net has been cast

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on initiatives deployed globally and a distinction has been made between positive measures and negative measures. The negative measures are the ones aimed at blocking, filtering or removing extremist content found online. This study identified "eGLYPH technology" and "artificial intelligence" (AI) as relevant to negative measures. "eGLYPH" makes use of a "hashing" technology for attributing unique digital fingerprints to the extremist contents and removing all the versions of those contents from the web. This technology also takes it one step further through preventing any version of the pre-flagged contents from being ever uploaded. Similarly, AI technologies are being used by different agencies and particularly social media companies for tracking down and blocking existing extremist contents online. The mass search-engines like Google and social media channels like Facebook, YouTube, Twitter, and other mass-used websites being threatened by the spreading of extremism are heavily relying on AI technologies as they have to handle an enormous flow of data on regular basis.

On the other hand, the "Redirect Method" has been labelled as a positive measure in this study. The positive measures are the ones that seek to counter extremist narratives with the help of alternative narratives. The Redirect Method works through identifying potential IS recruits and enthusiasts and redirecting them towards a pre-prepared playlist of alternative narratives whenever they search for any sort of extremist contents online. Through this process this method aims at breaking the possible echo chambers and does not involve removing any extremist propaganda available online. However, an important point to be noted here is that since the existing body of research urge the need of both types of strategies for successfully countering violent extremism, the potential efficacy of none of these strategies have been denied in this report.

This study has also considered the present situation with regard to deployment of mobile-based apps or technologies in the field of digital CVE strategies. From research, four major mobile apps were found to be active currently. These apps are aimed at sharing alternative narratives, awareness building through knowledge sharing and creating common platforms for collaboration among CVE activists. These apps have been associated with the positive measures as well.

The research also encompasses an overview of the CVE scenario in Bangladesh. Factors driving extremism include gaps in knowledge, an inequitable education system, absence of scope for information verification, lack of social media literacy, emotional wellbeing issues, lack of opportunities for organized civic engagement, and so forth.

The study suggests that, although the Government of Bangladesh has declared zero tolerance towards violent extremism and has fared impressively with regard to counterterrorism activities, a substantial gap exists in the field of CVE strategies from the overall community of stakeholders at large. The government has a focus on kinetic counter-terrorism, if you ask the question of where resources ought to be deployed first and foremost in light of incidences of violent extremism from 2013-16. There have been some steps towards government-led and privately- initiated digital technologies and mobile apps, but this is a huge growth area. This is also a feasible space for growth given the government aims to create a "Digital Bangladesh" by 2021.

In this context, this study has put forward recommendations for creating opportunities for knowledge sharing among nations to learn each other's best practices and to replicate the effective ones. Last but not the least, the research also highlights particular digital interventions that may have high potential for success in the context of Bangladesh. These programs include developing online courses for promoting awareness; dissemination of positive messages using digital technologies and media; creating an online platform with the trained and legitimate religious leaders for preaching authentic religious narratives; developing an e-platform or website for verifying the information found in the internet and social media channels; and last but not the least, online or mobile-based games for reaching out to a broad section of the population

and instilling CVE skills.
This research also suggest that given the current administrative framework and policy establishment in Bangladesh, CVE interventions may turn out to be most successful if carried out only by credible sources like the government although in case of some other countries, government-led CVE strategies have met with limitations. This study also underscores the importance of collaboration among government, civil society, NGOs and academia stakeholders for developing and operationalizing an integrated plan of action for CVE. Although violent extremism must be recognized as a global threat, the war against this menace needs to be fought at the local level while embracing the diversities of different contexts and inspiring cooperation among nations.

Keywords: CVE, Disruptive technology, Violent extremism

Investigaton of Women in Tech as Responsible Innovators

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The eternal search for future technologies or the technology for a socio-technical future is more and more characterized by the integration of ethical and political resentments (Lente 2017). This is one of the reasons why the term "responsible innovation" is increasingly being used (Stahl 2011). Responsible Innovation as an approach addresses issues related to major social and environmental risks and uncertainties in complex innovations (Setiawan, et al. 2019). The assessment and foresight in the design of technological innovations seems to be an essential element (Schomberg 2013). This inevitably leads to the question: who can initiate and promote these responsible innovations? Who has an imagination for the future and the distribution of their future technology? Professionals with technical backgrounds (computer scientists, physicists, engineers, etc.) are thus one of the most important sources of value for companies and society (Agarwal et al. 2018). Can these professionals create the responsible way of companies and society?
In parallel, a phenomenon is establishing itself, the so-called Women in Tech (WiT). Among other things, it is regarded as the counterpart of male high-tech entrepreneurs (Mayer 2006, p.1) and as a founder in female high-tech sectors such as the service sector (Losocco & Robinson, 1991). It is important that WiT describes a phenomenon that can be located in different contexts. Thus, no uniform definition of terms or even theory can be discerned. The particular challenge lies primarily in the concretisation of the TECH accentuation. The abbreviation can stand for technique as well as for technology. In addition, this may relate to the skills of the individuals as well as to a place/environment or a combination of both. The former refers to technical skills (Orser 2012), such as the AI skills, and to competences in the development, implementation and distribution of knowledge about the technique. When considering the location / environment factor, it becomes clear that this refers to both organisations (non-profit and for-profit) and private households. This term and the way in which it is designed are associated with the hope that women will increasingly take on tasks in technology management. This leads to the concretisation of the question raised above: What characterize WiT as responsible innovators?

We examine these questions with the help of an explorative method mix. Our samples are based on a data set of 441 individual profiles (data on educational background, occupational socialization, current job) of women and their businesses (data on sector knowledge, founding team, reputation, product/service design, business model, corporate vision). These are exclusively women who are associated with WiT. 60 % of these women were designated Wit by juries,

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ranking platforms, etc. The other 40% of women label themselves WiT. The Stilgoe et al. (2013) and Halme et al. (2013) framework will be used for the analysis. The focus is on the elements of imagination: anticipation, reflexivity and inclusion. This analysis and interpretation will be completed in December 2019 and presented at the conference in March 2020. It is expected that it will be possible to identify a specific type of WiT that is based on the establishment of a sustainable culture or work for equal access. These WiT are working with future technologies to remove structural barriers in the sectors: health, inclusion, education. The starting point for a social sustainable society (Missimer et al. 2017).

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Keywords: Women in Tech, Women in Technology, Responsible Innovation, Imagination

Conceptualizing Imagination as an Inherent Element of the Innovation Process

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Since Schumpeter (1911) innovation research has focused on various forms of innovation, such as new products, technologies, services (e.g. Edvardsson/Olsson 1996, Edvardsson 1997), business models (e.g. Chesbrough 2010; Osterwalder/Pigneur 2010), and forms of organization (e.g. Cummings/O'Connell 1978), investigating, conceptualizing and measuring their intensity or radicalness (e.g. Dahlin/Behrens 2005, Hüsig 2014), how they diffuse (Rogers 2003), and grow, shape or disrupt markets (Christensen 1997, Christensen/Raynor 2003). The genesis of innovation has been and is investigated and conceptualized as an innovation process. The concepts of innovation processes have evolved from serial processes within an organization to ones that contain parallel elements, loops and iterations, stages and gates, and that are embedded in a networked ecosystem on local and global level (Cooper 2014, Nobelius 2004, Hüsig 2014, Nelson 1992, North 1994, Edquist 2005, Lundvall 2010, Hekkert et al. 2007, Chesbrough 2003). In the scholarly discourse, the debate of the surrounding world of an innovation seems to have shifted from an emphasizes on threats stemming from the competition, the volatile customer, and the legal authorities, to a focus on the opportunities that a context, environment or ecosystem offers – from not-invented-here to open Innovation. This encompasses e.g. working with and utilizing information and innovation, organizations as well as individuals from the outside of the organization and alternative use for unused or unfinished intellectual property there (Chesbrough 2003, Gassmann 2006, von Hippel 2016).
Imaginations are understood as multimodal mental images of fictional things, such as artifacts, scenarios, and events, rather complex and persistent individual as well as socially shared ideas. This article focuses on imaginations of fictional technologies, or utopic technologies, as Michaud (2017) termed them and how these imaginations historically sediment in media creating a path from imagination to innovation. The consideration and utilization of imaginations grounded in science fiction are already taking place: There are dedicated consulting ventures such as SciFutures" or the think tank Sigma". Qualcomm undertook an open competition for the development of the handheld medical scanner "Tricoder" from Star Trek and the European Space Agency held the "Clarke-Bradbury International Science Fiction Competition".

The idea of something to be realized, the imagination of a certain product, technology, service or even concept of living and social organization has often been formulated, picked-up, reiterated and discussed over time, influencing the general social imagination in general, influencing contemporary innovation processes and preparing for future innovation before the actual

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problem-solution cycle kicks in and starts the known innovation process.

Exploring the role of imagination in the innovation process, we focus on the most fitting kind of imaginations for our field of research – science fiction. This kind of imaginations are explicated as fictional, but scientifically sound realities, often also exploring and discussing the potential impact, consequences, and implications of these imaginative technologies, concepts of alternative social systems, imaginations of the further development of the human body or the relationship and interaction with the natural environment. Imaginative concepts, fictional and speculative ideas sediment (e.g. in the form of shared narratives, stories, books, videos, and videogames), get picked-up, evolve and develop with each iteration. These sediments carry, evolve and spread imaginations, creating a path engraved in history and culture that leads to their actual realization as an innovation (Bucher 2019).

Investigating cases of technological innovation, we focused on the imaginary roots and the individuals that drive the realization. We conclude, that on one hand sedimented and social imaginations influence innovators and the individuals that actually carry the innovation process such as scientists, engineers, creatives and marketers. On the other hand, sedimented imaginations are used and intentionally produced or commissioned by individuals taking up the role of what we coin an *imaginator*, in order to influence the social imagination.

In this context, our research questions are, whether and why the process of an imagination manifesting as an innovation can be reconstructed, how imagination is manifesting as innovation and what influences this process of manifestation. Finally, we have a special interest in the social and managerial implications and ramifications of the gained insights, looking for opportunities and detriments.

We illustrate our findings presenting two well documented high profile cases of individuals that take upon both of these roles; the historic one of Wernher von Braun and the contemporary one of Elon Musk and their respective technological innovation projects regarding rocket development, space travel and new forms of transportation. Thereby we broadly follow a case study research strategy (Dubois/Gadde 2002, Yin 2013, Eisenhardt 1989), with the intend to explore the process and understand how imaginations evolve and get realized as innovations, identifying core aspects influencing their evolution and transition to an innovation.

We aim to add to this field of research conceptualizing imagination as an inherent element of the innovation process, by identifying several key aspects of the transition from imagination to innovation, putting forward the proposition, that imaginations are an integral part of the innovation process. Finally, we theorize based on our cases how and why imaginations drive innovation and propose how firms and entrepreneurs could adopt these ideas and use imaginations actively in order to get inspired or to promote their visions to gain legitimacy among customers, investors, and society.

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Keywords: Imagination, Imaginator, Innovation, Creativity, Science Fiction, Technological Innovation, Space Travel

Integration of multiple artistic languages with a modified traditional myth meaning to convey a proactive message for materials reuse and recycling

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Reuse and recycling of materials constitute one of the bases of circular economy. In the case of municipal solid waste, the message is generally conveyed through information campaigns, that focus on correct choice related to materials separation. However, this option doesn't promote a mind shift, which should consider to promote a vision of waste as wasted material. The meaning of classic Greek-Roman myth of Persephone, traditionally representing the four seasons of the year, is transformed here to represent the effects of landfilling, paralleled by Autumn and Winter seasons of the myth, with respect to recycling or reuse, as Spring and Summer of the original myth. The four parts of myth, in relation to the four seasons, are represented through four paintings, where the figure of Persephone, as well as the natural landscape, are transformed as signs of death of nature, in the case of landfilling, or as sign of rebirth and vitality of nature, in the case of recycling and reuse. The pictures are integrated with a music composition to generate a narrative sequence, as a form of digital musical fresco, to generate a multimedia product, that can be easily shared through social media. The integration of a modified element of traditional ecological wisdom (i.e.: a natural myth) and multiple artistic language can serve as a mean to trigger proactive behaviors with respect to circular economy. Finally, this method could be adapted and used in different cultural contexts to communicate and promote sustainable behaviors, as well as to encourage a positive mind shift by citizens.

Keywords: circular economy, myth, music, figurative art, art, based research, waste management, materials recycling, materials reuse

*Speaker

Probing the Relationship between Creativity and Moral Imagination: A Multi-Case Study.

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Probing the Relationship between Creativity and Moral Imagination: A Multi-Case Study.
Stéphane Gangloff, Kamel Mnisri, Klaus Peter Schulz

Research Question, Aim and Objectives:

In the era of the Anthropocene, "we" the companies, the NGOs, governments, schools, citizens have a moral obligation to adopt a creative and morally responsible behavior for the world to be sustainable. In order to answer this climax, I propose to explore the relationship between Creativity and Moral Imagination.

This paper aims at answering the calls by recent academics on the association of Creativity and Ethical Decision Making. Indeed, despite a quite prolific literature on the association of creativity and moral principles, researchers acknowledge the fact that they remain too conceptual and need empirical evidence to gain in scientific maturity (Godwin 2006 in Whitaker 2012). As a starting point we will use T. Amabile's definition of creativity as "the production of ideas or outcomes that are both novel and appropriate to some goal" (Teresa M. Amabile, 1983). As to Moral Imagination, there is a variety of definitions but they all share a common underlying meaning: "moral imagination is a requisite component of responsible moral judgement as it enables one to disengage from a situation in order to consider new possibilities and evaluate these possibilities in terms of their moral worth and potential for positive impact" (Whitaker 2012). As a review to these conceptual considerations on Moral Imagination and Creativity, we published a first paper: *The relationship between Moral Imagination and Creativity in teams: a Literature Review*, which revealed the potential drivers - "perspective taking" and "other focus"- between creativity (as in idea generation) and moral principles in a team work . If we refer to the first paper as phase one of an overall project, phase two would be the experimentation of the theoretical findings. Although it is paramount for today's society to reflect upon creativity and sustainable solutions, the scientific literature on the question deserves new frameworks since no clear consensual definition has been accepted on the concepts yet.

The research question posited: "What is the Relationship between creativity and Ethics in team work?". The research aim is to build theory by addressing objectives that seek to (a)

*Speaker

identify the leverages to creativity and moral principles put forth in the literature, (b) assess the relationship between the two concepts, (c) have other concepts emerge during the whole experimental process.

At the core of this project is constructivism, a theory of sociology according to which human development is socially situated and knowledge is constructed through the interactions with others.

The primary thrust of this paper is therefore to inspect the relationship between the creative process and the moral principles and discuss the commonalities based on a grounded theory approach. Since there are still very limited empirical studies in this field, this research intends to fill in the gap in two manners. First, by using the purposeful sampling technique by focusing on researchers dealing constantly with creative and moral issues, using a multi-case analysis. Second, by confirming / revising the findings of the conceptual paper through which "perspective taking" and "other focus" are prominent variables to leverage Moral Imagination.

First and foremost, the value of this study is that it is part of a bigger project on Creativity and Moral Imagination in which this study is the logical continuation of the first article that will promote the discussion based on the findings and potentially revisit or confirm the conceptual model of the literature review associated. As well during the interviews critical thinking on ethics and morality in researchers' teams may emerge and may help make progress in the field of science. It is as well important to empirically explore the link between creativity and morality and identify the moderating variables between the two concepts and determine if there is a reciprocity effect as envisaged in my conceptual model.

The methodology

This study applies a research methodology developed for exploring the characteristics of the interactions between team members necessary to leverage moral principles and creative ideas in team projects. Due to the complexities and subtleties of the data to explore, the research methodology is based on a qualitative methodological approach with a constant back and forth introspection on the data and the concepts to confirm or further elaborate the conceptual framework issued in the theoretical article. The study is designed to be multi-case analysis, using scientific institutions with a significant involvement on the international scale.

One of the conditions of this exploration was to have access to people who deal with creative and ethical issues on a regular basis as constraints / goals to their missions. I consequently turned towards scientists in pure science (biology, biochemistry, physics, medicine ...) because any researcher is to be creative and bring results and also because they aim at developing interdisciplinary research in their own field and are recognized by their peers.

The research design and methodology provided a framework in getting from the original research question - "What is the relationship between Creativity and Ethics in Moral Imagination in projects' teams?"- to the conclusions answering it or for new concepts to emerge. The approach is exploratory in as Yin (2009) wrote "... case studies are the preferred method when (a) 'how' and 'why' questions are being posed, 'b' the investigator has little control over the events, and 'c' the focus is on a contemporary phenomenon with a real-life context" (p2).

The multi-case study consists in researching five team members (researchers) of four of the most significant European research centers involved in a variety of research domains (biomedicine, application-oriented research organizations, aeronautics and medical environments, healthcare). Keeping in mind the complexity of data collection in this field and the overall objective to collect sufficient and reliable data, I have determined to reach 5 interviews with 4 institutes.

Although the ideal number of interviews does not exist, "between four and ten cases usually works well" (Eisenhardt, 1989, p.545). A stress on diversity (gender, age, cultural background, experience, power distance: team leader / team member) will be put during data selection. The team members of the four scientific centers selected area of a purposeful sample (M.Q. Patton, 2002) in that they have the contractual obligation to publish and bring new results and comply to the general rules of ethics, thus, anticipating the potential question of whether they are or not creative and ethical. Semi-structures interviews will be conducted with each of the team members. The constant observance of correlation of data inside the different pools of data and between pools will be analyzed in the light of the literature to build theory (Eisenhardt, 1989; Eisenhardt and Graebner, 2007).

Thus, this multi-case study is designed to ensure the overall reliability of the research (Yin 2009). This project will include a tangible database (transcripted interviews which will be encoded using NVIVO 11 software), and correlate the findings to the research question (Yin 2009).

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Keywords: Creativity, Moral Imagination, Team, Multi, Case Study

Drink the Jungle: Business shamans and their unconventional coaching methods

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How to foster imagination and creativity in order to be more productive and innovative? This question has been of concern to the consulting and coaching industry for a long time. Within the classic coaching industry there is a multitude of providers and competitors. In order to survive in a highly competitive market, appropriate competitive strategies are needed. A desirable, effective and popular strategy is to stand out from the competition through differentiation and thus increase its uniqueness. Porter sees a possible competitive orientation in differentiating itself from its competitors. In this strategy, products and services are characterized by a clear unique selling proposition (USP) that differs significantly from existing offerings on the market [Porter 2004]. A differentiation strategy may exclude a large market share, but if managers and innovators focus on a niche segment within the industry, the risk loses substance. Therefore, it can even be advantageous to focus on certain customer groups or segments and utilize a disruptive strategy [Christensen et al. 2002]. According to Porter [2004] this also leads to a better understanding and thus a better fulfilment of customer needs.
One option to differentiate yourself within the coaching industry is the use of unconventional coaching methods. Examples range from healing ceremonies to spiritual mentoring to explicitly supervised consumption of psychedelic drugs such as ayahuasca [Costuros 2016; Chiu 2018; Wyss 2019].

Historically, according to Sessa [2012] there have been roughly three major phases of psychedelic culture: The first psychedelic era was from 1880 to 1930 and it is connected with Mitchell's [1896] and Ellis' [1897] research on mescaline. Both were enthusiastic advocates of mescaline experiences, and their research inspired many others to explore the sensory and spiritual aspects of the mescaline cacti [Sessa 2012]. The second era from 1938 to 1976 was heavily influenced by Albert Hofmann and his experiments with as well as synthesization of psycho-active substances, in particular LSD. Also, well known from this second era are works of Aldous Huxley and Timothy Leary, two of the most famous psychonauts, which can be traced back to their own psychedelic experiences [Sessa 2012]. *Psychonautics* is "the means to study and explore consciousness (including the unconscious) and altered states of consciousness; it rests on the realization that to study consciousness is to transform it" [Cohen 2010]. Using psychedelic substances to stimulate imagination and creativity is not a new approach, but it seems to have extended from the spheres of art and research to the economic world. Nowadays, the third psychedelic era is still continuing. Due to an increase in psychedelic interest within the mainstream in recent years, a kind of

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psychedelic renaissance is taking place [Sessa 2012]. The supervised consumption of ayahuasca as a coaching method will be briefly illustrated in the following case of EntrepreneursAwakening.

The use of hallucinogenic drugs within the tech industry is nothing unusual - Steve Jobbs and Bill Gates already experimented with LSD [Robinson 2016], *microdosing* is a growing Silicon Valley trend [Mosbergen 2018]. In recent years the demand for ayahuasca experiences has increased, probably due to reports in various media outlets [Robinson 2016; Colin 2016; Fast Company 2017; McClelland 2017; Spicer 2019; Roth 2019]. Ayahuasca is the name for a psychedelic plant brew, that is commonly used in South and Mesoamerica in religious ceremonies [Naranjo 1967; Naranjo 1979; McKenna et al. 1984]. Nowadays Ayahuasca is no longer only used in a religious context, it has made its way into the business world. More and more start-ups send their employees on ayahuascatrips and hope to optimize their work force [Roth 2019]. In Silicon Valley, this practice seems to be particularly in vogue. One outgrowth of this trend is EntrepreneursAwakening, a professional retreat program founded in 2012 and based in San Francisco. As ayahuasca is legal in Peru, EntrepreneursAwakening organizes traditional ayahuasca tea ceremonies every year for a small group of international entrepreneurs. Around 50 people from several tech startups have passed through EntrepreneursAwakening' Ayahuasca Program so far [Robinson 2016]. Michael Costuros, founder of EntrepreneursAwakening, "uses the jungle vine to help clients come to terms with their weaknesses and find shortcuts to success in the ultracompetitive tech scene" [Robinson 2016]. Nowadays, Costuros – a former tech entrepreneur – receives hundreds of applications every year to join his trips in Peru. According to his own information, most of them come from the tech industry [Robinson 2016].

As this brief case description shows, there is an emerging market in the area of psychedelic coaching or business shaman coaching that utilizes drugs and indigenous rituals to foster imagination and creativity. Aiming to explore this new strand of coaching our research is driven by the following research questions: *What do these business shamans actually offer? What is the design and procedure of such psychedelic coaching processes? What is the USP of business shaman coaching? Which sectors of the economy embrace this kind of coaching?*

In order to answer these questions adequately and investigate this rarely studied contemporary phenomenon, an explorative research methodology is used [Shields & Rangarajan 2013]. To study this new trend in coaching in detail a qualitative research approach was chosen. In order to enhance the credibility and quality of the qualitative investigation as well as the findings, a triangulation strategy is applied, covering the data, methods, and interpreters [Patton 1999; Flick 2008]. First, qualitative expert interviews [Gläser & Laudel 2010] are conducted, transcribed [Bailey 2008; Davidson 2009], and analyzed using qualitative content analysis [Mayring 2014]. Several business shamans have already been asked for an interview, two of them have already confirmed their participation. Second, there will be a document analysis of several kinds of secondary data including but not limited to, articles, interviews, and websites [Bowen 2009; O'Leary 2014].

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Keywords: coaching, business shamans, ayahuasca, entrepreneurs, imagination, creativity

Is Technology Foresight Science Fiction?

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Abstract:
In a world of ever growing complexity, with its ultimate dependency on technology becoming one of the major risks for mature societies, technological foresight is the method of choice supporting strategically thinking decision makers.

By extending the temporal horizons to one or more decades in advance and taking into account the accelerating development cycles of modern technologies, foresighting has grown to be a tough job with an inherent danger to overstretch people's imagination. Thus, results of foresight processes are sometimes labelled "science fiction", giving the term a negative connotation.

However, this label might not be wrong at all. And, additionally, it ought not to be considered negative in general.

In this lecture, the foresight process will be studied with respect to its scientific as well as to its fictional parts. It will be shown that technology foresight is a scientific process from a holistic point of view. It is based upon approved methods with repeatable results which is mandatory for any scientific discipline. Nevertheless, it also contains fictional parts in the narratives used to communicate the results and to force decision makers to think of their strategic options.

Keywords: Foresight, Technology, Decision Making, Science Fiction

*Speaker

...and then Blockchain solved all of our Problems. How Sci-Fi and Cyberpunk Narratives are used to frame the Discourse of Blockchain Development.

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"After all, the future looks like a promise retrieved from Sci-Fi dystopias. Global crisis, ecological breakdown, oil resources turning scarce, technology available to almost everyone, more efficient software and hardware, are the new background to all of us." (Elias, 2009: 12)
"[...] But for all the good we've achieved, the web has evolved into an engine of inequity and division; swayed by powerful forces who use it for their own agendas. Today, I believe we've reached a critical tipping point, and that powerful change for the better is possible - and necessary." (Berners-Lee, 2018)

The Problem: The role of socio-cultural narratives in the innovation and diffusion process of new technologies is being largely neglected by innovation research.

Looking at the current hype of blockchain technologies and drawing on previous research on technologies such as the Hyperloop and bio-Mems we argue that the interdisciplinary field of innovation research is ignoring one major element that is influencing innovation processes and the emergence of innovations in general: socio-cultural narratives and imaginations (Verworn & Herstatt, 2000). Building on media artifacts such as science-fiction literature (Lem, 1983; Sterling, 1986), movies and tv-series (Hanna & Barbera, 1962; Ôtomo, 1988; Scott, 1982) as well as websites and project whitepapers, we show how (sub-)cultural imaginations – sedimented, discussed and reified in multimodal media – create paths from imagination to innovation by becoming widely shared narratives of social imaginations that finally become actual applications, agents of social change and innovation.

*Speaker

Its Significanc: Fictional narratives inspire and inform innovations and their diffusion. Focusing on the how and why, we contribute to the understanding and conceptualization of these processes.

Science Fiction seems to have a direct influence on some inventors, who, like Werner von Braun, the Nazi rocket scientist who worked for NASA after the second world war, were writers themselves and, who used science fiction to popularize their visions while drawing inspiration from fictional reflections on technologies impacts on society (Bucher, 2019; Bucher & Hüsig, 2019).

In a talk given by Vinay Gupta, co-founder of Consensys, an important blockchain technology company, he states, that we can understand blockchain technologies and the programmers and engineers working on blockchain applications, only if we understand cyberpunk (*Vinay Gupta at Michel Bauwens & the Promise of the Blockchain*, 2016).

When looking at the relationship of fiction and reality in the field of blockchain technologies, the question is if science fiction and cyberpunk narratives influence developers' interpretation of the perceived (social and economic) state of the world and the roles technologies play, played and could play in that respect. Can this influence be identified within their narratives?

Introduced in the wake of the international banking crisis in 2009, the founding narrative of blockchain technologies and their community is one of the failures of the banking system and the failed promises of the freedom and equality of information and knowledge of the early internet (Berners-Lee, 2018). Blockchain technologies are supposed to rectify the lost trust, to mitigate the risks within the system and enable the exchange of assets and information among equal peers. They deny the need for intermediaries that resemble the corporate behemoths imagined in the cyberpunk genre in the 1980s. Self-conscious, some of its proponents use narratives and multi-modal science-fiction to imagine and prescribe a better future, in which technologies like the hyperloop, bio-MEMS, and blockchains play central roles in society (Cellarius, 2018).

Cyberpunk extrapolates social and economic developments of its time into a not so distant future and continues to be of importance today. The narratives and tropes of cyberpunk can help us understand and reflect on these developments from a fictional starting point. In this view, people developing and promoting blockchain technologies are influenced by cyberpunk and the social developments for which it serves as a lens. It captures the concerns and hopes for the role the internet and blockchain technologies play in the world of today, which resembles some of cyberpunks darkest visions of the future and it also serves as a reference for the role internet technologies should play in the future.

We think that cyberpunk kept its influence, leading to its revival today, because it highlighted and extrapolated the deep social shifts of the 1980s, which were also at the centre of the observations formulated in the theory of reflexive modernity (Beck, 1992; Beck et al., 1994; Sørensen & Christiansen, 2012). The theory of reflexive modernity describes deep changes in the structure of key areas of society and some blockchain-based applications can be seen as ways to reflexively work at these shifts, mitigating their negative impacts.

What we did: By conducting a series of single-case studies with one revelatory case, we trace the role of cyberpunk narratives in different blockchain projects and relate those to the theory of reflexive and digital modernity.

In this study we seek to find the "semantic ghosts" (Gibson 1986) of past imaginaries in the self-descriptions and public communications of startups and organizations developing different applications of blockchain technologies and interpret them in light of the theory of reflexive

modernity.

This study uses a multiple single-case study design with a holistic revelatory (Yin, 2003: 42) and multiple representative cases (Yin, 2003: 40–41) embedded in the same general context (social developments of reflexive and digital modernity and their fictional precursors in cyberpunk). We see the case of the Cellarius network (Anderson, 2018; Cellarius, 2018) as a holistic revelatory case because the project explicitly states and emphasizes the influence and impression cyberpunk has on some of the innovators and projects.

The other cases – "data as a commodity": e.g. lumeos.io; "corporate behemoths": e.g. inrupt.com/solid; "center and periphery": e.g. alice.si – serve as typical embedded single cases, which demonstrate how blockchain start-ups reflect and attempt to solve social and political developments they deem detrimental to their imaginary of contemporary society and economy. Each case examines at least two projects or organizations that attempt to solve real world problems that resemble the dystopian visions depicted in cyberpunk.

To convey their normative point about a desirable or undesirable future, narratives focus only on relevant events that are causally linked not by logic or probability, but by a coherent plot structuring the narrative (see Polletta, Chen, Gardner, & Motes, 2011: 111). So, for each case, we identify the central narrative, which can be seen as implicit order that is supposed to guide the interpretations and possible ways one can behave and react to the offered solutions (Polletta et al., 2011: 112), and trace it to its cyberpunk precursors.

What we found: Preliminary findings indicate a range of different uses of cyberpunk narratives in blockchain projects, from the deliberate use of narratives that are explicitly cyberpunk to narratives, that match the ones found in cyberpunk, without direct links to their probable origins.

While the research of this project is still ongoing, our preliminary findings show, that the narratives, used by blockchain projects position the (potential) user in the role, the protagonists of cyberpunk media usually inhabit. They present narratives, in which the user is the victim of detrimental social developments and, that he or she is able to take part in overcoming them for their own and the benefit of society, by adopting the different solutions, the projects are offering. These results also underlines the validity of the assumption, that blockchain technologies are attempts at changing the trajectories of different areas of society, examined by the theories of reflexive modernity.

What we recommend: We highlight possible opportunities to utilize fictional narratives to reflect on and influence the development trajectories of innovations for sustainable management.

At this point in the research, we identify three insights, that will be of use to practitioners:

- The study exemplifies how fiction can be used to scout potential innovations and aid in their diffusion.
- Showing how social developments are being picked up by fictional media and how they are being extrapolated can help to identify desirable and undesirable futures whose depictions can in turn be used to inform and inspire the development of technologies in favor or opposition to the imagined outcomes.

- The study also shows, how fiction and narratives can work in combination to foster responsible innovation, by reflexively extrapolating different possible trajectories of the societal impacts of innovations.

The study also shows how important it is, to keep a critical eye on the narratives corporations use to promote new technologies and to underline their potentially empowering capabilities. While being informed and inspired by cyberpunk, the possible trajectories of blockchain technologies remain to be fully explored. The cases examined in this study are hopeful and show an interest in responsible innovation, empowering users against social dynamics, that are perceived as detrimental to society. However, blockchain technologies could also prove to become technologies of control, and maybe science-fiction can help us this possible direction as well.

Keywords: blockchain, cyberpunk, innovation, narrative, case study

How can makerspace contribute to training for complex technological innovation? – the case of aviation-based training for surgery robotics.

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How can makerspace contribute to training for complex technological innovation? – the case of aviation-based training for surgery robotics.
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Key words: Robotic surgery, makerspace, training, innovation, communication, aviation

Introduction

Simulator training holds an important role in current robotic training curriculum of future robotically trained surgeons (Smith et al., 2014). The last 20 years has seen an exponential increase of clinical adoption of robotic surgery to assist surgeons in operating theatres. As palpation, that is, touching the body of the patient, are essential in open surgery, in robot-assisted operations surgeons need to see or induce visual indicators to guide their operation, because there is no tactile (haptic) feedback from the robotic device (Seppänen et al., 2017). Robotic surgical devices allow a surgeon to achieve two goals: the telepresence, the performance of repetitive and accurate tasks. This revolution in surgical technique demands the rapid acquisition of basic skills by surgical trainees (Alvin et al., 2012). Moreover, several papers have addressed a need for standardization for training and credentialing in robotic surgery as has been done with Fundamentals of Laparoscopy Surgery for laparoscopy in general surgery (Buchs et al., 2013; Hung et al., 2014).

Effective transfer of skills from simulators to the real settings requires a structured and effective simulation-based curriculum. Kneebone et al. (2003) call for a closer alignment between simulation, clinical practice and rehearsal of clinical learning skills in the simulated environment before applying them in real clinical practice. Collaborative practices (Leonardi, 2011), and technologies all demand new ways of acting skilfully, cultivate new skills in communities of practice to stay relevant during a new and shifting set of problems (Susskind and Susskind, 2016). Developing new forms of work-based learning for the age of digitalization (Wahlström et al., 2014) is to be coherent, by using a new form of learning that are needed in complex high technology work.

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Makerspace is relatively new approach that offers learning and teaching in a space where communities engage in both peer learning opportunities experienced through interaction, cooperation among users, which generates a creative learning platform and communication tools to support innovation (Sheridan et al., 2014).There are several examples of successful projects in the literature that used simulated scenarios at the actual clinical setting (Lindberg et al., 2018) or in a simulated clinical environment to explore the functionality of multidisciplinary teams (Paige et al.,2011).

A study of non-technical skills showed correlation between the number of technical errors which occurred (Carthey et al., 2003). Communication and safety have been mainly focused on the development of methodology (Healey et al., 2006). Reviews of practice in high-reliability industry such as aviation emphasise the need for training in principles of teamwork and communication to reduce the risks of error (Flin et al., 2002).

The aim of this study is to understand everyday practices at the Stan Institute makerspace training centre that offers the training program designed to increase knowledge, safety, situation awareness, error management, communication and develop a deeper understanding of usages and interactions of complex high technology work in a simulated robotic surgery environment. To this end, the guiding research question is how well makerspace influence learning activities of simulation-based training and encouraged collaboration?

Theory

Maker movement is an emerging worldwide technological phenomenon that is bolstered by developments in ICT and the proliferation of collaborative web communities, as well as Makerspaces where communities engage in both peer learning opportunities experienced through interaction and cooperation among users, which generates a creative learning platform (Sheridan et al., 2014).

The role of spaces has been studied by organizational scholars to understand how workplace design can promote learning, improve performance, support collaboration, and boost innovation (Allen, 1977; Fayard and Weeks, 2011). There is also an understanding that design of the space does not end with the space created, but with how users interpret and use the space (Fayard and Weeks, 2011). For instance, when activities are distributed across space such in surgery the language used by task performers is almost certainly going to serve to organize resources to fit with environmental constraints (Nyseen and Blavier, 2008).

Simulation and makerspace approach offer the opportunity to explore the dynamics of these communities of practice, find solutions to improve communication and cooperation between healthcare professionals.

Methodology

In order to understand everyday practices in the space and develop a deeper understanding of usages and interactions, a qualitative approach (Glaser and Strauss, 1967) was embraced. Semi-structured interviews conducted with trainers and trainees at the Stan Institute training centre for the robotic surgery. The analysis supported by the observations in the Makerspace. During the workshop, we did short in situ interviews (on average 10 minutes) with the trainees and instructors in the space in order to elicit some interpretations and clarify questions that arose before.

Results

Kneebone and Baillie (2008), argue that simply becoming an expert on a technical skill by isolated practice on a simulator might lead to misleading confidence, because it does not prepare trainees for the unpredictability of real clinical practice. Therefore, it will be more beneficial if trainees develop a certain level of competence through practice on simulators and then experience practising these skills in a contextualized OR environment.

One of the most interesting insights emerging from this Makerspace linked to the OR design is lacking and little guidance exists on how OR design can improve safety and performance outcomes of a shared method in the literature (Joseph et al., 2017).

Participants in this study believed that simulation-based training, as seen in the aviation industry, should exist for robot-assisted surgery skills acquisition. Consequently, as with other technological translations into clinical practice, learning curve may have multiple training phases for surgeons before becoming proficient in the technique.

Conclusion and Implications

The makerspace setting in robotic-assisted surgery simulation environment can help healthcare professionals to understand of the work systems that includes the organization, people in the space, required tasks, technology and the built environment such as analogous to the R&D subsidies provided to producers by government (Svennson and Hartmann 2016).

Abstract rehearsal as in aviation may become an increasingly accepted mode of acquiring basic competence, teamwork and communication to reduce the risks of error with novel technology-dependent methods, expanding and enriching the talent pool.

Our study was mainly limited by its small sample size of participants. Future work will build on this research to assess what resources, training, and mindsets are needed to grow a community that previous research has shown to be central to the success of makerspaces.

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Keywords: Robotic surgery, makerspace, training, innovation, communication, safety, aviation

Towards to third Generation of Universities with an Entrepreneurial Approach

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Abstract

Design: Universities must face new challenges in order to be able to satisfy the entrepreneurial expectations. Generally, the third generation of universities is entrepreneurial and interacting with environment based on organizational and scientific attitude within the social problem solving and entrepreneurship. These universities are looking for a common way to provide entrepreneurial opportunities for society and showing up innovations in different ways.

Analysis Methods: In this research analytic and descriptive method was used for better conceptual cognition of third generation of universities and entrepreneurial universities, so documentary research was used as a record track.

Conclusion: The growth of social communications shows the different part of social life such as higher education system as a distinguished and paralleled phenomenon. Based on the importance of entrepreneurial universities role in social and economic development of society, activities are centralized and required the presence of student. So in this research the entrepreneurial universities are analyzed too.

Keywords: Key word: organizational structure, innovation, entrepreneurship culture.

*Speaker

Between art and innovative technology – An art presentation related to the technology acceptance of indoor tracking

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We live in an age of disruptions where we must deal with many different challenges all over the world. Besides the global and far-reaching problems, such as the massive environmental issues, there are also less noticeable social problems that affect our fellow human beings. One of those topics is the physical health of the society in general. This includes health-enhancing activities for children, healthcare for employees at their workplace and the well-being of the elderly. For this subject area the indoor tracking technology holds a high potential to tackle these issues. The creation of innovative technologies which can be applicated in the everyday life can lead to a sustainable development within this humanistic matter. Therefore it is important to give further investigations to this topic, in order to highlight creative application possibilities for the indoor tracking technology (Hsu und Chen, 2011, p.1; Choi et al., 2017, p.1; Varshney, 2005, p.69 f).

In our project we want to find out more about the technology acceptance of indoor tracking, to give an outlook in which extend such a technology could be implemented in different fields. One aspect of our investigation is therefore to test the technology acceptance of indoor tracking in practice. Therefore, the participants of the ARTEM OCC conference should become an active part of our project. In the process of planning the use of a tracking technology at the conference, an essential aspect is the consent of the visitors to actually use this technology. Because of this fact, the following considerations result: Which factors are decisive for the visitors, so that they use an innovative technology? When accepting a tracking technology, are there special aspects to consider? Is there cultural specificity among visitors from different countries regarding technology usage? In order to investigate people's acceptance of an innovative technology, the "Technology Acceptance Model", by Fred Davis from 1989, is the most widespread research model in Anglo-American space which we also want to lay upon our research (Königstorfer and Gröppel-Klein, 2008, p.24). Regarding to the ARTEM OCC we would like to link our research to an artwork, which is supposed to be presented at the conference. The concept of acceptance is a far-reaching and complex term that is not subject to any uniform definition in research. However, according to Schwarz and Chin, the term implies a constant use of technology over a longer period (Schwarz and Chin, 2007, p.232 f). In the case of the ARTEM OCC the use of tracking technology is meant for a relatively short period of time. Therefore, the investigation of the ultimate acceptance by the TAM is only secondary. However, the model can provide important clues, such as which aspects could have a significant impact on the eventual use of a

*Speaker

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technology. The model contains two core elements, which are examined for an interaction with the use of a technology. The first one is the "perceived ease of use", which Davis defines as the amount of effort a person feels to bring out to use a technology (Davis, 1989, p.320). The second is the "perceived usefulness", which states how much one's own work performance improves by using a technology (Davis 1989 p.320). The TAM has been adapted many times with the constant development of innovative technologies in a variety of research questions (Marangunić and Granić, 2015, p.81). In the context of workplace indoor tracking for instance, Choi, Hwang, and Lee examined what other factors might influence the intention to use such a technology based on the TAM (Choi et al., 2017, p.1). Two studies, each with a portable technology, were conducted to find out that the perceived privacy risk and social influence and hedonic motivation constructs can also have a significant impact on the intended use of such a technology (Choi et al., 2017, p.33 f). "Perceived Privacy Risk" describes the privacy concerns that could be compromised by tracking technology. "Social influence" describes to what extent a person perceives that other people will consider it important that this technology is used by the respective person. "Hedonic motivation" describes the sheer fun factor that a person experiences when using the technology (Choi et al., 2017, p.33). Based on the available results, these aspects should therefore be addressed to successfully attract users to the ARTEM OCC who should ultimately use the indoor tracking technology. Within the field of indoor tracking there are several technologies to choose from. Different methods in question for the ARTEM 2020 included: Tracking with sensors radars, cameras, RFID or Bluetooth beacons. Tracking with sensors or cameras are opportunities of indoor tracking, which are exceedingly accurate, as the cameras is able to identify a person and track its free movement, such as the sensor radar systems (Bartoletti et al., 2014, p.157 ff; Botía et al., 2013, p.83 ff). RFID or Bluetooth Technology gives the opportunity to track people with wearable devices or smartphones whenever an individual physically passes a responder (Geng et al. 2014, p.96 ff; Lin et al., 2015, p.4970 ff).This gives the opportunity to install a few devices in the needed areas, which limits the movement tracking to certain locations or paths. To determine the right application for the purposes of this study we created a set of criteria. Most importantly is the technology acceptance so that the project can be carried out at all. The other main goal is the association with one of the core topics of the ARTEM: connecting science and art. For this reason, one of the targeted outcomes of the movement tracking conduction is a piece of art which shall be presented at the conference. Another criterion is the costs that have to be covered for the technology. Also, there are other criteria such as the feasibility of installation, use of hardware and software and possible sponsoring by a company. From these points of view, we first decided on Bluetooth Low Energy Beacons, which is even cheaper compared to RFID technology. This tracking option can be installed with minimal effort and is supported by many operating systems and devices. In addition, the software is relatively easy to use. Furthermore, the technology is very reliable and accurate to within one meter. Because we want to cover every possible angle at the venue of the conference, we need a certain amount of flexibility from the technology. This is given by the freely selectable attachment of the Bluetooth Beacons. In this way the people should get the experience that they participate on the creation of the artwork and that they can influence the progress through their movements.

By focusing on a more sustainable developments in our society, this should lead us to a conclusion, what includes concrete recommendations in which way indoor tracking technology can be used in social application areas. Besides our own findings several contributions could be provided for the ARTEM OCC. Visitors can find out more about their own behavior at the conference or public situations in general, that may be affected by perceived monitoring. Also, an additional awareness of tracking technologies and a new perspective about several issues relating to this topic can be provided within the conference setting. And ultimately we create the idea, for the participants in our study, of being an active part of the whole event which is reflected in our final artwork.

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Keywords: indoor Tracking, technology acceptance model, innovation, social impact, artwork

Old answers to new questions. Why and how companies can use ancient disaster narratives to learn for the future

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Before the backdrop of the 4th Industrial Revolution, economic, political and social spheres are changing. Buzzwords like disruptive innovation, digital transformation and vuca world (volatile, uncertain, complex, ambiguous) have evolved into commonplaces in academic literature, management trainings and daily press.
Simultaneous to these global economic, political and social developments, global climate is changing. The effects of climatic change include desertification, soil degradation, and shortage of drinking water[1] that all bear potential for social unrest, mass migrations and wars. Already now, it is also visible that climate change triggers an increase in the numbers of extreme natural events worldwide.[2] This trend is likely to continue in the next decades and will cause ever greater social and economic losses. These slow (i.e. those caused by events like desertification) and rapid (i.e. those caused by extreme natural events) social 'disasters' will impact the globalized political and social system and thus exacerbate the globally noticeable effects of both types of natural 'disasters'. Faced with the challenges of climatic change, the vuca world acquires another dimension: it becomes disastrous.

Disastrous situations are characterized by their se un-ness: They are unpleasant, unexpected, unprecedented in their implications and, most importantly, unmanageable.[3] This nature makes it hard for any society or organization to prepare for disaster. While slow disasters allow for relocations or other measures, the most common strategies to mitigate the effects of rapid disasters are simulations of extreme events and the raising of people's awareness to the likelihood of extreme natural events by keeping the memory of similar past events alive.

The latter method is not modern but can already be observed in the earliest text. Early Greek authors Homer and Hesiod just like the Chinese Bamboo Annals or the Persian Gilgamesh Epos all discuss extreme natural events and their effects. One of the most notable of these early disaster narratives is that of the Greek polis Helike that was destroyed by a sequence of earthquake and tsunami and served as an inspiration for Aristotle' popular story of Atlantis.

While Atlantis is still a common motif in movies and literature, the original ancient story of Helike's destruction yields many important insights into the social construction of disasters that continue to be relevant to this day. After a short introduction into the theory of disasters, the presentation will outline insights and apply them to economic world of the Fourth Industrial Revolution.

*Speaker

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Keywords: past, narratives, future, vuca world, climate change

3. Future Cities: Alternative Governance and Innovative Technologies for Sustainable and Smart Cities

Consumer understanding of green symbols on beverage packaging and its influences on green behavioural intentions

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1

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Consumer understanding of green symbols on beverage packaging and its influences on green behavioural intentions

Abstract

Climate change dilemmas and other natural disaster issues have been a leading topic in the media, making conserving the environment one of the most relevant and highly valued topics (Finisterra do Paço & Raposo, 2010, p. 287). The society engages in socioeconomic activities daily, which have a negative impact on the environment (Bhatia & Jain, 2013, p. 1). The consequences of climate change include a rise in life-threatening weather conditions, including floods, droughts and heat waves (Tobler, 2011, p. 15). Zhang and Zhao (2012, p. 901) argue that one of the sources of the environmental crisis is packaging in that there is lot of solid waste, liquid and gaseous pollution produced when packaging is produced.

Businesses from different sectors take initiatives to combat the issue of climate change through green marketing (Finisterra do Paço & Raposo, 2010, p. 287). Green marketing, explained by Lee (2008, p. 514) is the marketing of products with less harm to the environment by marketers in an attempt to save the environment. Green marketing is accomplished through green processes, green packaging and eco-labelling through green symbols (Lihhavtshuk, 2015, p. 35).

Lihhavtshuk (2015, p. 35) identifies several green marketing activities that many companies in the beverage industry engage in, which are, making changes to the production process, green packaging, and green labelling through green symbols. It is all very well for marketers to go 'green' and implement these initiatives but for sustainability to be achieved consumers need to behave in a green manner. They need to buy the products with green packaging and need to respond positively to the green eco-labels (Horne, 2009, p. 179; Pedersen & Neergaard, 2006, p. 17). For consumers to respond positively not only requires that they care about the environment but that they understand the green symbols on packaging and that they use them to make product choices (Rokka & Uusitalo, 2008, p. 517).

*Speaker

The rapid increase of environmental concerns has led to many studies on environmentally sustainable consumption being carried out in different countries on different product groupings such as electricity, textiles, apparel, food and other grocery products (Kang, Liu, & Kim, 2013, p. 442). Anvar and Venter (2014, p. 183) and Scott and Vigar-Ellis (2014) conducted research in the South African context with regards to green products but no studies have been done to determine the level of understanding of green symbols and the effect this has on green consumption. Little is known about this in the South African context, specifically in relation to non-alcoholic beverage packaging. Although green symbols are displayed to pass on the message to consumers (Kong, Harun, Sulong, & Lily, 2014, p. 197), more information is needed to determine if the existence of green symbols has any influence on how people behave.

The purpose of this research was to evaluate consumer understanding of green symbols on beverage packaging and the implications for green behavioural intentions. The objectives of the research were to determine consumers': Green behavioural Intentions with regards to beverages with green symbols; their knowledge of, attitude toward and confidence in green symbols and the impact of these factors on green behavioural intentions; and the effect of demographic factors on knowledge, attitudes and behaviour relating to green symbols on beverage packaging.

The conceptual framework of this study was developed mainly using the two conceptual frameworks from Liobikienė, Mandravickaitė, and Bernatonienė (2016) and Zhao, Gao, Wu, Wang, and Zhu (2014). Different constructs from the two models were combined to come up with a single model for this study.

The study focused on hand held water and energy drinks as consumers usually carry these with them for their convenience and consumption of these products is high (Ronquest-Ross, Vink, & Sigge, 2015, p. 10). The research design was descriptive as it aimed to evaluate consumer understanding of green symbols on packaging of beverages and the impact this has on green behaviours. This approach allowed the researcher to find how different attributes contribute to the overall green consumer behaviour, since little is known about consumers' attitudes, knowledge and behaviour relating to green symbols specifically in the South African context. This study adopted a quantitative approach which was needed to effectively measure relationships between variables (Saunders, Lewis, & Thornhill, 2009, p. 414). Participants in the study were drawn from a population of adults who are active Facebook users through the use of the snowball sampling technique, which is a non-probability sampling method (Baltar & Brunet, 2012, p. 59). Data was collected using an online questionnaire sent on Facebook and 307 competed questionnaires were analysed. Before the actual survey was conducted, the questions were tested through a process of pilot- testing.

This study found soft drinks to be the most consumed non-alcoholic beverage consumed several times a week, followed by water, fruit juice and then energy drinks. Most consumers agree that they buy products that can be re-used and recycled but are neutral about buying products with green symbols, which means they are not sure if the products they buy have symbols or not because they don't pay attention to the symbols.

In terms of knowledge of green symbols, and their impact on green behavioural intentions, none of the respondents knew all nine symbols, regardless of their demographics. Respondents were found to have little knowledge of the green symbols regardless of their race, age group, employment status and educational level.

Consumers showed a positive attitude towards green symbol. They agree that it is better to buy products with green symbols than those with no symbols and that they are a good way to alert consumers of their pollution to the environment. However, they are neutral when it comes to

making an actual purchase and are unsure if they need to be persuaded to buy green symbols. Consumers lack confidence that claims by marketers that their products are less damaging to the environment are true and that green symbols are a true representation of its environmental performance.

Looking at the education factor, educational levels were found to have no effect on knowledge, intention to purchase and attitudes towards green symbols. These results differ from those by Chekima, Wafa, Igau, Chekima, and Sondoh Jr (2016, p. 3446), which showed that the relationship between eco-label and green purchase intention in terms of buying green products was stronger for consumers with high educational level (tertiary education) than for consumers with low education level.

Findings show that women have more positive attitudes and behaviour towards green symbols as compared to men. These findings are in line with those by Suki (2013, p. 52) and Chekima, Wafa, Igau, Chekima, and Sondoh Jr (2016, p. 3446) which stated that women are found to be more concerned about the environment as compared to men, and eventually translate these concerns to green purchasing. Thus the relationship between eco-label and purchase intention was found to be stronger for female consumers than that of male consumers.

In relation to the age factor, age groups 18-20 and 21-29 showed to care more about the environment and green products as compared to other age groups. These results are in accordance with research conducted by Suki (2013, p. 55) in Malaysia and Ali and Ahmad (2016, p. 103) in Pakistan which found the same age groups to show more concern about the green environment and greatly influence their parents' purchasing decisions as youngsters. Consumers in rural areas have little confidence and positive attitude toward green symbols as compared to consumers in urban areas.

Recommendations

Recommendations can be made for marketers, companies, government, and for future research. Firstly, it can be recommended that more educational programs be put in place as results show that an individual can have high educational knowledge, but they still lack environmental and green symbol knowledge. In addition, educational programs should also include rural areas as research showed consumers in rural areas to lack more knowledge and a positive attitude towards green symbols. It can be seen from the findings that a high number of consumers cannot recall seeing the green symbols on packaging. It can be recommended that green symbols be made bigger on the package and clearer so that consumers can be able to spot them easily. In addition, green symbols should have a short accompanying message explaining what the symbol means on the packaging as respondents were found to have little knowledge.
Recommendations for future study can also be made. It is recommended that future studies look at what educational programs on sustainability are currently covering to determine the usefulness in terms of achieving behavioural change amongst citizens. Further studies can even go as far as looking at different educational and institutional levels to find how sustainability is being incorporated in the syllabi. That is looking as primary level, secondary or high schools as well as tertiary institutions.

Keywords: sustainability, green marketing, green consumption, green symbols

Urban Sustainability – public transportation and social values What can we learn from the Chemnitz case?

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Sustainability, in urban contexts, often lacks a common perspective, both from a theoretical and a practioneer's view point. Either studies focus on normative orders, on the question what kind of measures are needed to establish or to foster a good public order, others aim to evaluate cases that may not spaek for the general problem.

Chemnitz, a mid-sized town in Saxony, Germany, with large industrial and cultural heritage, lacks economic and political strength. That's why local administration has huge difficulties in promoting and adequate transportation concept. The city is, before all, successful in connecting neighboring small towns to the city's network. Shortfalls can be seen in integrating Chemnitz in the national transportation system.
This paper will analyse the theoretical framework, problems of normative thinking in local politics, describe the current situation in establishing a sustainable transportation system, name the actors in this far-reaching drama, show political needs to solve some of the most urgent problems, and enlarge on some technical aims to enhance this system as part of a new "smart city" in Germany.

Keywords: Normative order, urban sustainability, public transportation

*Speaker

real-time scalable energy storages as the general basis for energy-optimized quarters of the future – a real-world-condition laboratory as experimental space for future smart-city approaches

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Cities of the future have to be designed intelligently, adaptably, sustainably, energy efficiently and socially fair. Against the background of current mega trends (climate or demographic change) specifically sustainable and holistic solutions for the vulnerable housing market have to be created. Housing is a basic need therefore the supply with housing space constitutes a fundamental right. These basic principles form the pillars of future cities. The design of the supply with housing space, energy (power, heat) and also mobility are currently changing rapidly. Topics like sustainability, zero-emission and humane design play a key role in this effort. The affordability of these essential factors is not at least a great (socio-)political challenge in the near future. Urban space with its quarters, buildings and (energy-)infrastructure is one of the leading drivers of climate change and forms the basis for a future-oriented life. The demographic development and its serious impact is especially noticeable in core regions. It also is a central factor for future-oriented, cross-generational concepts of a self-determined and most importantly affordable life.
Resulting from the global climatic, regional demographic and therefore needed infrastructural change – demands for restructuring the technical execution in the electric-thermal supply system are made. Only with the help of novel concepts and systems, which are defined, planned and demonstrated on quarter level, a sustainable and affordable lifestyle can be realized.

For these reasons topics like environmentally friendly and economical transformation of the energy supply (local turnaround in energy policies) and energy efficiency of the quarters as well as the establishment of age-appropriate, affordable housing spaces are prior for the sustainable development of urban regions.

The technical potential of a holistic and also economical energy supply in quarters presents another motivation for the establishment of such solutions. So far most quarters are supplied with heat and power centrally. In the last few years a new way of thinking motivated people to approach a decentralized concept. Especially renewable energies, generated in PV facilities for

*Speaker

power supply or solar-thermic facilities for heat supply were installed numerously. The consequential issues are next to the now needed interoperability of different components, the necessary energy storage on-site as well as an overall system functionality.

The development in the federal politics and the decisions made by the federal government strengthen these approaches. At this point, especially the energy concept and the related resolutions of the federal government on energy revolution are important for the energy system's future design. Among other things the energy efficiency shall be increased to a point, where in 2050 only half of the primary energy consumption of 2008 will be needed.

About 75% of all german inhabitants are living in cities. Therefore cities and agglomerations are extremely relevant spaces of living, economy and culture. As such, they demand a future-oriented, sustainable energy system and highly energy efficient facilities. The building sector is particularly relevant for the increase of energy efficiency: about 35% of the whole energy consumption in Germany occurs in residential and non-residential buildings. The energy revolution, resolved by the federal government (which means the reconstruction of german energy supply, based on high efficiency and the major use of renewable energies) can solely be implemented, if not only the electricity market, but also the heating market will be transformed. With regard to the energy and climate policy, to have an almost climate-neutral building stock until 2050, next to an increased energy efficiency the renewable energies have to be integrated largely. Cities and agglomerations provide – thanks to their leverage effect - the possibility to implement technical and social innovations very rapidly and therefore to reach the energy policy objectives. [see BMWi und BMBF 2016].

To realize these goals, innovative approaches at the level of municipalities or quarters are needed. By developing a sector-linked area to maintain the energy supply on black days and to avoid a DE-CIX-disturbance as well as by building intelligent and networked energy storages to involve renewable energies even more – a transferable, scalable system, which drives the energy revolution in Germany significantly forward, will be formed.

An appropriate, holistic, system-oriented approach contributes to ensuring a sustainable supply in all aspects of life and thereby provides an overall societal risk provisioning while allowing developments, even up to smart cities.

In order to create such future-oriented structures, it's necessary to test these solutions prototypically in different areas or quarters under real-world conditions and to integrate them into current systems. As a tool for the systems's demonstration and test, so called real-world-laboratories seem appropriate. In the definition of BMWi, real-world-laboratories of the energy revolution aim at a holistic approach to test technological and non-technological innovations under real-world conditions. These also include technology-related innovative business models. Real-world-laboratories should show a systemic dimension and include the testing of technological and non-technological innovations in a relevant, industrial dimension. To accompany this, socio-economic aspects as well as social issues and questions concerning future market models, business models and regulatory regimes should be researched. Real-world-laboratories therefore provide the possibility of regulatory learning by detecting which valid regulatory provisions may complicate the widespread use of a certain technology - and if without changing provisions possible – addressing them. Such a laboratory can also contribute to supporting traditional energy regions, which are affected by structural changes, with the help of energy- and industrial- political perspectives. [BMWi 2019]

An approach for a real-world-laboratory, focused on real-time scalable energy storages as a basis for energy-optimized quarters of the future can be seen as blueprint for a holistic future

supply with electrical and thermal energy as well as the integration of mobility can be seen as a link. Thereby the main drivers of energy consumption traffic, industry, businesses and housing are being detected universally. In doing so the real-world-laboratory can tackle the significant systemic challenges of Germany's energy policies in a major project exemplarily.

The real-world laboratory has a pioneer character for the transformation of the energy system and addresses research questions, which are key for implementing a turnaround in energy policies. It's the laboratory's overreaching object to demonstrate the linking of different sectors and to realize an affordable energy revolution with the help of innovative power plant structures. This includes the development of renewable, regenerative energies as well as the use of intelligent storage solutions, which integrate the recorded energetic and caloriemetric consumption into an edge-conform platform. The development's staring point is the installation of different dimensioned electric mass storage systems, which are spread on explicit places throughout the city and are connected virtually. The particular locations represent different sectors of the energy system. On the one hand quarter storage solutions or grid-assistive energy storages at charging stations are built, on the other hand grid expansion regions are supplied by emerging e-bus lines to avoid a grid expansion. The additional integration of an industry storage aims at the improvement of fast-charging possibilities for electric vehicles. Another important point is the usage of short-term mobile energy storages in electric vehicles of all types. The various storage systems are linked by an appropriate ICT-infrastructure and therefore form a virtual mass storage, which is characterized by high performance and flexible real-time scalability. Consequently, the load distribution of the electric power grid with its different actors can be controlled highly flexible, depending on each particular initial situation. The required development of ICT-infrastructure with energetic and telecommunicative elements has to be secured appropriately (since it's a critic infrastructure) and also has to be prepared for the future 5G/6G networking strategies (smart city 5G approach).

Next to the real-world laboratory's planned technical innovations, innovative approaches concerning virtual mass storages in the operating model an when developing quarters and cities are required. The usage of waste heat, which occurs in the fast-charging process, is only one new approach, that hasn't been detected and researched yet. The fast-charging process can not only be examined on electric vehicles, but also when charging an electric mass storage. When operating a power plant, energy efficient and legal aspects have to be considered. The innovative approach is based on dissolving the quarter-hours paradigm, which is possible thanks to real-time scalable storage sizes.
New demands on the operating model are resulting and new approaches for transaction management for automatically finishing micro-contacts in real time are necessary. The planned real-world laboratory is an important contribution in the direction of smart city development and shows the impacts on quarter- and city-building processes as well as the involvement of all urban functions. One important component is the use of electric vehicles as a local, mobile energy storage with the automatic registration in the grid and an appropriate exact settlement. In all these developments, the effects on humans, their living environment or the direct environment have to be considered. In previous technology projects, these topics often were not regarded enough. The planned real-world laboratory is going to change that, because it allows realization and demonstration inside the quarters with citizens on-site. This project approach combines the so far numerous ignored perspectives and strives to create a holistic system as basis for future intelligent cities.

Keywords: sector, linking, smart city, energy storages, networking, ICT, IOT, virtualization, digi-

tization, innovative power plant structures, renewable energies, energy revolution

The usage of Information and Communication Technologies (ICT's) to ensure multi-stakeholder engagement in the implementation of local economic development (LED): The case of eThekwini Metropolitan Municipality

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Background and objective of paper:

There is evidence that Information and Communication Technology (ICT) plays a crucial role in the enhancing multi-stakeholder engagement in the both developed and developing countries. Research has shown that the over the years many countries and institutions have used ICT as the tool of communication. Recent evidence suggest that various organizations, both public and private who have invested in ICT have grown meaningfully, and in particular as a result of enhanced e-participation. Previous studies of public participation in eThekwini Metropolitan Municipality have not dealt with adoption of e-participation in the implementation of socio-economic programmes and projects. Most studies in the field of public participation have only focused on ward committees as an only mechanism to enhance multi-stakeholders engagement. Nonetheless, the organization and entities should ensure that these ICT tools are implemented properly and adequately. The objective of the study will be to examine the usage of ICT in pursuing e-Government in the implementation of LED projects in eThekwini Metropolitan Municipality. This study uses the qualitative case study approach to investigate the usage of ICT

*Speaker

in the implementation of LED projects in eThekwini Metropolitan Municipality. Both primary and secondary data will be used in the form of interviews, journal articles, government reports, e-government magazines and newspapers, textbooks, unpublished dissertations and working papers. Since the study is qualitative in nature, the probability sampling will be adopted in the form of non-probability sampling technique to select the participants.

Problem statement:

The *Constitution of the Republic of South Africa* (1996) in the Bill of Rights state that every citizen is entitled to accurate and adequate information held by state department or public entity. The *National Integrated ICT Policy White Paper* 2016 encourages the utilization of ICTs to ensure more inclusivity and equal society to eradicate inequalities and poverty as it is enshrined in the National Development Plan (NDP) in South Africa. Additionally, the e-government on the South African perspective is guided also by the *White Paper on Transforming Public Service Delivery* of 1997, which is known of Batho Pele White Paper with eight public service principles (Murenzi and Olivier 2017). These legal frameworks aim on improving service provisioning and transforming society in democratic South Africa. Moreover, these policies focuses on creating knowledgeable and innovative society. The utilization of traditional methods of communication and engaging stakeholders have failed over the centuries globally and locally. In today's world the almost the third majority of the world's population is exposed to technology and social media. The most popular social networks platform includes Instagram, Facebook, Twitter, LinkedIn and others. The previous studies have shown that the adoption of ICT by government to disseminate information can play a vital role in the allocation of allocation of basic services and meeting the expectations of the citizens (Mutula and Mostert, 2010; Mawela, Ochara and Twinomurinzi, 2017 and Webb, 2014). A recent study state that the benefits of e-government have promoted the efficiency and effectiveness in the distribution of resources, minimizing unnecessary costs and improve openness and transparency in the public service (Abdulla, 2015).

However, it is said that the South African municipalities are faced with numerous challenges of poor service delivery. The challenges stem from not involving all stakeholders in the problem-solving and policy-making processes in the matters that affect them. The lack of active public participation leads to bureaucracy, maladministration, undue delays and dilapidated infrastructure. Generally, the use of ICT by developing countries with the specific reference of local municipalities is still a pressing challenge (Murenzi and Olivier 2017). The importance of encouraging the e-participation through the adoption of new technologies methods in order for public entities to achieve the efficiency and effectiveness in the execution and meeting the citizen's expectations. In the same vein, the adoption of e-government by public institutions improve transparency in the distribution of scarce resources. Furthermore, the purpose of ICT in public sector is to ensure that there is an accessibility and accountability towards the allocation of services. Numerous studies by several scholars highlighted the significance of e-government as the tool to increase efficiency, cut cost and improve productivity in the public sector (DiCaterino and Pardo, 1998; Al-Busaily, 2011; Lupilya and Jung, 2015). Likewise, the e-government focuses primarily on three aspects adaptive and improved service provision (e-service delivery), e-democracy (digital democracy) and participation of citizens/businesses in the governance processes (e-participation) (Schwester, 2009; Abu-Shanab and Khasawneh, 2014).

Although, the adoption of e-government is the solution, in the developing countries particular in the Sub-Saharan Africa (SSA) there are some limitations that hinder the effective utilization of this tool. Some of these challenges includes, poor ICT infrastructure, especially in rural areas, illiteracy, digital divide and high cost of data (Anjoga, Nyeko and Kituyi, 2017). Similarly, Murenzi and Olivier (2017) postulate the shortcomings that affect adequate usage of ICT in the most of Southern African countries namely, being illiteracy among users, lack of accessibility

to ICT devices, bureaucracy and rigid policies. These have led to undue delays, mediocrity, wastage, bureaucracy, mismanagement of resources and the state of anarchy (Cloete, 2012; Heerden & Rossouw, 2014). Some scholars, have argue that the security and safety of personal information of individuals remain a challenge in the implementation of e-government system (Al-Khouri and Bal, 2007; Bwoma and Huang, 2003). Due to this, many individuals can be exposed to illegal access to other people private information and losing citizens trust, which might result to the failure of government e-government.

Nonetheless, the South African government need to acknowledge the successes and failures of e-government and learn from other countries like China, Singapore and India (Pillay, 2012). Based on the findings of the previous seminal work conducted, the study recommends that all citizens must have access to internet, particular in rural areas, encouraging ICT literacy amongst the citizens, introducing awareness campaigns about the benefits of ICT regarding service delivery. The question arises, whether the adoption of ICT and, e-participation will lead to enhanced good governance and resulting improved local economic development, is explored in this research paper. This study sought to examine the role of e-government system in public administration domain and encourage the usage of e-government in the developing countries.

Methodology:

The study will be exploratory and inductive in nature. The paper is an empirical study into which eighty semi-structured interviews will be conducted, and the result of the study is qualitative research. The study will be conducted in eThekwini Municipality, which is one of the 278 municipalities and is amongst 8 metropolitan municipalities in South Africa. The eThekwini Metropolitan municipality is the centre of most municipal offices and most industrious municipality in KwaZulu Natal. eThekwini Metropolitan have a highest population density that is approximately around 3 752 850. The target population will be based within 21 wards of Inanda, Ntuzuma and KwaMashu (INK) area. The sampling technique to be used will non-probability (purposive sampling). The sampled size for the study will include the following: INK Area Based Management Manager, two Ward Councillors, the Information Technology Manager, three Ward Committee Members and Area Project Manager. The interviews will recorded on the voice recorder and transcribed verbatim. The data collected will be subjected to data quality control to ensure validity, reliability and trustworthiness of data. The data obtained will be uploaded in Nvivo software and data will analysed into themes and sub-themes which is the thematic analysis. Moreover, thematic analysis is the qualitative method of analysing raw data into manageable data (Vaismoradi et al, 2013). The study will ensure that ethical aspects are observed such as voluntary participation of participants, anonymity, confidentiality, protection from harm and consent form. While it can be said the ICT infrastructure is effective in improving active citizen engagement at local government, these findings point to a need to capacitate and empower citizens using mechanisms that are accessible and friendly. The insights from this study contribute to a growing body of literature and theories related to stakeholder engagement.

Impact and outcome of research:

This paper will focus on how the adoption of ICT and e-participation will affect the governance of future cities, with specific reference to the eThekwini Metropolitan Municipality, and the impact that it will have on local economic development through the improvement of multi-stakeholder engagement. This study will also focus on the benefits and limitations that might constraints the utilization of e-government system in South Africa. The paper also examine the current practises in the public administration or public sector in South Africa. The outcomes of this research will ensure that the South African government identify the mechanisms that can be used to improve e-government system. Moreover, the contribution of the study will be

promoting the adoption and utilization of e-government and in helping the various stakeholders to gain a deeper understanding of active multi-stakeholder engagement. Finally, an adoption and implementation of e-government system as tool in public sector is close the policy gap and addressing the legacy apartheid.

Keywords: Digital divide, e, Government, e, Participation, Future Cities, ICT, service delivery, social media, good governance and sustainable development

E-PARTICIPATION AS A MECHANISM STAKEHOLDER ENGAGEMENT IN THE GOVERNANCE OF THE CITY OF HARARE'S INFORMAL ECONOMY SECTOR

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E-PARTICIPATION AS A MECHANISM STAKEHOLDER ENGAGEMENT IN THE GOVERNANCE OF THE CITY OF HARARE'S INFORMAL ECONOMY SECTOR

Theme: Future Cities: Alternative Governance and Innovative Technologies for Sustainable and Smart Cities

Background

A growing corpus of literature demonstrates that electronic participation (e-participation), as a part of e-governance, has in recent decades proved to be an effective means through which government at different levels of spheres can engaging the citizenry (Conroy & Evans-Cowley, 2006; Macintosh, 2004). Proponents of e-participation argue that the adoption and application of innovative ICTs in the governance of cities allow a wider audience to engage and deepens the level of democratic debates issues that affect citizens and sustainable and smart cities (Macintosh, 2004). Some studies have explored the impact of e-participation by examining the levels of satisfaction by citizens and government responsiveness to it. For instance, drawing on the rich and extensive data from a 2009 E-Participation Survey in Seoul Metropolitan Government, Kim and Lee (2012) in established among other things, the satisfaction of citizens with e-participation and government's responsiveness high and to some extent reaching Arnstein's (1969) higher levels of degree of participation. The compelling theoretical and practical argument for the e-participation is plausible and its intuitive appeal has seen many governments, particularly at the local level, establishing infrastructure for it. For instance, the Ministry of Communication and Information of Singapore has an online site named *Reaching Everyone for Active Citizenry Participation @Home*, where citizens can participate in public policy matters (Government of Singapore, 2019). Although this platform is bi-directional, and only communication between government and citizens to the exclusion of important debates between citizens themselves, it

*Speaker

has proved to be an effective way of improving citizenry participation in policy issues that affect their lives. The Singaporean example is one example e-participation out many such cases in North America and continental Europe.

Problem statement

Cities in the emerging economies, particularly in Sub-Saharan Africa, are beginning to leverage the power of ICTs by incorporating e-participation as the key mechanism of public participation (Mawela, Ochara, & Twinomurinzi, 2017; Wakabi & Grönlund, 2019). However, there seems to be an overwhelming consensus among scholars on its lack of effectiveness. Among the reasons often cited for participation's lack of effectiveness are low internet use and authoritarian contexts (Wakabi & Grönlund, 2019) and, access to resources, leadership, ICT skills and funding (Mawela et al., 2017). However, much of the research on the e-participation in the emerging economies is largely descriptive and does not seem to take the views of the citizens who are the major stakeholders in public participation in the cities.

Objective of Paper

At the backdrop of this, this paper sought to contribute to the growing body of literature on e-participation as alternative governance and innovative technologies for sustainable and smart cities by providing insights into its application or lack thereof in politically polarised cities such as the City of Harare. In doing so, the paper draws strongly on a case study of the City of Harare in Zimbabwe and data gleaned through surveys and documentary analysis.

Methods:

The data for this study emerged from a broader project that used interviews with purposefully selected informal traders and their customer participants (N= 195) randomly chosen for the surveys. The survey questionnaire included four broad themes of alternative governance and innovative technologies through e-participation namely, policy formulation, institutional design, facilitative leadership, and collaborative process in order to gain perspectives on and perception of flea market governance and participation. In administering the questionnaire, this study used intercept interviews (Hornik & Ellis, 1988). Further data were gleaned through internet search and documentary evidence.

Findings

The study established that the combined with debilitating economic challenges which have resulted in sky-rocketing prices and diminishing disposable incomes, respondents have limited resources to spare and therefore cannot afford to buy data and be actively involved in various ICT platforms. E-participation has, therefore, become a victim of the economic challenges as respondents cannot choose this participatory tool that can reduce economic damage to their livelihoods. For instance, data costs and frequent power outages are a huge barrier to the application of alternative governance and innovative technologies for sustainable and smart cities. The hostile and polarised nature associated with draconian laws of censorship often acts as deterrents for meaningful e-participation.

Impact of research

The paper builds on and contributes to the discourse of e-governance in general and its application in emerging economies where democratic consolidation is very low and the digital divide is wide. In general, therefore, this study not only highlights the importance of e-participation

by underscored the need to understand the context of its application. The insights gained from this point to the need for public administrators have a good understanding of the technological development and the nature of politics. Even within one city, public policy practitioners should understand the heterogeneity of such variables to determine the suitability of e-participation of a mechanism of public participation. These findings have profound implications, not just for Harare but for other cities with similar political and economic outlook. To the scholar community, this study acts a springboard for asking more precise questions at a broader level and the development of e-participation theory.

Keywords: e, participation, alternative governance, ICTs, public participation

Will urban futures be dependent on access to major transportation hubs? An evaluation of the Aerotropolis concept to promote socio-economic development: The case of the Durban Aerotropolis.

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Successful future cities may be closely linked to major transportation hubs, and excellent logistics platforms that can influence agility and responsiveness in the movement of products and commodities. Aerotropoli (smart airport cities) are known as developments of excellence both in business, but also supporting and supplying excellent governance and management of public services associated with investment and doing business by foreign investors and business persons. This new approach to airport development and associated industrial and commercial land use is characterized by large scale urban development's built around an airport, focusing on business developments in the so called "first mile" area, offering rapid and world class logistics and connectivity to suppliers, customers and partners locally and globally. Apart from the notion that an aerotropolis can become a fully integrated and modern smart city, they flourish on logistics and commercial facilities and services that emanate from and support aviation-linked business. Closely linked to the physical regions often known as a special economic zone (SEZ), are shopping malls, hotels, hospitals, dining, and entertainment facilities and venues.
Aerotropoli usually flourish in the fields of innovative, and high-technology and high-value added sectors, and mostly linked to cities who are popular tourist destinations, and foreign direct investment destinations. Aerotropoli are also often associated with special economic zone developments that are envisaged in so called "green field" contexts allowing for maximum utilisation of land in the surrounding precinct, and innovative and novel developments to attract potential foreign investment. The concept has gained prominence in different regions across the world and the focus among developers has been aimed at ensuring that enabling logistics models and systems are adopted in order to maximize on the economic benefits associated to the concept.

John Kasarda (2011), who has been a prominent academic and professional consultant to companies and governments in the field of modern airport cities has commented on this attitude in a seminal work on future airport cities; *Aerotropolis - The way we'll live next.* He argues that:

"Airports have traditionally been viewed as places where aircraft operate and passengers and

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cargo transit. This traditional understanding is giving way to a broader, more encompassing model which recognizes the fact that along with their core aeronautical infrastructure and services, virtually all major airports have incorporated a wide variety of non-aeronautical facilities and services...but it is more than a transport complex: It is a strategy...

That is, an aerotropolis is a constellation of physical, institutional, economic and policy interventions which upgrade local assets, reduce ground-based transport times and costs, and expand global connectivity to leverage aviation-enabled trade in goods and services for business competitiveness, job creation and prosperity of those at all socio-economic levels.

Objective:

This paper aims at evaluating the aerotropolis concept, and also assess the impact that aerotropolis developments could have on African cities of the future; the promotion of local economic development, social development, in particular the importance of their transportation and logistics structures to enhance socio-economic growth. The importance of regional, local and institutional capacity to ensure that this new large scale urban development concept can be a critical catalyst for development. This paper seeks to answer the question: Can the Durban Aerotropolis, become a major contributor to local economic development (LED), and be exemplary to other developing cities globally?

Methodology
This paper will use a comparative case study approach to evaluate and assess aerotropoli in general, and will also focus on the vision and the existing performance of the Durban Aerotropolis, which is closely linked to the South African Government's 2030 National Development Plan (NDP) vision, and that of developing the Province of KwaZulu-Natal into becoming a premier gateway to Africa. For the research objectives to be attained a mixed methods data collection approach will be implemented that involves the various stakeholders including those in the public sector who have been actively involved in the development of the Aerotropolis masterplan and also businesses and passengers who are considered as users of the strategy. The data collection process involved rigorous in-depth interviews, focus groups, observations and questionnaires.

Keywords: Aerotropolis, large scale urban developments (LSUD). Urban governance models, innovation, local economic development (LED), smart cities, logistics platforms, Special Economic Zones (SEZ).

Modelling the diffusion and acceptance of sustainable innovations in refugee camps: the case of hydroponic agriculture

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Purpose: The objective of making operations in refugee camps more sustainable is dependent upon the introduction and diffusion of sustainability innovations. As economic, environmental and social aspects of such innovations are closely interlinked while various actor groups are involved, effective decision-making support needs to take a comprehensive systems perspective. Against this background, we explore key leverage factors for the gradual diffusion and acceptance of hydroponic agriculture as an example of sustainability innovation diffusion.
Method: Our study is motivated by empirical longitudinal case study data about the introduction of hydroponic vegetable cultivation in Al Zaatari camp in Jordan. We build a system dynamics model that embeds the innovative agricultural practice within the social, economic and cultural setting of the camp as well as its adjacent host region, while taking into account political constraints that prevent building of permanent structures. We conduct several sensitivity analyses for exploring key leverage factors that determine success or failure of hydroponic agriculture in the camp.
Contribution: We expect to find that refugees benefit from their participation in hydroponic agriculture as additional source of income and for increasing food security. However, success of the innovation depends on the reference market price level for vegetable products in the surrounding region. Moreover, refugees' cultural pattern of gender-based "appropriate work" prevents broader acceptance of this form of agriculture. Through our system dynamics modelling and simulation approach, we respond to the lack of in-depth analysis of how to make sustainable innovations acceptable for refugee camp dwellers. We contribute to humanitarian operations management theory by highlighting specific trade-offs that arise from the introduction of operations innovations and by pointing to behavioural norms as determinants of innovation acceptance in a camp setting.

Keywords: Humanitarian Operations, Refugee Camps, Sustainable Innovations, Systems Dynamics

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A collaborative approach to identify threats and secure the smart grid in South Africa

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Fully automated power grids, which include every customer and node, will be the trend of future electric systems, as presented in the "Grid 2030" vision of South Africa (Sustainable energy Africa, 2019). The smart grid bring together all elements of the electricity system production, delivery and consumption closer together to improve the system operation for the benefit of consumers and the environment (Alaqeel & Suryanarayanan, 2019; de Wildt, Chappin, van de Kaa, Herder, & van de Poel, 2019; Mohanty, Choppali, & Kougianos, 2016; Shokoya & Raji, 2019). This approach recognizes that the electric grid is changing from a relatively closed system to a complex, highly interconnected environment (National Institute of Standards and Technology, 2010). Under these circumstances, threats to grid security inevitably multiply and diversify due to the high integration that leads to operational interdependencies from the most critical systems to the simplest. As a result, it gives rise to a huge attack surface whereby the exploitation of one system damages the whole infrastructure and communication (AlDairi, 2017; Farahat, Tolba, Elhoseny, & Eladrosy, 2019). Understanding how individuals, organisations and communities identify threats to the smart grid security is essential to securing this vital infrastructure and ensuring safe and reliable delivery of high-quality electricity (National Institute of Standards and Technology, 2010). Hence, the objective of this paper is to understand the role of the practices of individuals, organisation and the community influence threat identification and overall security of the smart grid. We argue that an important part of the problem is the fact that most stakeholders in the energy sector have been conducting security initiatives that are not collaborative. However, conducting security initiative independently will not safeguard the smart grid because of different practices performed by various players. In addition, smart grids introduce a two-way communication with customers making each role played by stakeholders in each domain to secure the smart grid vital. We aim to address this problem by proposing a solution that could aid the state and other smart grid stakeholders to address the issue of security through a more collaborative effort. We show that this collaborative approach could dramatically simplify the complexity of safeguarding the entire smart grid.

Keywords: Smart grid, cyberattack, security, energy, collaboration

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Sustainable Tourism: Need for Future

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Tourism has experienced constant expansion and diversification thereby becoming one of the world's highest as well as fastest-growing economic sectors (Lozano-Oyola, 2019). To continue tourism as a long-term sector with an extraordinary capacity to generate richness, it must respect the environment's loading capacity and the quality of life of the host citizens. Increased tourism has led to significant economic benefits, but it also causes pollution and unbalanced development, which is severely degrading the environment. This might force local population to reject surplus tourists. Growing dissatisfaction with conventional mass tourism as a capable vehicle for attaining holistic sustainable development goals has been a primary trend in tourism literature since the 1970s (Weaver & Xin, 2016). This highlights the importance of policies for the conservation of the environment compatible with the local values, there being an improvement of competitiveness and tourist productivity. The defining of effective strategies to promote sustainable tourism development requires a measurement system that fulfills a double aim: to value the relative position of each territory and to know experiences, policies or projects elsewhere to reformulate the development processes. In this study, we emphasize the case of Amsterdam, as it is one of the most affected European destinations by over-tourism (Stanchev, 2018). Amsterdam is the capital of the Netherlands and known for its rich artistic heritage, which includes canals, museums, beautiful ecosystem. The canals are the backbone of this beautiful city. They serve various functions such as defense, water management, and transport. Because of their biodiversity, wildlife habitats, ecological environment, and fishing villages, Amsterdam constitutes a nature-based tourism destination that offers leisure, recreation, and tourism for tourists/recreationists. Although increased tourism has led to significant economic benefits, it has also caused pollution and unbalanced development, which have severely degraded the environment and canal ecosystem.

To have sustainable and economically stable Amsterdam, it is mandatory to antedate the climate changes that may take place during the coming decades in the Netherlands. KNMI (Royal Dutch Meteorological Institute) has developed four climate change scenarios based on IPCC reports in the Netherlands (Hurk et al., 2006). Variables in these scenarios are the extent of temperature rise, 1 degree C or 2 degrees C in 2050, and the change in wind pattern in Western Europe. The sea level will rise with an absolute rise in 2050 between 15 and 35 cm, an effect that is enhanced by land subsidence in the western part of the Netherlands. Climate change will also affect the city of Amsterdam. The adverse impact of pollution caused by the increased

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number of tourists that is harming the ecosystem. Environmental implications for the protection of biodiversity or its restoration where the latter has been already compromised, and appropriate mitigation or adaptation responses to climate change should be implemented. A challenge, in either case, is the tendency of tourists to respond to degradation by diverting to better-endowed destinations.
Why is it important?

The term sustainable tourism emerged in the late 1980s and has become firmly established in both tourism policies and strategies and tourism research. According to stakeholder theory, numerous stakeholders, including tourists, hosts, governments, non-government organizations (NGOs), for-profit organizations, and other tourist-related businesses may be involved in the development and implementation of sustainable tourism. Sustainable tourism requires both an awareness of tourism activities that have relatively low impact on nature and a consideration of whether all stakeholders' support is warranted. It is essential as the tourist places can be conserved only when all stakeholders take part equally and actively. The process of conservation of natural ecosystems and sustainable tourism is an effort that also requires extensive support especially from tourists visiting them.

- What did you do?

The articles put a shine on issues of importance within sustainable tourism and investigate the inter-relationships between societal sustainability and tourism. An exploratory-descriptive qualitative research design was adopted. The open-ended semi-structured questionnaire was developed, which enabled the researcher to conduct an in-depth investigation of the phenomenon. We chose snowball sampling as it allows the selection of respondents who were in the best position to provide information and were interviewed in person or via phone. The questionnaire was pilot-tested, and questions were added on their recommendation. The Delphi method originated from the RAND Corporation in the 1950s. It is a widely used group-decision-making approach for managing complex problems for which precise scientific information has not yet been obtained. It involves facilitators who lead the responses of a panel of experts through two or more rounds of surveys. The structured communication process is stopped according to predefined criteria, to achieve consensus (Doke & Swanson, 1995). Wassermann et al. (2011) (Wassermann et al., 2011) used the Delphi method to link public acceptance with expert knowledge on various questions related to CO2 storage. The Delphi approach can enhance the transparency of expert judgments and help communicate the results to the public. Alyami et al. (2015) used Delphi, involving experts from Saudi Arabia, government, academia, and industry, to reach a consensus for building assessment methods. Due to the uncertainty as well as the complexity of the problem statement, a system thinking approach was used (Koslowski et al., 2011). System dynamics models are causal mathematical models where the underlying principle is that the system structure helps to predict behavior. The system dynamics models also help to address uncertainties with regards to future changes (trends) in the system structure. System Dynamics (SD) helps in determining the distinguishing ability of various dynamic forces to predict future consequences of presently taken actions and managing the right decisions to get the desired outcomes (Sterman, 1994). The SD method has been widely adopted for many sustainable development studies (Tan et al., 2018).

In summary, the System Dynamics (SD) approach, helped to develop an effective Decision Support System (DSS) to address the issue of pollution related to increased tourism. An SD model, based on the driving-force, state, and response indicator set, was used to enable the integration of the various interlinked factors causing this problem. This DSS enables decision-makers to perform scenario analysis by allowing them to incorporate their deci-

sion preferences.

- What did you find and recommmend?

The simulation results show the dynamic changes of ten significant variables of the DSS framework, namely TOURISM AREA, number of tourists (TOURIST), quality of life, local population (POPULATION), POLLUTION, state of the ecosystem (ECOSYSTEM), environmental pressure (ENV PRESS), economic value (GROSS NATIONAL INCOME) and TOURISM INVESTMENT and TOURISM REVENUE. The simulation is done for a period of four and ten years. The results highlight that if strict and appropriate measures are not taken then Amsterdam can have serious problems affecting natural ecosystem and canal system.

Observations

- As the number of tourists is increasing, the pollution in the canal ecosystem is increasing, thereby depleting the natural ecosystem.
- The simulation highlights that the pollution index has increased 9.42 times in four years. If the current rate will be followed and no strict measures are taken, then it is expected to reach 116.09 in the coming ten years.What
- The danger remains that the rhetoric of sustainability does not translate beyond attractive marketing and promotion-speak. Such discourses may be seductive, but facing the sustainable tourism challenges is a grubby business of bringing diverse stakeholders together. Hence, government should foster communication and cross-fertilization of ideas among various stakeholders within the tourism research community and with other research groups.
- Relevant social campaigning is needed, aiming to achieve desirable social and environmental outcomes.
- *Responsustable tourism*, i.e., responsible and sustainable tourism, can only save natural resources.
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Keywords: sustainable tourism, system dynamics, decision support system, tourism, Amsterdam, ecosystem, causal loop diagram, stock and flow diagram

4. The Art of Changing Habits: Aesthetic Research to Ecologize our Lifestyles (Presentation of Projects and Workshop)

The Evolving Roles of Games in Translating Scientific and Technological Findings into Individual and Societal Visions and Motivations for Transitional Actions to 'Truly Sustainable Systems.'

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Encouragingly, there is an increasingly strong societal will and commitment to make transitions to more sustainable practices. In that context, implementation of the Sustainable Development Goals (SDGs) within the Planetary Boundaries, provides the framework for educators active in education from "Kindergarten through Life-long Learning," to catalyze the needed, ethical, social, economic, ecological, political and technical transformations. The challenges of sustainable development education with the need for interdisciplinary knowledge, skills and attitudinal education with a special focus on the urgent needs for paradigm changes and practice changes to ensure that we make progress toward sustainable societies (Thürer et al., 2018). Solving 'non-typical' problems is essential, therefore, creativity and innovation, flexibility, positivity and resilience, adaptability, and openness to the unknown are a few of the competencies that are essential for students of all disciplines (Martins et al., 2017). For improving creativity indices, simulation games have been found to be important. An experiment with Master's students in Mechanical Engineering at Politecnico di Milano showed that their creativity indices were improved through using games (Cascini et al., 2015).
In the context of continued rapid human population growth, species diversity losses, increasing temperatures and growing societal inequities, there is a great urgency to use new types of games to inform and empower students to co-play, to co-envision and to co-implement truly sustainable societies that function within the Planetary Boundaries of Planet Earth. Games have been important in all cultures, for people of all ages, for thousands of years. Through diverse types of games, humans usually used, 'Win-Lose' games such as those in the Olympics, Wars, Economic Competition, and other types of Competition. Recently, new visions about

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games are evolving, wherein "Win-Win" outcomes are central to the game's objectives (Dieleman and Huisingh, 2006). Some of the new approaches have resulted in the development and implementation of more than forty alternative business models, which revolve around concepts such as "Sharing Economies," "Circular Economies", "Equitable-Sustainable Economies,", "Net Regenerative Cities," and "Regenerative Agriculture."

Apart from traditional approaches to games as of awareness creating and experience-based forms of education, games have become a mean for the idea and solution development. This goal orientation of games is mainly subsumed as "serious games", which refers to a combination of playfulness and goal orientation (Schulz et al., 2015). Hence, gaming gets a further dimension as not only creating experience and understanding but also as a means to reveal creative potential and therefore to trigger the development of new solutions. Gaming provides the possibility to grasp the complexity and to convey comprehensiveness in an understandable way, since not only cognitive perception is addressed but also embodied activity, which reveals emotion and experience.

The facilitators of this workshop will engage participants in several games about ways to transition from 'unsustainable to sustainable' policies, production-consumption systems, life-styles, and equitable economic systems, which will help society to bring the 'concentration of greenhouse gases (GHGs) back down to 350 PPM. We have to dramatically reduce the catastrophic climate change risks that will worsen if we continue to increase GHS concentrations several PPM per year. Be reminded that, during the summer of 2019, the carbon dioxide concentration increased 427 PPM, which is higher than it has been in several million years!!

Yes, bringing it back to 350 PPM will be a giant challenge, but what are the options if we don't?? We hope that the games in which we will engage you, will help us to learn how to enable our students, colleagues, corporate leaders, political leaders, NGO members and society as a whole, to work together to "Accelerate the Transition to Equitable, Sustainable, Livable, Post-Fossil Carbon Societies."

The proposed contribution will be connected with sequences of concrete gaming experiences on the topic.

Keywords: Awareness; Creativity; Innovation; Games; Sustainable Systems; Education; Cognitive perception; Embodied activity; Workshop.

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Keywords: Awareness, Creativity, Innovation, Games, Sustainable Systems, Education, Cognitive perception, Embodied activity, Workshop.

Playful interventions and their impact on idea generation workshops

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While technological development is constantly improving, the expectancy and demand for new products and services increase rapidly. Using creativity as an input for future innovations is considered as a vital strategy for the survival of companies (Oldham & Da Silva 2015). For this purpose, innovation processes are introduced as systematical and goal-oriented models to accelerate and structure ideas. After the identification of search fields concerning the determination of the matter in question, the first ideas will be articulated and created in the next step by the creativity of the employees. The usual way to practice this is by conducting idea generation workshops. The success of idea generation workshops relies heavily on the use of creativity techniques and approaches. Those kinds of workshops are meant to strengthen the goal-oriented and systematical search for ideas in order to execute the innovation process. Nevertheless, the uncertainty of how to enable the generation of ideas or innovations best still remains. However, other forms of approaches or interventions in the context of organizations have shown that they provide access to enough possibilities to feel creatively stimulated and intrinsically motivated to express new thoughts and perspectives. The urge for these kinds of interventions or approaches in organizations rose "as cultural and innovative industries emerge, consumers are increasingly interested in the elements of aesthetics, design, and experience" (Cheng et al. 2018: 170).
In the organization and company environment, the following intervention types are widely regarded as catalysts for engagement: Artistic interventions (Antal 2014; Clark & Mangham 2004b; Darsø et al., 2006; Larsen, 2005; Badham et al. 2016; Meisiek, 2004; Westwood, 2004; Kudrowitz 2010), Tool-kit based modeling modeling (Sanders and Stappers 2014; Schulz et al. 2013,2015, 2017, 2018; Pässilä 2013; Roos et al. 2004; Statler et al. 2009), and gamification interventions (Deterding et al. 2011; Hamari et al. 2012; Roth et al. 2015.; Zichermann and Cunningham 2011; Bunchball 2012; Burke 2012; Patricio et al. 2018).. The common ground for all types of interventions is that they have a free-flowing, but also meaningful character. This free and meaningful pursuit resembles the concept of playfulness and the theory of Homo Ludens by Johan Huizinga heavily. Huizinga elaborately names "free" as one facet of play, since we are not particularly willing to play for the fulfillment of a practical task or tangible goal, but rather "for the sake of the lived quality that attaches itself to the act of playing." (Rodriguez 2006: 2). The characteristics of the interventions can also observe this pursuit: The purposely escape from conventional corporate routines by partly playful elements like staging a play, applying tool-kit based modeling, or being involved in a game-related situation leads to an expansion of possibilities and a shift in the state of mind. Even the aspect that interventions enable a meaningful character can be explained by referring to playfulness: Playfulness has the power to convert non-serious contexts into serious and meaningful endeavors. According to the significance of playfulness as a central factor, the term playful interventions will be cultivated in this paper.

*Speaker

Compared to the use of idea generation workshops in the early stage of the innovation process, interventions are used as springboards and slightly anarchic elements to provoke new ideas. Those interventions evoke an interdisciplinary working and thinking approach that prompts different streams of inspiration to enter the corporate world by intervening in organizational routines and operations and eventually promoting innovations. Though playful interventions are already integrated in corporate fields as a springboard for engagement and stimulations, a goal-oriented and structured idea generation is not the objective so far.
In order to combine the benefits of interventions with the systematic and goal-oriented manner of idea generation workshops, this study scrutinizes the motives of the three playful interventions-artistic intervention, toolkit-based modeling and gamification - and offers an extract of the central effects and elements of the playful intervention approaches. With this in mind, the goal is to find out if the implementation of playful intervention elements in a systematic idea generation workshop can enhance the quantity and quality of ideas as well as the workshop experience for the participants. For this particular reason, we conducted six workshops with a playful intervention setting at a German original automotive manufacturer (OEM), which served as our case study organization for this research. Furthermore, a link to the characteristics of playfulness in the above-listed interventions will be made. Eventually, further suggestions for future investigations will be stated by interpreting the outcome of the case study workshops.
The explorative empirical multi-case study, we describe how the three illustrated approaches – artistic intervention, toolkit-based modeling, and gamification - were applied to enhance three different idea generation workshop series (consisting of 2 workshops each) for company-relevant and future business topics of a German original equipment manufacturer (OEM) in the automotive industry. In total, 187 participants, who were employees of the case organization, took part in the workshops. The common aim of the workshops was to create new and radical ideas that are supposed to enrich existing projects as well as to define new business undertakings in a new field for the case study organization. Since the workshop was designed to exhibit the research questions and to make sure that comparison is possible between the three playful interventions, the essence of the workshop concept was identical. In addition, we also conducted two control workshops with no playful intervention but regular idea generation methods such as brainwriting/brainstorming.

Concerning the general topic of emulating playful interventions into an idea generation workshop, the authors posed the research question: What are the effects of an integration of playful interventions in an idea generation workshop?

During the workshops, the following sub-questions were investigated:

- How is the impact of playful interventions on the quantity of ideas?

- How is the impact of playful interventions on the quality of ideas?

- How will an integration of playful interventions in the idea generation workshop affect the workshop experience?

This illustrative study provides new patterns, insights, and discloses research questions for the idea generation phases in the early stage of innovation processes in organizations. Data was collected through various methodological settings. The collection of data was conducted through questionnaires for participants, participatory observations of the researchers, and an independent expert rating, which was processed via a statistical approach using descriptive data analysis. While the number of ideas was gathered by merely comparing the final quantity of ideas, the quality of the ideas was determined by an overall mean rating of an independent expert group. For this purpose, the researchers adapted the frameworks of Dean, Hender, Rodgers, and

Santanen (2006) as well as of MacCrimmon and Wagner (1994) for exercising an idea quality rating. The practiced four dimensions for the rating of the ideas were novelty, workability, relevance, and thoroughness of the idea, rating ideas from 1 to 5, with 5 being the highest rating. To execute the third sub-question, whether or not the workshop experience of the participants of an idea generation workshop will be affected by practicing playful interventions, we established a questionnaire for the participants with three aspects. The three aspects were flow (Engeser and Tehinberg 2008), stimulation (Laugwitz et al. 2008) and dependability (ibid).

Consequently, a variety of different outcomes was observed: The number of ideas increased with two out of three playful interventions compared to the control group. Especially the gamified workshop had the best result of all workshops in terms of quantity of ideas. One of the most critical factors of an idea generation workshop is usually the quality of ideas. Two out of three workshops with a playful intervention as a method proved to have a subsequent significance on the quality of ideas. The workshops with the artistic and the toolkit-based modeling intervention achieved an outcome of high-quality ideas, which were rated by an independent group of experts to the corresponding topic. Surprisingly the good results of the quantity and quality of ideas were not an indicator for a high approve in the workshop experience of the participants. On the condition that we enforced a questionnaire with items concerning the flow, the stimulation, and the dependability of the workshop experience, we found out that the mean value of the accumulated workshop experience for the participants was the best during the control group workshop. In the authors' view, the emulation of playful interventions was successful concerning the ultimate goal of idea generation workshops, which is to develop a high quantity as well as novel and exceptional ideas for a specific issue. A theoretical contribution of this research can be seen in the conceptual emulation of playful interventions in idea generation workshops. The emphasis of this is that during the creation and stimulation phase of creativity, the integration of new and perhaps unconventional approaches are going to inspire the participants in order to adopt new thinking structures and experience unknown impulses. This helps them to create a higher number of ideas and evidentially high-quality ideas.

Keywords: artistic interventions, playfulness, idea generation, workshop, innovation

5. Sustainability Multidisciplinary

THE ROLE OF HR IN DEVELOPING PRO-ENVIRONMENTAL WORKPLACE BEHAVIOR FOR MUNICIPALITIES IN DURBAN, SOUTH AFRICA

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Innovation, creativity and now environmental sustainability, have become vital issues that is needed by organizations and government institutions for economic survival in this global age. In recent times, if you looked hard enough you will find at least one or two environmental or ecologically damaging issues such as, air/water pollution, over-population, energy depletion or nuclear power incidents, industrial pollution and climate change problems being faced by different countries, organizations across the world (Cheema and Javed, 2017). Oftentimes, private organizations, workplaces and even the public health are negatively impacted by these environmental challenges. These environmental challenges results into dire health problems for citizens and the public in general, unsustainable lifestyle due to poor standard of living and a deplorable socio-economy. Private organizations and governmental institutions ought to as a matter of urgency quickly take steps to curb or manage these problems that arose from the socio-environmental issues. In response, several empirical research had attempted to examine, discuss, explain and manage how green human resource management (GHRM) can be implemented across different organizations (private & public) and different sectors. As a result, multiple strategies or environmental management system have been proffered and developed by researchers, HR practitioners, experts, and corporate organizations to tackle these environmental issues some of which includes: promoting recycling, building sustainable cities and resources using natural or green materials, and adopting pro-environmental behaviours. The pervasive environmental degradation and unsustainable behaviours across a broad spectrum of nations is a pointer to the severity of the problem. Adoption of pro-environmental behaviours seems to be unpopular among managers of private and public organizations as opposed to other environmental management strategies. Where it is adopted, public or governmental institutions are lagging behind in the adoption. It is imperative for public institutions to adopt 'pro-environmental behaviours' or 'green culture' as an environmental management strategy. There is a need for municipalities to adopt and mainstream pro-environmental behaviours in their communities.
This study is therefore focused on how municipalities manage their environmental issues, and how the municipality's environmental management (EM) strategy impacts employees' behaviour and attitudes. The level of support from the management or directors of the municipalities determines either the success or failure of the EM strategy adopted. Government and by extension municipalities can become conduits pipes for implementing green environmental behaviour. Ex-

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tant research was focused on combatting climate change with physical structures and its subsequent adaptation by corporate and private organizations, very few research studies have focused on municipality's efforts at implementing GHRM to encourage employee green behaviours.

The study therefore employed a mixed-method design approach in order to understand the practicality of applying GHRM at the municipality. The need to understand how GHRM is implemented will inform on what is to be improved upon or removed from it. Moreover, mixed-method enables adequate understanding of employee's behaviour in a public service institution. Mixed-method approach implied the use of a questionnaires and interview schedule in order to interrogate which specific GHRM practice actually influence employees behaviour more, and which particular behaviour should the municipality management harp on. Questionnaire was self-administered to sixty-six middle level management HR staff of the municipality, while the interviews was conducted for eight HRM managerial staff (directors) and policy makers. Simple random convenience sampling was employed for the questionnaire administration, while the purposive sampling technique was used for selecting the managerial staff of the municipality. The choice of selecting HR employees was because the HR department manages the implementation of any 'organizational culture' in organizations, in this instance 'green behavioural culture' was the main goal. The choice of the selected municipality was aimed at understanding, how municipality manages its 'green behaviour culture' as opposed to private organizations that was prevalent with the GHRM sphere.

Data was collected and analysed through both descriptive and inferential statistical analysis. The study aimed to understand how managerial support influence workplace green behaviour at the municipality. The inferential statistics helped to test for the goodness of fit using the co-variance-based SEM for the derived conceptual model for the study.

The study found that the support of management influences green behaviour positively, in line with the study's objective. Managerial support is important and necessary for the successful adoption of 'green culture' or employee green behaviour for organizations. In addition, the study also found that any environmental sustainability initiative without the support of authorities or without the backing of management may survive initially but may likely not be successful in the long-run.
The focus of the study was on how municipalities manages 'green culture' for its employees. For adequate adoption of the green HRM / culture amongst employees, managerial support is needed and therefore recommended. It also recommends that further research investigate the extent of implementation and adoption of the 'green culture' among employees of organization.

Keywords: Green behaviour, Managerial support, Municipalities

Sustainability in Education: The case of Chemnitz University of Technology

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The United Nations (UN) acknowledges the importance of education as one of the key factors to change towards a sustainable society. Since 1992, Education for Sustainable Development (ESD) is promoted by the UN, starting with the Decade for ESD and followed by the Global Action Program. In order to establish ESD the present educational system has to be reviewed and changed. Since 1836, the Chemnitz University of Technology (CUT) is an institution for education in Saxony, Germany. Starting as a vocational school, it developed to an established institution for higher education. As an important organization to form generations of scientist and professionals, it has an obligation to offer excellent education, including up-to-date knowledge and competencies. As the significance of sustainable development (SD) for diverse fields has been rising over the last years, an analysis of the current status of embedment of the ESD in the CUTs higher education program is necessary and not available yet. The goal of our work is to examine the academic programs, institutes, schools and the education of the CUT to accomplish an overall picture of the current status of ESD. We want to answer the following research questions:

- What is the current state of Education for Sustainable Development at CUT? In what phase of sustainability education are the faculties of the university?
- What topics of ESD are embedded in the academic program?
- In context of these results, what are recommendations for further development of ESD at CUT?

To answer these question we use a new combination of two models. As a reference for better comparison with other institutes a Phase Model of Sustainability in Education, developed by Hart et al. (2017) is used. The model divides sustainability education in five different stages a program and school/faculty can reach. The stages are based on criteria concentrating on the curricula and the professorships which emphasize on sustainability-focused and -related topics. Phase 1 being the lowest, indicating no explicit integration of sustainability education. Phase 5 being the highest stage, indicating a concrete focus on sustainability education which is openly

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displayed. Originally, the model was designed exclusively for Master of Business Administration. Since our work is meant to explore the education of the whole CUT, which is specialized in a broad range of disciplines, the model will be adjusted by using the UNESCOs learning objectives for ESD (cognitive, socio-emotional and behavioral) as a reference and expansion of the model (UNESCO 2017). So, we have further indicators for the decision model of whether a course/module/professorship/etc. concerns sustainability-related topics. Reviewing the current research on topics of education for a sustainable society (Haan 2010; Wiek et al. 2011; Rieckmann 2012) the UNESCO identifies 8 key competencies for becoming an ASD: system thinking, anticipatory, normative, strategic, collaboration, critical thinking, self-awareness and integrated problem-solving. Learning objectives are meant to facilitate the competencies, by recommending teaching approaches and topics for each SDG. However, we accomplish only a cognitive overview. That means that only contents and theoretical implementations of ESD are subject of the examination, since the Phase Model by Hart et al. (2017) does not concentrate on a (holistic) competency approach.

For an analysis of CUT's study programs and faculties we use the Documentary Research Method (Bailey 2008, 293 ff.) and examine study documents, which include detailed descriptions of the modules. For a comprehensive review of the academic program, the websites of the study programs and the professorships are analyzed as well. This step was chosen, as the study documents sometimes lack information about professorship or descriptions of seminars. For choosing keywords for the analysis, we researched literature relating the topic of incorporating sustainability into curricula (Chau 2007; Etse and Ingley 2016; KNU 2018; Leal Filho 2018).

The study documents are examined by using a software for computer-assisted data analysis (MAXQDA) and using keywords to identify the relevant educational offerings. The output is reviewed to filter irrelevant matches and duplicates. The remaining tags have been explored further and clustered according to the phase model. Additionally, the list of courses within the study documents was evaluated manually to review if there might have been relevant courses which has been missed by the keyword selection. The content is either classified as sustainability-focused or sustainability-related. Courses which concentrate on Sustainable Development or Sustainability itself are sustainability-focused. If they concentrate on topics which are part of the UNESCO ESD learning objectives, but not necessarily under the view of sustainable development, they are classified as sustainability-related. The relevant data is clustered in: *Focus of the Programs/Schools, Courses, Program Specializations, Stand-alone Programs, Centers/Institutions* and *External Recognition.* Furthermore, the examination identifies which sustainability dimension (environmental, social, and economic) and UN SDG the data contributes to. As the study programs do not display external recognition in context of the phase model, two projects which concentrate on raising awareness for best practice in ESD are chosen: Netzwerk N (netzwerk n e.V.) and a networking tool by UNESCO with recommendations of good examples for ESD (UNESCO 2019). Additionally, any reference found at the website will be included and the course list of each professorship was reviewed manually, too.

The results show, that the faculties and programs are in different stages. The faculties concentrating on formal science (Mathematics and Computer Science) are in Phase 1. As these faculties focus is on non-empirical science and not on the description of the societal and world phenomena or the creation of presuppose knowledge of provisory facts, emphasize on SD within the education programs seems agreeable. However, as ESD is recommending a transdisciplinary and interdisciplinary approach, there could be scientific benefits of the integration of students from these faculties in research transdisciplinary research projects.

The faculty of Humanities is in Phase 2. Therefore, it has stand-alone courses with a focus on sustainability-related and focused topics. For the advancement to a higher stage of sus-

tainability education it could either dedicate an institute, chair, study program or at least a specialization within a study program towards relevant topics.

In Phase 3 are the Faculty of Mechanical Engineering, the Faculty of Electrical Engineering and Information Technology and the Faculty of Natural Science. The first two reached these phases by providing outstanding study programs concentrating on topics of ESD, the third by having an outstanding professorship. As technical focused faculties they include mainly topics of sustainable (energy) production and resource utilization. However, they integrate a small number of courses of other faculties in their study programs, which concentrate on non-technical driven topics like sustainable management. Still, an additional embedment of topics of social sustainability into the curricula of the study programs could benefit a more balanced view.

The last two faculties have been allocated in Phase 4. The Faculty of Economics and Business Administration and the Faculty of Humanities reached the highest phase among the CUTs faculties. They both offer study programs and professorship with a specialization in topics of SD. The study programs don't have outstanding study programs, but specialized programs. However, the professorship of Corporate Environmental Management and Sustainability (of the Faculty of Economics and Business Administration), is the only chair which is sustainability-focused. The other chairs that stand out, are just concentrating on sustainability-related topics.

The phase model indicates an overall good picture for ESD at the university, as the university has faculties almost evenly distributed and study programs in all phases, except Phase 5. The lack of external recognition of the faculties or study programs for ESD prevented an allocation to Phase 5: Leading. Therefore, the CUT cannot be described as a leader in ESD. External recognition might lead to funding and a rise in overall awareness for SD and ESD, which can be a barrier for implementation if not available (Velazquez et al. 2005, 85 ff.). Additionally, these two factors can function as a promoter and help to overcome resistance to change and to convince decision makers. Therefor it would be beneficial to gain external recognition. First steps to reach higher external recognition are undertook by the Faculty of Economics and Business Administration by signing up to the United Nations-supported initiative PRME (Principles for Responsible Management Education) and by starting a workgroup for a university wide sustainability reporting.

Further results of our research relate to the consideration of the three dimensions of sustainability in the courses and the distribution of the SDG codes.
Generally, it can be said, that for a better integration of sustainability related topics, it is recommendable to integrate especially the educational content of the chairs with emphasis in sustainability within the academic program. Additionally, the existing courses can build a great foundation for a pool of courses which can be included in programs which strive towards ESD. As many study programs offer optional courses, less have mandatory courses with sustainability-focused or -related topics. For an overall better focus on ESD the obligatory part of the study programs should include more of the stand out courses. This can be facilitated by the creation of guidelines and standardized processes, as well as the adaption of already existing documents and processes to assure a deep structural foundation.

Keywords: sustainability, education, Chemnitz University of Technology, Sustainable Development Goals, education for sustainable development, phase model of sustainability in education

Implementation of the Sustainable Development Goals in a Non-Governmental Organization

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Our planet is facing drastic environmental, social, and economic challenges. Topics like poverty, hunger crisis, global warming, pollution, and water scarcity affect most of the earth's population either directly or indirectly. The impact of these problems not only affects the present generation, but also future ones. High hopes are placed in the concept of sustainable development to address these environmental, social, and economic challenges. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED 1987). In 2015, the United Nations passed the Agenda 2030 to address these challenges collectively at a global level through sustainable development. The agenda contains a great deal of globally valid priorities and goals, which are planned to be implemented and achieved by 2030. As part of Agenda 2030, the Sustainable Development Goals (SDGs) were adopted by all member states in September 2015. "The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice." (United Nations 2019). In order to prioritize and enable measurability, the SDGs set 17 goals to promote sustainable development.

To support companies in sustainable business the SDG Compass has been drafted. "The SDG Compass provides guidance for companies on how they can align their strategies as well as measure and manage their contribution to the realization of the SDGs." (United Nations, GRI & wbcsd. 2016). Within the SDG Compass, tools and design options are presented, which support the implementation of sustainability in business strategies in five steps (understanding the SDGs, defining priorities, setting goals, integrating, and reporting and communicating). In addition, instruments are recommended which should help to plan, control, and measure the business activities.

However, the SDG Compass was developed for private businesses and is not geared to the specifics of a Non-Governmental Organization (NGO). Compared to private enterprise companies, NGOs face different challenges, needs and problems. "[...] NGOs are formal (professionalized) independent societal organizations whose primary aim is to promote common goals at the national or the international level." (Martens 2002, p. 282). Therefore, while private enterprise companies focus usually on business goals and growth, NGOs focus on the common good and do

*Speaker

not pursue profit-driven goals. However, NGOs play an important role in achieving sustainable development. "They will play a crucial part in putting the world onto sustainable development paths, in laying the groundwork for Our Common Future." (WCED 1987). Therefore, they should also be provided with a guide to help them prioritize and implement sustainable actions, but currently, there is no adapted framework or guide for NGOs, which is directly aligned to the implementation of the SDGs in their organisations strategies. This leads us to our research questions:

- Which specific needs exist in a Non-Governmental Organization relating to the implementation of the Sustainable Development Goals?
- Which adjustment requirements are needed to match the SDG Compass to these specific needs?

To answer these questions we want to research the case of a humanitarian NGO. To examine the connection between NGOs, SDGs, and their evaluation/ implementation, a literature review is conducted, using the databases of EBSCO, Google Scholar, Karlsruher Virtueller Katalog, ScienceDirect, Scopus, and Web of Science. Based on the results of the literature review we are planning expert interviews with a qualitative content analysis (Gläser and Laudel 2010) and optionally workshops to evaluate the topic of the implementation of the SDGs in NGOs and to assess the adjustment requirements of the SDG Compass, using the example of our NGO partner. Units of analysis are in general the specific needs of a NGO relating to the implementation of the SDGs and in specific the understanding of the SDGs (and concluding responsibilities), definition of priorities and identification of indicators, setting goals and selecting key performance indicators, integration of the SDGs within the organization, and reporting and communicating to stakeholders.

The research project is planned until December 2019.We expect as a result along with recommendations for guidance, a SDG Compass, which is adapted to the specific requirements of NGO's. Furthermore, the case of our NGO partner can provide a blueprint for implementing the SDGs in NGOs.

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Keywords: Sustainable Development Goals, Non Governmental Organization, SDG Compass, sustainability, evaluation

Sustainability self-assessment questionnaires of component suppliers along the value chain – a waste of time or progress towards sustainability?

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Sustainability self-assessment questionnaires of component suppliers along the value chain – a waste of time or progress towards sustainability?
What is the problem?

The automotive industry is characterized by complex value chains and networks as well as deep structured supplier bases. In 2014 the automotive OEMs launched a joint sustainability self-assessment for suppliers in order to assess the sustainability performance of suppliers in the automotive sector. The main areas of the self-assessment comprise the supplier performance on sustainability issues, like CSR, environmental matters, sustainability engagement in supplier management, business conduct and compliance, etc. The main goal was to avoid duplication and increase efficiency for both, the OEMs and their suppliers.

According to Hacking and Guthrie (2008) sustainability assessment can be embedded in impact assessment practices designing a framework focusing on strategicness (level of accentuating strategy), comprehensiveness (direct and indirect effects of sustainability issues, e.g. dimensions concerning triple-bottom-line, strategies (sufficiency, consistency, efficiency) principles, etc.), and integratedness (the way assessment techniques are used, combined and aligned). Schulte and Hallstedt (2018: 13) compiled the criteria most important for creating industrial value in light of self-assessment: "(i) be applicable by companies without external help; (ii) generate results that have a good balance between being general and concrete; (iii) be applied with reasonable time and resources; (iv) measure the level of current capabilities for sustainability implementation; (v) handle the subjectivity of the self-assessments in a way that minimizes the bias in the results and at the same time does not require too many resources; (vi) be applicable to build a roadmap for systematic improvement; and, (vii) be supportive as a communication tool at the same time as being able to measure the progress".

Why is it important?

*Speaker

The automotive industry is engaging in sustainability, but mainly using a very own understanding of sustainability. However, sustainability is not arbitrary, but follows clear vision, strategies, principles, criteria and indicators. So, it is of interest how the self-assessment questionnaires (SAQ) reflect sustainability effectively and progressively. In addition, it is rather unclear if self-assessment questionnaires really reflect the suppliers performance on CSR, sustainability, etc.. Moreover, it is of interest if the SAQ really improve sustainability progress or rather cause contra-productivity in an organizational and value chain sense. The main importance is to be seen in the fact that automotive OEMs might have own understandings and implementations or realization strategies towards sustainability. If so, self-assessment might mainly be a tool for backstop than advancing real sustainability progress. Final, the benefit to other members of the organization or the organization as a whole or along the value chain is not fully identified.

What did you do?

We analyzed SAQs, two German and six English ones, in order to understand the main foci of the questionnaires. In addition, we analyzed the concepts of the SAQs by using Leximancer software, and analyzed deviation from GRI reporting for better understanding of sustainability progress. Moreover, interviews were conducted with components suppliers in order to understand the usefulness of the SAQs.

What did you find?

Using Leximancer software, we did find that self-assessment questionnaires reflect main sustainability and CSR issues, e.g. company, management and service issues, working conditions, etc. However, they strongly relate to GRI standards and often duplicate indicators.

Per questionnaire approx. 4-5 hours must be estimated, including the assembly of the information and the upload of the desired documents. This does not take into account the integration into the database structure of the questionnaires - it must be added the first time. It should be noted that these questionnaires must be completed for each individual location, including field offices without actual production. Completing these questionnaires approx. 1 to 2 hours are needed. In some cases, however, license fees for participation are added (e.g. ecoVadis). Since suppliers in the automotive industry are usually forced to set up and maintain an environmental, occupational safety, health and energy management system in addition to quality management, anyway, actual added value remains largely hidden. The questionnaires are intended to ensure this. This is also a legitimate purpose. However, the SAQs tend to act as a safeguard for the OEMs, without initiating any concrete progress towards sustainability. Real innovations in the sense of sustainability are not a component. These are created with development suppliers if necessary, so that clear guidelines are given, e.g. to use certain materials. However, not all of the given innovations are really progress towards sustainability.

The SAQs do more relate to quality assurance questions and standardized management systems than to subjects related to self-assessment. The SAQs are indeed capacity-absorbing, thus, lost productivity is very likely. An establishment of a risk management that helps supporting sustainability criteria or standards is not addressed and directly supported. In addition, the self-assessments often do not address real progress and ideas to move towards sustainability or improve products, processes or innovations more sustainably. The concept maps also show that innovations is not addressed. One interpretation is that sustainability progress in terms of innovation is not wanted. Therefore, several reasons might be discussed: The specifications of products are clearly given, and mass-production leaves no room for adjustments.

Concerning the seven criteria compiled by Schulte and Hallstedt (2018) we found in line with

the following evaluation excellent – good – fair – inappropriate – bad:

- applicability by companies without external help: fair
- results having a good balance (between being general and concrete): fair
- effective in time and resources: bad
- measuring the level of current capabilities for sustainability implementation: fair
- minimizing the bias in the results while saving resources: inappropriate
- building a roadmap for systematic improvements: fair
- applicability as a communication tool at while measuring the progress: inappropriate

What do you recommend?

Either these SAQs should be reframed or renamed or they should be more aligned to self-assessment requirements, so the companies really can contribute to sustainability progress. So, SAQs in the automotive sector should also address innovation possibilities and clear progress towards sustainability in order to improve the whole value chain and make it more sustainably. Schulte and Hallstedt (2018) recommend eight key elements a self-assessment should contain: 1: Ensure organizational support from senior management to integrate sustainability, 2: Sustainability perspective early in the product innovation process, 3: Utilize knowledge and experience of procurement staff in the earliest phases of the process, 4: Consideration of social aspects across the product life-cycle and its value chain, 5: Assigned responsibilities for sustainability implementation in the product innovation process, 6: A systematic way of competence building, 7: Utilize tools for guiding decisions in product development, 8: Utilize tools that incorporate a backcasting perspective from a definition of success.

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Keywords: sustainability progress, self, assessment questionnaires, component suppliers, value chain

Moving towards circular economy in a socially sustainable way in the fashion industry - comparing corporate, academic and stakeholder concepts identified by means of Leximancer(TM)

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Moving towards circular economy in a socially sustainable way in the fashion industry - comparing corporate, academic and stakeholder concepts identified by means of Leximancer(TM)

Extended abstract

What is the problem?

"The idea of a sustainable development stresses the creation of resilient ecological, social and economic systems by respecting the natural and given limits of ecological viability and capacity" (Arnold 2018, p. 582). As second largest sector across the world, the fashion industry has been faced repeatedly with scandals and accusations in terms of environmental and social burdens due to long-prevailing linear production and consumption patterns of 'make-take-dispose'. Economic pressures and rising general public awareness, however, have been accompanying strategies to reshape business models and to foster transitions towards sustainability. One of the most advocated approaches in recent years is the concept of a circular economy which is considered to aim at creating a restorative and ecological economy. It includes aspects such as closing loops, decoupling of economic wealth creation from natural resource consumption, designing out waste as well as shifting towards environmental and long-term resilience (e.g., Nußholz 2018; Ranta et al., 2018; De Angelis et al., 2018; Hopkinson et al., 2018; Lahti et al., 2018; Oghazi and Mostaghel, 2018; Prieto-Sandoval et al., 2018; Merli et al., 2018; Tura et al., 2019; Levänen et al., 2018). Furthermore, the concept of a circular economy is considered to providing benefits for society (Korhonen et al., 2018). However, research on what aspects of a circular economy are actually essential for society and which could be potentially significant is scarce (Moreau et al., 2017). This particularly proves true for research on the integration of the concept in the global fashion industry.

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Why is it important?

Rising pressure for (social) compliance (Sinkovics et al. 2016) has been forcing fast fashion retailers to newly develop or align their CSR policies (Caro and Martínez-de-Albéniz 2014). Increasing demands for socially responsible business operations and inducing systemic changes also extend to altering prevailing production and consumption patterns in the fashion industry (Hirscher et al. 2018; Austgulen 2016). Yet, such profound changes are likely to require more radical, non-technological innovations as highlighted in recent research by Bidmon and Knab (2018). The little consideration of social aspects in a circular economy has been repeatedly criticized (e.g., Moreau et al. 2017). In fact, potentials for including social sustainability in the concept involve aspects such as deeper changes of social values underlying the economic system and activity, thereby promoting non-ownership, low consumerism, social awareness, sense of community, cooperation and participation as well as increasing labor-intensive activities based on diverse and dignified work activities (Lieder and Rashid 2016; Korhonen et al. 2018; Moreau et al. 2017). Moreover, as circular economy concepts mainly focus on environmental, technical and economic issues and social issues are underrepresented, the main questions are how social sustainability is embraced in circular concepts, and how both are embedded in the fashion industry.

What did you do?

Drawing upon this shortcoming, the present study examines the integration of social sustainability-related aspects in corporate sustainability reports of the fashion companies C&A and H&M. It contrasts them with publications of scholars and stakeholders about sustainable and circular fashion between 2014 and 2018 by applying the software-based content analysis tool Leximancer(TM). We analyzed similarities and differences by comparing concepts of social sustainability and circular economy in corporate, academic and stakeholder publications.

What did you find?

The results delineate specific themes and concepts related to social sustainability in the fashion industry by comparatively assessing publications from the business, academic and wider public spheres. In doing so, the analysis reveals similarities and differences between various temporal and thematic courses of development among single players related to the fashion industry. The manifestation and integration of social aspects are identified and analyzed for each party to assess their trajectories of development towards more sustainability and circularity in the fashion industry. Our findings show that fashion companies have gradually been communicating more about social sustainability-related aspects opposed to academic and stakeholder publications. Furthermore, while single social sustainability-related aspects exclusively appear in each of the publication groups analyzed, others seem to reflect a mutual influence among the three parties involved. Yet, the results also show that a great number of social sustainability-related issues cannot be found in any of the publications, thereby corroborating extant views that call for a greater elaboration on social aspects in the conceptualization of a circular economy. Overall, based on a fine-graining of socially relevant concepts this analysis contributes to research on the social dimension of the circular economy in the fashion industry.

What do you recommend?

There remains a considerable amount of aspects and themes relating to social sustainability

that do not occur in any of the concept maps among the three groups examined. What is even more, up to now, these aspects seem to be only marginally addressed in scholarly publications on circular fashion business models, leaving thus space for further conceptual and theoretical research as well as practical realization.

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Keywords: Circular economy, Social sustainability, Fashion industry, Leximancer(TM)

The North-South Divide in Business Leaders' Moral Sentiment: A Problem for Global Sustainability?

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What is the problem?

There is a divide between North and South regions of the globe regarding the ethical priorities of what the correct balance should be between ecocentric versus anthropocentric orientations towards sustainability among business leaders. In the North, which is defined broadly in this paper as the developed world, there has been an almost apocalyptic realization that climatically speaking, time is running out and if drastic and protracted action is not taken to curb global warming, the probability of the ultimate extinction of humanity is reinforced. Thus, the recent appearance of the 'Extinction Rebellion' and other pressure groups towards ecological conservation.

In the South, defined broadly as the developing world, the socio-economic drive towards ecocentric behavior (defined as socio-economic and political behavior strongly oriented towards ecological conservation) has not been as evident or as pronounced. India and Africa in particular, continue to have vast swathes of their respective populations living in poverty and the need in these countries has been more anthropocentrically oriented (defined as socio-economic and political behavior aimed at providing for human needs).

Thus, a North-South divide exists in terms of the correct balance between socio-economic and political behavior that emphasizes ecocentric, environmentally conservationist policies over anthropocentric policies that favor economic growth and the provision of basic human needs, whether they are environmentally friendly or not. However, in addition to the North- South ecocentric/anthropocentric divide, there are key differences in moral values. The North, broadly speaking being more individualistic in orientation and the South, particularly Africa, being more communalistic in orientation (Hofstede,2001)

In a sense, the North has already enjoyed the opportunity to industrialize and use natural nonrenewable resources to build up the basis for their economic pre-eminence in the world and is now perhaps a little hypocritically, calling on the South to take care of their ecological and environmental resources before satisfying the basic needs of their poverty-stricken populations.

The paper uses as a theoretical model, Adam Smith's Theory of Moral Sentiment to describe and explain how cultural factors impinge on our moral values and sentiment and the ways certain aspects of our world are considered morally more important than others. The paper uses

*Speaker

secondary data from an empirical case study to highlight differences of moral sentiment between the North and the South and analyses these aspects with the use of an exploratory model of ecocentric and anthropocentric orientations and their likely effect on gaining global consensus among business leaders on sustainability.

Why is it important?
The difference in moral sentiment and related ecocentric vis a vis anthropocentric socio-economic and political behaviors, has a pronounce bearing on what sustainability means and how it is likely to be implemented. The North-South divide in priorities and moral sentiment is likely to make full-hearted global consensus on the environmental emphasis and purportedly necessary to curb humanity's inexorable impetus toward ultimate extinction, unlikely to be achieved. A balanced accommodative approach is required to ensure that sustainability policies are appropriate and tailor-made to meet the extant contingencies of impoverished populations in the developing world.

What did I do?
The study uses secondary data analysis as its methodological approach and reports on a recent case study that compares cross-cultural (North-South) future business leaders' moral sentiment empirically using Adam Smith's theoretical model. The case study and other sources of secondary data are used to build an exploratory ecocentric-anthropocentric model which describes theoretical possibilities of sustainability implementation and their appropriateness given the differences in moral sentiment and national priorities.

Adam Smith (1976) argues that there are "natural" rights and wrongs in moral sentiment that can be amplified or deadened through their consistency with nature and human society's survival. Behind differences in moral sentiment based on custom, there are general "natural" human ideas of right and wrong. Smith (1976) maintains that custom and fashion influence moral sympathy, but also recognizes that at the extreme ends of an imaginary moral disapprobation–approbation continuum, there exists a moral consensus. The way 'custom' or culture affect moral sentiment and the emphasis different culturally- based moral sentiment puts on anthropocentric vis a vis ecocentric orientations differs between the North and the South. This difference has a direct bearing on what sustainable socio-economic and political behavior can realistically encompass in the South given its anthropocentric developmental priorities.

What did you find?

" Adam Smith's Theory of Moral Sentiments mechanism of moral judgement based on common sense and enabling a disinterested and dispassionate evaluation of the motives and actions of ourselves and others. It does this through foresight to compare one situation in the context of others and in terms of moral rules and what society should approve" (Werhane 1991, p. 38). The quotation acknowledges the propensity for cultural bases regarding moral rules and affirms that the judgment of moral conduct should be that of an 'impartial spectator' who weighs up moral conduct in terms of specific existing societal customs. To demonstrate this a qualitative empirical case study (Coldwell, 2015) of German and South African postgraduate students under training for particular Management professions who came from and represented, broadly speaking, the North -South cultural divide and the different cultural customs of their respective

backgrounds is reported in the paper.

Very briefly, the study empirically analyzed Smith's theory using a specifically devised heuristic model, by investigating German and South African student moral sentiments towards specific ethical leadership behaviors. The study found, in line with Adam Smith's theory, that although there was general cross-cultural consensus in what constitutes moral approbation regarding fundamental aspects of ethical leadership behavior, culturally based, nuanced differences emerge in the qualitative analysis. Specifically the study found that although the ethicality of specific leadership behavior was found to be viewed similarly by both groups of students, significant differences arose among the German students who emphasized the moral autonomy of the leader in making ethical decisions rather than the "collective concern" moral orientation favored by their South African counterparts. This difference in moral sentiment corresponds broadly to the individualist orientation of the North and the communalistic orientation of the South (Hofstede,2001), The divide in moral sentiment found in this empirical study is discussed in terms of an exploratory model of ecocentric versus anthropocentric socio-economic and political behavior emphasis appropriate and indeed realistically viable in the South and its bearing on global sustainability.

What do you recommend?

The secondary data analysis indicates that the content and implementation of sustainability by business leaders needs to be aware and take account of North- South differences in moral sentiment and national socio-economic priorities to be effective. The drive for sustainability that has reached a point of near hysteria in the North has to be tempered with anthropocentric urgency to lift the populations of the developing world out of poverty. To be effective and acceptable globally sustainable behavior has to accommodate the genuine needs, priorities and aspirations of the developing world, otherwise it is likely to be thrown out in short measure in much the same way as the noble but naïve extinction rebellion member was forcibly removed from the roof of a commuter train in London by irate largely working class commuters wanting to get to work to earn a living.

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Keywords: anthropocentric, ecocentric, moral sentiment, sustainability, North, South

Materiality matrix : a sustainability tool for risks and opportunities

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In the era of globalization, the questioning of the different types of corporate responsibilities and the nature of their contributions to society has become unavoidable and it seems irrational to think that companies are not connected with the society itself (Gond and Igalens, 2016). They are confronted with very disparate social, ethical, political and religious contexts (Tilt, 2016). Thus, there is a growing body of pressure around organizations that forces them to adopt a socially responsible behavior (Déjean and Gond, 2004).
The topic of Corporate Social Responsibility (CSR) is clearly highlighted and remains on an upward and sustainable trajectory (Carroll and Brown, 2018).

As part of their CSR policy, companies publish non-financial information (legal obligation Article 225 of the Grenelle 2 law and Ordinance No. 2017-1180 of 19 July 2017), for which the International Integrated Reporting Council (IIRC) and the Global Reporting Initiative (GRI) recommend an upstream "materiality analysis" as this is a key phase in companies' integrated reports (Ortar, 2016). This analysis is a strategic tool, ranking the CSR relevant topics that have an impact on the company's business model (Baumüller et al., 2018).

GRI G4 (2016) provides some recommendations in its standard but in the form of guidelines and not detailed methodology, for example impact assessment remains very generalist. In 2016, 32 CAC 40 companies presented a materiality analysis in their report (ORSE, 2017), however the methodology to really understand how to carry out this analysis, and formalize it through the materiality matrices, is still unclear and rare (Utopies, 2014). Finally, academic publications on this subject are also scarce.

The objective of this study is therefore to seek to understand: In what way, dyadic issues in the materiality matrix tool, in different institutional contexts, can contribute to business strategy.

We have formulated the following research questions that will then determine the methodology to be used (Gavard-Perret, 2012):

- How to define a methodology for developing materiality matrices to formalize the dialogue with all stakeholders?

*Speaker

- How to shematize the aspect of stakeholder dynamics according to their weight, importance and the evolution of their expectations and perceptions?
- How are the sources of risks and opportunities for companies identified through the so-called material topics?

Our study aims to:

- On the theoretical level, in particular with reference to Clarkson's (1995) texts for the identification of primary and secondary stakeholders and Mitchell et al's (1997) typology with a classification according to urgency, legitimacy and power. Indeed, in relation to materiality, those stakeholder hierarchies may not go far enough because they do not ultimately make it possible to graphically weight stakeholders' relevant topics. So I wish to complete those theories through a complementary classification ;
- On the empirical level, to produce a clear methodology for developing CSR materiality matrices in a cooperative banking context ;
- To enrich the field of materiality, because to date there is no thesis in progress in France and although 80% of CAC 40 companies publish their materiality matrix (ORSE, 2017), few academic studies on those matrices have been published.

Theorical Framework

The environment poses technical, economic and physical as well as social, cultural, legal or political requirements (Hatch and Cunliffe, 2009) as well as institutional pressures (Brammer et al., 2012). We have focused on the conceptual framework of neo-institutional theory, which is characterized by its sociological character (DiMaggio and Powell, 1997). Those authors presented the different coercive, normative or mimetic processes through which value systems and cultural frameworks in a given environment are assimilated by organizations.

It therefore allows us to analyse how companies are influenced by institutionalised rules, environments (Desreumaux, 2017) but also by "concrete and active social relations systems" (Rizza, 2008). This approach includes culturalist analysis, but above all it goes beyond it, taking into account the economic and social phenomena in their entirety. Because of the different institutional contexts and therefore the behaviours of individuals and organizations, this theory grasps the notion of " embeddedness " as evoked by Zukin and DiMaggio (1990), which responds to our research context.

Literature review

Gond and Mercier (2005) define stakeholders as the company's relationships with its entire environment. Some stakeholders are at the same time employees and members, customers and members, ... We speak of ubiquity of stakeholders because they may be confronted with divergent interests (Mercier, 2010). The model of Mitchell et al (1997) allows us to focus on the

so-called "salient" stakeholders, according to a managerial perception. We can thus establish a typology of stakeholders according to 3 attributes : power, legitimacy, and urgency.

This typology leads to a hierarchy of expectations and guides the organization's priorities according to the degree of importance it attaches to a stakeholder.

However, their sensitivities to certain current societal topics, are not identified through this model. This is how tools such as materiality matrices have emerged.

According to AA 1000 (2008), materiality "determines the relevance and scope of an issue for an organization and its stakeholders". This concept of materiality has its origins in the financial world (Rhouma and Scotto, 2011), whose purpose is to isolate the important financial elements that describe a company's economic performance (Dohr, 1950; Bernstein, 1967).

Materiality matrices are management tools in the sense that Chiapello and Gilbert (2013) define them as "a delimited set of organizational objects with characteristic features that can be described in three ways: functional, structural and procedural". They also have an organizational function within companies that allows them to plan, decide, evaluate and control (Grimand, 2016). Those authors also stress the relevance of "building research" based on managerial tools, as one of their functions may be to reduce the potentially arbitrary decisions of managers and executives in organizations. Companies, which can be subject to strong antagonistic pressures, are sometimes held accountable because their discourse is "decoupled" from their practices (Dumez et al., 2013). Thus, identifying the expectations of stakeholders in advance of the phase, and formalizing them through those matrices, would place companies in a more proactive than curative role by highlighting risks and opportunities for them.

Empirical research

Our study is conducted within " Banque Populaire Alsace Lorraine Champagne " (BPALC), which has 19 administrators, 2657 employees, 860,843 customers, 339,473 members and 250 retail agences (Annual Report, 2018).

It can be seen that the BPALC operates in a territorial sphere with many varied stakeholders whose numerical weight is also not uniform.

As a cooperative bank, BPALC has homogeneous interests and expectations (Girard and Sobczak, 2012) and its status naturally leads to the development of a particular mode of governance, obeying more partnership than shareholder logic (Richez-Battesti et al., 2006).

The territorial context of our research places us in a situation with multiple embeddings and so-called heterogeneous environments (Capron and Quairel-Lanoizelée, 2010) that we must take into account.

Designing specific approaches to CSR for each entity in which they are present (Arthaud-Day, 2005) is essential. Because of the territorial location of the BPALC, in this local dimension, the "strategic summit" of an organization, i.e. its leaders, serves the needs of "those who control or have power over the organization" (Mintzberg and Gosling, 2002). The latter can therefore contribute to the process of operationalizing CSR by formalising action plans and coordinating

the organisation's activities in line with the expectations of its stakeholders (Rasalofo-Distler, 2010), e.g. via the materiality matrices.

In a company, there are different strategies: Marketing, Finance, Human Ressources, ... Strategy is a "major political issue since, on its behalf, specialized groups in the company take power, eliminating other perspectives" (Hafsi and Martinet, 2007). While materiality matrices are a management tool that can potentially serve the strategy of organizations, understanding how those new strategic tools are designed and developed is a necessity (Whittington, 2004).

Methodology

Our ambition is to define a methodology for developing those matrices by constructing the BPALC methodology and academically analysing each process. It should be recalled that the design and implementation of management tools provides knowledge for both action and theory (David et al., 2012).

To do this we have developed a step-by-step synoptic

In order to interview all BPALC stakeholders, we have access to the Sphinx application and all customer files.To date, we are still in the data collection phase.

For the likert scale survey, in order to obtain sufficient response rates and good response qualities, we are working with BPALC to consider the possibilities of incentives, "material or immaterial benefits following participation in the respondent survey" (Frippiat and Marquis, 2010).

Epistemological posture

From the point of view of our epistemological posture, the pragmatic perspective of this project has impacts. By developing a methodology we position ourselves in an engineering constructivist approach since "the object crystallizes the theoretical concerns of the researcher and responds to the practical problems of the members of the organization studied" (Thiétart, 2014).

The fact of elaborating the materiality matrix for the BPALC places us in a "co-construction" position as defined by Allard-Poesi and Perret (2003).So we are in the context of what is called intervention research as it is presented, among others by David (2000).

Keywords: CSR, Materiality Matrix, Relevant Sustainability topics, Riks & Opportunity

Tiny Houses as innovations for social inequalities and poverty in Germany?

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Problem and justification of research interest
In Germany, there is an increasing housing shortage, especially in large cities such as Berlin or Hamburg. Among other things, this is leading to an increased number of homeless people in Germany and the problem of social inequalities. As an alternative form of housing, Tiny Houses have the potential to reduce these social inequalities by offering shelter to homeless people or by providing an affordable alternative for people on low incomes. The Tiny House Movement has become a trend in Germany within a short period of time and continues to progress. Current challenges of previous implementations are mainly due to legal barriers that cannot yet be overcome nationwide. Above all, there is a lack of scientific debate on these aspects and a systematic exchange between all relevant stakeholders. The aim of the study is to examine whether Tiny Houses can be made useful as innovations for markets characterized by poverty and social exclusion. In expert interviews with various stakeholders, deductively derived principles for innovations in these markets will be analyzed. The aim is to find out whether these innovation principles can be fulfilled and how they can be implemented. It turns out that a large number of the principles can be transferred to the Tiny House Movement in Germany, while others play no or subordinate role. The municipalities in particular need to pay attention to the potential of Tiny Houses in order to create legal, lasting and sustainable alternatives from the short-term solutions that have been available so far. Thus, Tiny Houses could potentially provide an optimal breeding ground for combating inequalities in Germany.

Background

Combating inequalities and poverty

One of the 17 Sustainable Development Goals is the reduction of inequalities in and among individual countries. The gap between rich and poor not only exists among different countries, but is also becoming increasingly apparent within single, even apparently rich, countries. Germany has a far-reaching social system and is one of the richest countries in the world. However, almost 20% of people are affected by social exclusion or poverty (Statista, 2018).

At the global level, around 8% of the population live in extreme poverty, not even $2 a day (World Data Lab, 2018). They are therefore considered poor. However, the concept of poverty can be extended and it is recommended to define poverty in a different way (Finkenwirth and Diemand, 2017). Accordingly, some economists propose to include purchasing power and thus price differences depending on the place of residence (ibid.). An alternative approach to the def-

*Speaker

inition of poverty could be essential, especially in the context of richer countries like Germany. Compared to the usual understanding of poverty, poor people in wealthy countries like Germany are usually still able to satisfy their basic needs. However, they often lack resources. Problems of social exclusion and imbalance also play a role. Relative poverty (World Vision Institute, 2018), in particular, does not play an insignificant role within affluent countries. The focus here is on a shortage of goods, both material and immaterial, and a simultaneous restriction of life chances. Relevant is the comparison with the prosperity of the respective society under consideration. Relative poverty is defined as a situation in which a person has far less to live for than the majority of the society surveyed (World Vision Institute, 2018).

It is estimated that more than one million people in Germany live without a permanent home by 2018 (Nehls, 2018). Against the background of rising rents, especially in large cities, it is to be expected that fewer people will be able to afford "decent" housing in the future (Reuter, 2017; BAG Wohnungslosenhilfe e.V., 2018). In order to meet the actual key objective of combating inequalities, this problem for society as a whole must be addressed in several dimensions. Soederberg (2018) points out that the challenges of low-income rented housing, such as over-indebtedness, forced evictions and potential homelessness, have been insufficiently addressed at both an analytical and historical level so far. In Germany it is often assumed that people do not have to live as homeless because they are absorbed by the social system. But the housing shortage in Germany has been increasing for years (Reuter, 2017). Accordingly, it is necessary to recognize the problem and find appropriate solutions, not to leave people to themselves and, at best, to reintegrate them into society.

Therefore, alternative living concepts such as the Tiny House Movement and specific applications can be one of many other options. It's important to mention that Tiny Houses should not be understood as a fashion trend or universal solution, but rather offer new possibilities for the problems mentioned and are to be seen in co-existence with alternative new forms of housing.

Tiny House Movement

In recent years a movement has emerged under the name "Tiny House Movement" or "small house movement" (Anson, 2014, p. 292). It originates in connection with catchwords such as *clearing out*, *reduction* or *minimization* in the 19th century and is also supported in the 20th century by the credo "less is more" (Ford & Gomez-Lanier, 2017, p. 394). At present, there is no uniform definition of how large a "Tiny House" must be to fall under this designation. Predominantly in the literature, these are dimensions of less than 37 square meters (Evans, 2017; Tiny Houses Consulting UG, 2018). In addition to the size dimensions, Tiny Houses are also differentiated into versions on rolls and fixed houses.

Its small size volume is often associated with specific sustainability aspects like lower resource consumption (for manufacturing) and lower costs. Thus, Wyatt (2018) emphasizes some potential benefits of Tiny Houses for the following topics: economy, sustainability (focus on resources such as material and floor space), community or retreat, choice (due to the expansion of housing), simplicity, self-sufficiency, mobility, property potential, personalization. It can be said that Tiny Houses, due to their smaller size, have the potential to be less expensive than standard single-family houses, which means they can bring some economic benefits, such as lower housing costs and at the same time more money for living (Anson, 2014). In many cases, building materials are aimed at ecologically sustainable aspects, and some suppliers strive for energy-efficient solutions (e.g. carpentry Dreamwood, GOTINY, WW Wohnwagon). Additionally, Tiny Houses can bring advantages from the perspective of social sustainability, whereby the community idea can play a crucial role here. For example, Pope (2018) shows how community-based learning can serve as a tool for building Tiny Houses for the homeless. In Germany they are also already

being used as a tool to help refugees enter the labor market. The fundraising project KUNA allows refugees to build individual houses and thus gives them access to existing networks, the German work culture and support in finding a job (Watling, 2018).

Despite their specific legal hurdles Tiny Houses already exist in the USA for the homeless as a temporary housing option and even for long-term living (Green, 2016). Examples of such Tiny House Villages are Eugene's Collaborative Village or Portland's Autonomous Village (Heben, 2014). The question arises whether this would also be feasible for Germany. Here as well as in Austria there already exist projects, which are mainly dependent on donations and aim to make Tiny Houses usable as an innovative concept and to provide shelter for the homeless.
A central implementation has so far failed and is particularly evident in the demolition of individual buildings (Fröhlich, 2019). But, according to TAZ (2019), the establishment of Tiny Houses in both the Senate and districts of Berlin is being discussed as a complementary option for dealing with homelessness. Topics such as suitable location options as well as psychological and social support are therefore highly relevant (TAZ, 2019).

Keywords: social inequalities, poverty, tiny house movement, innovation

Reflections on the Overlaps between Corporate Social Responsibility and Sustainability: A Review of Literature

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ABSTRACT

Organisations in the 21st century are becoming more aware of their environmental, social and economic footprint and how their products/services influence these three environments. Sustainability of an organisation is not just about its products and services, but also refers to how the organisation moves towards sustaining itself through new products and services offerings and being profitable, without negatively impacting on the environment in which the

organisation functions. Both Corporate Social Responsibility and Sustainability have become popular concepts within the business world and in many instances have been used interchangeably. According to the World Business Council For Sustainability Development, Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large On its part, Sustainability is concerned with the effect of human action in the present and its impact on the options available for future generations. Sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. This paper aims at making an exposition of both these concepts, reflecting on the overlaps between them. To achieve this objective, literature on these two concepts has been reviewed. The findings from the review revealed that there is a thin line of distinction between the two concepts, this resulting in the concepts being confused with each other and in many instances used interchangeably.

Key Words: *Corporate Social Responsibility; Sustainability; Products/Services; Community; Future Generations.*

Keywords: Sustainability, Corporate Social responsibility, Triple Bottom Line, Responsible Reporting

*Speaker

SDGs in Action – Service Learning & Sustainability: Exploring commitment to sustainable development

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Educational research has already proven that meaningful advances in teaching and learning can be reached through civic commitment. It applies to both individual learning results and general effects inherent to the institutional learning context. In this respect, service learning provides invaluable third-mission momentum that particularly encourages personalized, self-determined learning experiences in related fields of action. Promising prospects can certainly be attributed to aspects of sustainability for sound reasons: Sustainability constitutes a highly relevant and enriching domain of service learning, since it is future-oriented, innovative, increasingly in demand, activating, participatory/stakeholder-involving and cross-cutting; moreover, it calls for customized solutions and applications suitable for daily routines. Interestingly enough, these characteristics equally apply to service-learning and sustainability contexts.

Given the ambitious 2030 agenda on sustainable development goals (SDGs), sustainability frequently remains vague – even in scientific contexts – as to its educational implications, either too detached or too trivial in scope. Furthermore, science-driven debates on sustainability are perceived exclusive and ivory-tower-like; it has been criticized that they hardly enable permeability between science and society, commonly referred to as third mission – even though yielding respective effects is appreciated and essentially required! Instead, learning and teaching processes are increasingly threatened by fixed, curricular structures which restrict or preclude individual opportunities of self-conducted, exploratory learning. That is highly unsatisfactory since creative power is considerably wasted.

Thus, by obtaining first-hand insights into *SDGs in Action* a novel, higher-education learning and research assignment aims at elucidating to what extent purposefully-provided scopes for development of service-learning settings yield learning effects (cognitive, affective, behavioural) of students within the context of sustainability-oriented stakeholders and/or institutions of civil society and business sector. Such work-in-progress account assumes the challenging practice of directly contributing to the context-framing process of a cross-cutting SDG agenda. In first place, sustainability is to be made tangible, relevant and viable. Second, in which ways does the decision-making leeway of service learning (*third mission*) apply to the sustainability context?

Combining service-learning within sustainability contexts, five research propositions are supported of making sustainability/sustainable development...

*Speaker

- *tangible* in view of problem-based environments for personalized, self-determined and proactive learning;
- *process-focussed* in terms of coping with uncertainty and providing step-by-step solutions;
- *visible* due to publicity of achieved best practices;
- *viable* through fostering co-operative, inclusive mechanisms (team play) and joint accomplishment; and
- *adaptable* to shifting contexts as result of experimental creativity.

Keywords: service learning, SDGs, commitment

Interactive workshop: Global Sustainable Development

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What is the problem?
There is a lack of knowledge, consensus and proof of evidence

about how to behave in the sense of SDGs

to ensure a global sustainable development.

Sustainable development (SD) requires *action* by every single individual around the globe (United Nations, 2015); individual action that is based on international and local *awareness* around the topic (Pappas & Pappas, 2015) that is fed by reliable *information* and determined by positive *emotions* that enable willingness, force and guidance on how to behave in the sense of SD (Power, Beattie, & McGuire, 2017); and as a multiplier, everyone can transport its personal action in daily, family and friends' as well as social's and business' *life* (Ones & Dilchert, 2012).

On a macro-level, global problems are clear because each discipline such as biology, sociology, politics, or economics is able to outline challenges. (Local) experts can specifically precise these problems on the level of nations (Sachs et al., 2019). And means to reach the 17 sustainable development goals (SDG) are often implemented on micro-level by e. g. networks, organizations, and individuals. The multitude of instruments and initiatives are thus local and decentralized. Moreover, the question of what is right and what is wrong needs to be answered differently according to different contexts. Summed up, on the level of action for SD, there is a lack of consensus that derives from missing longitudinal evidence of particular means' success and from missing knowledge, awareness, and emotions.

Why is it important?

Each and every one needs information and awareness

to know how to act properly and thus,

*Speaker

be a part to reach global sustainable development according to the SDGs.

While institutions, global and local once, can design a framework of policies and funding for ideas, innovations, and means for SD it's the people who will make a difference...as individual, as employee, as volunteer, as role model. It is an individual decision to act in the sense of SD. And therefor, people need anchors of what that can mean.

Although, the topic of SDGs and SD is present in media, academia, and education there are lacks in knowledge or misunderstandings about basics. One reason why there are struggles with implementing action to reach the SDGs is its complexity. The SDGs consist of 169 target and they are represented by numerous indicators. If anyone would like to inform itself he or she rapidly is confronted with rather complex topics like hunger, pollution, and education. This complexity creates uncertainty, anxiety, and helplessness for people. And solutions for the mentioned problems are complex as well and not proven by evidence yet that this or that will contribute to a SD. To date, SD is still searching for answers (Pollitzer, 2018). Hence, the complexity of the topic can be confusing and deterring for individuals.

On the actual stage of informing and clarifying, interactive instruments such as workshops to do so are required. Instruments which prevent frustration caused by the topic's complexity and fundamentality, which give orientation about social, ecological, and economical challenges by comprehensible examples of problems people face around the globe, and inspire participants to continue dealing with the topic and step by step trying to act in the sense of SD. With such an instrument, knowledge is transferred where individuals build their own opinion from and leave with positive emotions about being able to deal with the topic. This enables empowerment of individuals to be an active part of SD world-wide as required by being a role model in daily and business life.

What did you do?

Based on the SDGs, a workshop was created, realized, and evaluated

to welcome individuals to deal with the topic

from their individually perspective, conviction, and level of knowledge

in a group setting and within an interactive, moderated, and phenomenological design.

The workshop is conceptualized as a structural constellation (Arnold, 2018). Up to twenty people can actively participate, a minimum of eight people is prerequisite. Further people can take part as silent observants during the active part of the constellation formation and join in during the subsequent discussion. The workshop can be accomplished indoor or outdoor and requires, determined by the number of participants, space of about min. 20m in length and 12m in width with 20 participants and without observants.

The workshop was developed, realized with consultants and international students, evaluated, and finally modified. The aim of the workshop is to give an initial event to enter the topic and to catch the participants at their individual levels of knowledge and emotions about SD. The

knowledge base of the workshop concept mainly is the Agenda 2030 with the 17 SDGs and its break down in 169 targets. Moreover, indicators to define, measure, and compare SD are used to design the workshop.

What did you find?

Emotions, dialogue, reflection, AH!-moments

The workshop builds on the imagination of the participants. Thus, getting involved by a participant requires her or him willingness and ability to use the personal imagination. If this is given, each participant contributes with his or her individual knowledge, emotions, and assumptions. The setting thus aims to achieve learning goals on an affective, cognitive and psycho-motor level (Airasian et al., 2001).

The workshop profits from a plenty of viewpoints, perspectives, and verbal and non-verbal inputs by each individual. These are given space and time to be reflected and discussed within the group, including potential observants and creates the learning effects for each participant.

The workshop works with assumptions every single individual carry about daily life issues regarding countries, professions, gender, and age. By taking a role that has information about these four issues the participant positions itself with its own knowledge and emotions and expresses this verbal and non-verbal and by answering 50 yes- or no-questions and thus formatting the constellation. The individual therefor is empowered by "your answer is always right and useful". The individual can hide itself behind its new role where it has its particular assumptions during the formation of the constellation. But he or she can also come back to him- or herself during the discussion and reflect on decisions on an abstract level.

Learning effects comes from emotions that develop during the constellation forming as the participants are not allowed to speak and share thoughts during that phase, too. A main point to experience is the feeling and perception of own and others emotion. During the discussing part, the participants learn to express feeling, thoughts and ideas and to listen to other perspectives and respond to them (on their own or to the group). It broadens the horizon of each participant.

Another level of learning is about questioning the used knowledge base of the constellation formation after the discussion. Especially the students directly asked for the facts about e. g. a country-based comparison, which method was used to gather them and which indicators formed the base for the investigation to do so. This part was initiated by the participants themselves and let to a contention that directly addressed scientific questions that are normally boring for students.

What do you recommend?

Realizing the workshop

Each individual, organization, and institution is addressed by the Agenda 2030 to be a part of SD. It is also obvious that everyone has a different understanding, focus or ideas, emotions,

and action to contribute or not when it comes to the SDGs. Creating awareness and developing a common understanding about SD is key issue to integrate everyone to enable change in regard of the SDGs. The workshop is one option to inform, catch attention, and inspire individuals to become an active and cognizant part. By realizing the workshop within universities, for profit and non-profit organizations, schools or consultancies people are positively informed and can, if willing, transfer their insights to others within their daily, work, and friends and family life.

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(Format: workshop of 90 min or oral presentation)

Keywords: SDGs, sustainable development, individual, workshop

ACHIEVING SUSTAINABLE ENTREPRENEURSHIP IN AFRICA: RELATIVE LESSONS FROM YOUNG ENTREPRENEURS BASED IN CAMEROON, ZAMBIA AND SOUTH AFRICA.

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INTRODUCTION

It can no longer be denied that for African countries to achieve economic growth best suited for their individual countries they have to create innovative economies and therefore promote a rather entrepreneurial business environment. Though entrepreneurship has been recognised as an economics growth solution, entrepreneurial growth rate has however been stagnant. According to Adusai (2016) replicative entrepreneurship seems to stunt the true potential of economic growth that could be achieved in Africa. Constantly policies and practice across different countries in Africa have been embedded on principles that were created for Western and Asian economies and ecosystems. These are not the same in most African contexts, though they may be similarities. It has become urgent to consider that there are unique factors at play in African countries which may differ from country to country as well. It therefore is important to learn the unique, indigenous factors that have become instrumental for entrepreneurs that have achieved sustainability in the African context.

The aim of this study was to explore the unique dynamics of entrepreneurship that increase the probability of succeeding and reaching accelerator phase in African entrepreneurship for black African entrepreneurs in the continent. It identified and used case studies from young entrepreneurs who come from Cameroon, South Africa and Zambia, and had been part of the cohort of entrepreneurial businesses identified by the UN-Universities Japan and ESDA (Education for Sustainable Development in Africa) workshop in 2016. Post the workshop up until the beginning of 2019 their cases were captured for an ESDA book to be published in the near future.

DISCUSSION

Murori (2017) identified three reasons that define stagnant entrepreneurship growth in Africa,

*Speaker

these were; ventures were too small to attract sizeable investments, which means they could not grow to their full potential. Limited factors of production were the second problem, faced by entrepreneurship in Africa, they could not easily access land, labour and capital which are important in production and lastly, innovation in distribution which is critical is not aligned to the distribution demand that exists. Mthembu, Kunene and Mbhele (2018) argue that the issue of connectivity and distribution in Africa is one that requires African solutions as opposed to what has been taking place because there are unique environmental conditions that have to be considered in connectivity and distribution. If entrepreneurs are unable to deliver their products and services their businesses are not going to survive. Entrepreneurs in Africa cannot rely on Government to set up infrastructure to enable them to do business, they instead need to become part of the solution of infrastructure building (Chiweshe & Ngan', 2019).

It is important to identify factors that these successful entrepreneurs seem to adopt in the African context, so that African entrepreneurship is better understood and can be used by the continent to improve it. There are factors that are important in the context of this continent, Manqoyi and Mthembu (2019) refer to the first factor which is role spirituality and religion play in developing entrepreneurship discipline in the South African environment. There is a relationship between spirituality and entrepreneurship that is required, the more an entrepreneur is recognised as a respectable productive spiritual citizen they are more likely to achieve success (Appadurai, 2013).

Due to the lack of infrastructure and limited production resources in Africa, as well as some unfavourable geographic landscapes one cannot rely on logistics and production systems that are created for the West and Asia, at some point it is imperative to make changes and embed business processes and production to African environments (Kunene & Mulenga, 2019). According to Chiweshe and Ngan (2019) it is not possible to do business in Africa without collaborating with various stakeholders. You must build relationships with various stakeholders to mitigate barriers due to unique environmental factors.

Research has found that socialisation, which includes education is a factor in entrepreneurship and it has insurmountable value in achieving success as an entrepreneur. In African countries where the environment is not conducive for many to be socialised in a way that will add value towards them taking up entrepreneurship it becomes imperative to understand alternative socialisation structures that are being adopted to develop Entrepreneurship Intention.

What makes Africa different is that the problems it has, provides opportunities unique to her. It is important to understand the people of Africa when doing business and placing them first. The solution, which becomes the product and or service needs to be centred on the fulfilment of the needs of the people in a way that they best understand them. Purpose therefore becomes central in how African Entrepreneurship works (Kunene & Kgatlhanye, 2019). Purpose is best described by Nobuntu Webster, Director of African Pursuit as achieved by "asking yourself, 'what moves you?' What can you not ignore? What do you want to change?" (Mlambo, 2019). African entrepreneurship is deeply entrenched in knowing your purpose as an entrepreneur.

METHODOLOGY

The study conducted was a secondary study relying on existing cases. It used four different cases to explore the concept of what African Entrepreneurship is. The cases appear in a UN-Universities (Japan)/ESDA upcoming book on African Entrepreneurship. For purposes of this study, the individual cases which made up the data that formed the chapters that are

still in progress were triangulated. This meant the study used Data Source Triangulation as found in qualitative studies which benefitted the study as the phenomenon in question would be understood more in depth and thus the outcomes would be more comprehensive (Carter, Bryant-Lukosius, DiCenso, Blythe & Neville, 2014).

It was important to gather cases from different parts of Africa to identify common factors. It cannot be stressed enough how the differences between different countries in Africa should never be ignored, regardless of that which is common, however, those are activities for purposes beyond this paper. The study used the case titled *Believe: The Spirit of Entrepreneurship* run by entrepreneur V. His solar business is based in the northern township of KwaZulu-Natal, South Africa called eSikhaleni. The next case was *Being a young entrepreneur in Zambia: Lessons from my business and for my business*, a business by entrepreneur X in industrial printing based in Lusaka Zambia. This was followed by *Beginning, Managing and Growing an African Empire*, a case of an entrepreneur who started a natural skin care range in Cameroon, referred to as Entrepreneur Y. Lastly, there was *My World, My Reality, My Business,* a case of entrepreneur Z whose business recycles waste to make school bags and clothing, her business is based in Gauteng, South Africa.

The cases appear in the forthcoming book as previously mentioned, where each entrepreneur discusses their success, failure, environment and lessons learnt. By triangulating these cases, the quality of data could be deemed more credible (Salkind, 2010).

Relational content analysis was best suited to this study for its ability to investigate relationships in concepts found within text (VanBaren, 2017). Where there are various sources of data to consult, as per this study it therefore is imperative to use a form of protocol to guide the extraction of relevant data. For purposes of this study the following protocol key words, their meaning and wide definitions were such a guide:

1. Socialisation

2. Ecosytem

3. Business Model

4. Functional Management

5. Clients

RESULTS & CONCLUSION

The results of the study found that as much as it was important to learn from the Western and Asian countries, it was more important to understand that the environment was different in Africa and it required different approaches to entrepreneurship, that emphasized, Purpose, People, Profit, Planet, Public and Private Sector. In recognising this it was apparent that entrepreneurship practice in these three countries was embedded on the continents indigenous knowledge systems to yield success i.e collaboration also known as Ubuntu. In future, similar research would have to be conducted in other countries in the continent as part of a more comprehensive exploration. This will help build appropriate policies and strategies for economic growth through entrepreneurship.

Keywords: Infrastructure, Purpose, Ubuntu

Sustainable alternatives in silk production

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The textile industry is currently facing the greatest transformation in its centuries-old history. Climate change, microplastics in the oceans, poor working conditions for the countless workers in Asian and meanwhile African factories, emissions of toxic chemicals and a share of approx. 8-10% [1] of the worldwide CO2 emissions lead to changes in consumer behaviour and even to the abandonment of consumption by an increasing number of textile costumers. In the course of these developments, animal welfare issues are increasingly coming onto the agenda. Voluntary global standards for wool, mohair and cashmere already exist or are being developed. The focus is on the welfare of the animals as well as that of the farmed country [2] [3] [4]. In addition, the fashion companies also become aware of the abuses and therefore remove some fibre materials from the range [5] [6] [7]. In this context, silk production will also have to change to a more sustainable approach to silk moth species in the future.
China, as the country of origin of silk, still produces by far the largest proportion, approx. 75%, of this premium fibres in the world. India follows with a share of about 22 % of the worldwide silk production in 2018 [8]. A prerequisite for fibre production is the presence of mulberry trees [9]. Their leaves serve as food for the caterpillars of the mulberry moth. *Bombyx mori* [10], as the most important silkworm is called, does not live in freedom, but has been kept exclusively in breeding for centuries. The procedure is as follows: The mulberry moth lays eggs from which caterpillars hatch. These receive the mulberry tree leaves already mentioned as food. The caterpillars grow for 33-36 days until they spin themselves into a cocoon. As a cocoon thread, the caterpillar produces two individual fibrion threads which are glued together with silk gum also called sericin [11].

To obtain the silk filaments using the conventional or rather classic method, the cocoons are treated with high temperatures in the drying. This leads to the killing of the pupa of the silkworm, which is still in the cocoon. For obtaining the silk filament (unwinding) the cocoons are soaked in boiled water Thus, the sericin softens, dissolves partially and makes it possible to unwind a raw silk thread, approx. 800 – 1000 m long, with the aid of a reel. Subsequently, further treatments of the raw silk are conducted (degumming of the silk filaments by treatment with soapy water or rather lye, finishing and weighting of silk). [9, 11]

Silk is a renewable material which, compared to other fibre materials, has a low environmental impact and is biodegradable [10]. However, the following aspects of conventional silk production are to be classified as questionable with regard to their sustainability.

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From an ethical point of view, the killing of the larvae during the boiling of the cocoons is to be regarded as the main problem. The larvae are not given the opportunity to hatch as mulberry moth and complete their natural metamorphosis process. Another aspect is that a small amount of silk requires large amounts of resources. For the production of a shirt from silk, for example, approx. 500 cocoons or caterpillars are necessary, which approx. 32 kg of mulberry leaves must be fed for sufficient growth [12]. A mulberry tree has a leaf yield of approx. 7 kg per year [13], which means that the annual yield of more than four trees is required. The trees also require adequate care and maintenance. In the case of trees planted mostly in monocultures, the use of fertilisers is indispensable, which in the long term can contribute to soil change and increased nutrient input into the oceans through overfertilisation. The use of pesticides for pest control is also common practice. [10]

The irrigation of the trees accounts for a large part of the water consumption for silk production. In addition to the high consumption of foliage, the energy consumption required to process and transport the silk must also be taken into account [10]. Another problem is the intensive treatment (finishing) of the silk for facilitating good processability on industrial plants and for satisfying the requirements to colour and microbiological stability, antistatic agents etc. Therefore, substances of toxicological concern are used partially [15].

On the one hand, this leads to water pollution, and on the other hand, the improper handling of the substances can cause health damage to the workers. [10]

The latter as well as the following addresses the aspects of social problem. Since the selling price of silk depends on its weight, it is treated with metal salts (e.g. chromium and lead) after weight-reducing degumming [11] [14]. By making the fibre material heavier, the weight can be increased three to four times [14]. However, the salts used can cause serious damage to the health of both the processor of the chemicals and the carrier of the fibrous material [15]. Furthermore, the whole silk production process is labour-intensive. Instead of the workers being paid accordingly, they receive only a small remuneration. Moreover, in many cases it is child labour or even child slavery. [10]

The mentioned aspects and problems require action.

"Sustainable silk" can make a contribution to problem solving. This term is used to describe various types of silk. Compared to classical silk, organic silk is more environmentally friendly and sustainable, since no chemicals are used for raw silk production. In addition, silkworms can pupate, hatch as moths, lay eggs and die naturally ("non-violent" silk). Consequently, cocoons with discontinuous silk filaments are used. Wild silk also falls under this term. These are alternative silks to those of mulberry moth. The breeding of butterflies and larvae usually does not take place in captivity, but in the wild. There is no deforestation and the silk production is more environmentally friendly in comparison. Frequently used wild silks are Tasar/ Tussah-, Muga- and Eri-silk [16]. The latter is also known as peace silk or Ahimsa silk (Old Indian: Ahimsa = not violating [17]) [12] [16]. Depending on the species, the cocoons can be processed differently: closed cocoons can be unwinded. However, this is not possible with open-ended cocoons (pierced). In the latter, the cocoon has an opening through which the moth can hatch [18]. This is the case, for example, with Eri silk [19]. Differences to mulberry silk are common to all. These include higher strength, species-dependent finenesses, different shades [16]. Further sustainable silks are recycled silk and vintage silk, based on the longevity of silk with appropriate handling and care. [10]

The Cocccon company can serve as a role model when it comes to not only treating fibre producers in the form of caterpillars or moths in a sustainable manner, but also taking social and

other ecological aspects into account: Cocccon is an Indo-Germanic company, which combines an ecological fashion label with a biological breeding of Tussah silkworm for the production of non-violent silk. The breeding involves an entire village community, both men and women, and both manpower and resources are used sustainably. It is a modern form of rural cooperation in which silk farmers, spinners and weavers can work from home and coordination and collection are handled from a headquarters. The caterpillars are fed with leaves of the Arjuna tree native to India. The caterpillars are on the trees until they are pupated and are protected from predators by nets. In order to protect the trees from pests and fungi, special liquid solutions made exclusively of natural ingredients are used, which have no toxicity. After spinning, the silkworms can undergo their metamorphosis and the moths can hatch. The subsequent spinning process is mainly manually operated, and the electrical energy required for the production processes is obtained from solar panels. The procedure for degumming is certificated by GOTS and REACH. [20, 21]
In the future, further solutions will have to be worked out which could, for example, consider shortening transport routes and thus reducing greenhouse gases.

Keywords: Sustainable Textiles, Silk Production, social entrepreneurship

A Future-proof smart materials' network

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A Future-proof smart materials' network
What is the problem?

The massive increase in the complexity of our working and living environment creates new challenges for the products we use and the technical systems that surround us. Currently, an intelligently networked and primarily digitally controlled physical environment is establishing. Usually this environment consists to a large extent of small-scale components e. g. sensors, actuators, and drives. The result is a desire to simplify these components in order to get more clarity about them. Functional materials (smart materials) proved to be new bearer of hope in tackling this problem. In the specific case, the material classes thermal and magnetic shape memory alloys, piezoceramics, and dielectric elastomers are focused. The maturity of these four categories varies greatly. On the other hand their broad application is set against technical hurdles, missing supply chains, and acceptance issues. The recycling of composite structures, as an important prerequisite for the ecological side of sustainability, is still largely unexplained.

Why is it important?
The use of smart materials was for us associated with a paradigmatic turnaround. Our new paradigm is to ensure functionality at the material level. These related functional integration of smart materials into other material systems must be scientifically and technically resolved, understood by the manufacturers and users in a mental sense and safeguarded according to the whole material chain. In order to accomplish these tasks and to achieve the desired innovation, sustainability thinking seems to be indispensable.

What did we do?
First of all, engineers, entrepreneurs, natural as social scientists, and industrial designers founded a highly interdisciplinary research network with a unique identity and a strong name. This initial team sought suitable funding, won a competition, got the necessary funds and is now in the success phase of the funding program as a cluster of excellence. Targeted public relations work was carried out with the research results obtained and the method gain, also specified internationally and to a wide range of target groups. Today, a large number of demonstrators are available that make the paradigmatic approach of using smart materials tangible and demonstrate its future viability. The network now has 150 members. Its development and the current structure are presented graphically in the presentation.

What did we find?

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Three research results, each representing one of the three pillars of sustainability in the economy, environment and social issues, are presented as examples. It is about the cost efficient manufacturing technology *PermaVib*, the safety of lightweight structures *smart frame +* for an ecologically friendly mobility, and a didactic exhibition of the different material classes *smart materials satellites* at world-famous institutions. The project results will by pictorially presented and their potential for sustainable development highlighted. Specifically, they can be characterized:

- *PermaVib* delivered a piezoceramic-based tool module that provides short metal shavings in the machining process by imprinting vibrations. The industrial application of this tool module provides higher cutting speeds by lower tool wear in order to achieve a significant reduction of the manufacture costs.
- *smart frame +* senses bicycle frames and transmits measured load forces to location-dependent driving conditions (GPS) on a tactile interface in the handlebar grips, thereby avoiding accidents and extending the lifetime of the frame. The collateral benefits are tactile navigation and increased anti-theft safety. This fundamentally supports the transformation from the automotive to a muscle-driven mobility.
- smart materials satellites brought our first demonstrators in two research workshops of a world-famous a museums and a well known museum of science and technology, where children and students could get up close and personal with smart materials. The intended effect was to make our next generation fit for sustainable materials and appropriate technologies.

The demonstrators resulting from the projects could be tested at trade fairs, exhibitions and in workshops. Their degree of interactivity and the associated learning success were tested in various event formats. The results of research projects as well as the reports of exhibition events are published e. g. in our annually magazine (it's title stands for magic materials) and communicated online too.

What do we recommend?
The continuation of the network beyond the funding period and thus an increase in knowledge and competence growth is recommended on the basis of previous experience, both internally within the network and in contact with the network partners. Subsequent accompanying research can further intensify the economic, ecological and social effectiveness of the collaboration between science, industry, art, and design. Of the established network formats, those with educational effects and those that make the network's expertise public, are likely to prove their worth. Last but not least, sustainable success is reflected in the continuity of exchanges, interdisciplinary and transdisciplinary understanding, and the actively moderated demand from small to medium-sized enterprises as well as from companies. This in turn requires market demand for products and services using smart materials.

Keywords: research network, smart materials, technological innovation, interdisciplinary, sustainable material chain, next generation, design

Evaluating Corporate Social Responsibility Strategies and Practices in Water Management for Sustainability in sub-Saharan Africa

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Wise management of water resources and services not only benefits public health and environmental quality, but is also the true driver of socio-economic development and political stability and is fundamental to business development, and to any sector that is a water user. The United Nations' 2030 Agenda takes into consideration the growing global concern over the availability and quality of water resources, not just to meet supply and sanitation needs, but also to satisfy the world's increasing demand for water in the face of rapidly expanding populations, agricultural intensification, urbanisation, industrial production, pollution, and climate change. Corporations manage contributions to sustainable development and that is what corporate social responsibility (CSR) is about (Abreu, 2015). The concept of CSR and what it means for companies is embedded in a larger argument over what exactly the role of the corporation is in society (Reeve & Pincin, 2018). The premise of the CSR movement is that corporations, because they are the dominant institution of the planet, must squarely face and address the social and environmental problems that affect humankind (Westfield, 2002, Herrmann, 2004). CRS considers that a corporation is not just a self-centred profit-making entity, but that the company and its actions are also integral to the economy, society, and environment in which they occur. Businesses have the social responsibility to adapt their practices to help achieve the ambitious vision of the 2030 Agenda (Oxfam, 2017) which include the Sustainable Development Goals. Corporations are therefore, powerful actors who have the capacity, and debatably, the moral duty to be agents of development by pursuing corporate activities that foster communal and ecological responsibility (Blowfield, 2010, Wachira, 2019).

Many countries in sub-Saharan Africa face the resource paradox of plenty in which these countries consistently fail to turn their wealth in natural resources into an increase in even a basic standard of living for its citizens (Reeve & Pincin, 2018). The concept of the resource paradox implies that citizens are ultimately harmed through the extraction of natural resources (Keblusek, 2010). The continent is also described as being characterised by deeply embedded development crises rooted in heightened levels of poverty, conflict, dependency and weak regulatory institutions, among other things (Arrighi, 2002; Hong, 2015). A variety of institutional conditions influence corporations to act in socially responsible ways. Such behaviour is more likely to occur to the extent that corporations are monitored by strong state regulation, collective industrial regulation, NGOs, and other independent organisations (Abreu, 2015). The

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institutional framework of each country reflects its distinct history and the peculiarities of its socio-politico configuration (Jamali & Mirshak, 2007). Therefore, given the sub-Saharan economic, socio-political and environmental conditions, it is necessary to make an enquiry into the contribution of the private sector to the continent's sustainability and sustainable development (Idemudia, 2014, Ameshi & Idemudia, 2015). This leads to the focus and contextualisation of this study.

This study seeks to assess how CSR practices of corporations operating in sub-Saharan Africa are contributing to sustainable water management. There is little available evidence of policy reforms that focus on redefining CSR policies among business enterprises to fit a sustainable development agenda in Sub-Saharan Africa. Yet, corporate social responsibility has been touted as a possible remedy for the ills of globalisation that hinder the realisation of sustainable development. CSR considers the company and its actions are integral to the society, and the environment in which it operates. The current study seeks to make three contributions. First, a comparative assessment of CSR practices by MNCs in developing countries vs. respective practices in developed countries will be made. This uncovers whether CSR practices by MNCs play a similar role in sub-Saharan Africa as in developed countries. Second, an evaluation of CSR practices by medium and small enterprises operating in selected organisations and sub-Saharan countries will be conducted. This aims to highlight the landscape in terms of adoption of CSR practices and strategies by different corporations in different sub-Saharan states. Third, by conducting this study in different companies and across different nations, the study highlights the institutional dynamics which could be affecting adoption of CSR practices within sub-Saharan African countries vis a vis, laxity or lack of regulations which is a common feature of developing or least developed countries. Ultimately, this study adds to the paucity of CSR knowledge in sub-Saharan Africa which has been extensively and progressively documented.

Preliminary data collection for this study is CSR information on disclosures related to SDG 6 which is transmitted by corporate communication of companies of the selected corporations operating in sub-Saharan countries. This includes CSR information integrated with annual/financial reports, CSR information disclosed through special/sustainability reports, and other financial, environmental and social reports. As with similar previous studies, content analysis will be used to codify and quantify the amount of text from the reports on the basis of selected criteria which assumes that frequency is the importance of a subject matter's importance (Krippendorf, 2004, Guthrie et al, 2004; Abdolmahommadi, 2005). Key words are derived from the Global Reporting Initiative (GRI) guidelines covering environmental perspectives. As projected areas for further research, primary data to corroborate the findings of this current study will be collected using interviews and the ultimate goal will be the use of decision making techniques for possible transfer of technology in sustainable management of water.

In their study comparing CSR practices in Europe and the US, Matten and Moon (2008) reviewed differences within the countries and explored whether [CSR] communications are explicit or explicit. They found that national differences in CSR practices could be explained by political, financial, educational labour, and cultural systems (Sa de Abreu et al., 2015). In their study, Reeve and Pincin (2018), posit that while CSR has been increasingly presented as a part of a company's core values and tied to the pursuit of the triple bottom line of profit, planet, and people, European companies are likely to pursue CSR strategies when they are under scrutiny by stakeholders (Cedillo Tores, Garcia-French, Hordijk, Nguyen, Olup, 2012; Forte, 2013). In another study by Steurer, Martinuzz & Margula (2011), the authors reaffirmed the gap in promotion of CSR policies between Western Europe and Central and Eastern Europe (CEE). They concluded that the only noteworthy actors that currently bridge the 'CSR gap' between Western Europe and their CEE counterparts are multinational companies active in the CEE region as well as export oriented companies with close ties to Western Europe or other parts of the world

(Fekete, 2005; Vsiljev, 2005; Vasiljeniene & Lewicka-Strzalecka, 2006; UNDP, 2007; Struer & Conrad, 2009). Against the findings above, and as this study is currently underway and the findings from the study are only the expected, the study is anticipated to uncover the disparities in the application of CSR practices by MNCs in sub-Saharan host countries compared to how CSR is practised by the same companies in their home countries, characteristic of the socio-economic and political conditions in sub-Saharan in comparison to the developed world. In addition, due to the diversity of the sub-Saharan countries in terms of development, there are likely to be differences with regards to the levels of how CSR has been adopted by the different countries of the region.

The recommendations that will stem from this study seek to inform policy development in sub-Saharan Africa across the 2030 Agenda as SGD 6 goes further than water supply, sanitation, and Hygiene to include all aspects of the water cycle and exclusively recognises that water has impact across the entire sustainable development agenda (Ortigara, Kay, Uhlenbrook, 2018), through its linkage to several other SDGs. This will in turn lead to promotion of integrated water resource management (IWRM) across the region. As the study also includes evaluating CSR practices of MNCs both at home and in host countries, it plays a large and essential part in bringing recommendations on paradigm shifts in business operations, innovations and best practices from developed countries to the global development agenda by stimulating the use of water management tools and making them globally available. And since water is a subject that concerns all aspects of human development including health, agriculture, education, economic productivity, and even peace and stability, any recommendations of steps to sustainable water management will solve a myriad of other developmental barriers in sub-Saharan Africa. This resonates with the United Nations Secretary General description of SDG 6 as the 'docking station' for all the SDGs and the 2030 Agenda (UNESCO, 2018).

Keywords: Corporate Social Responsibilty, Multinational companies, Sustainability, Sub, Saharan Africa, Water management

Suggestions for improving the promotion of energy saving in Germany

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Sustainable development means to meet the needs of the present without compromising the ability of future generations to meet their own needs.[1] The environmental, social and economic dimensions must be taken into account.[2] One area of action in terms of sustainable development is energy efficiency.[3] In this context, the German state provides a wide range of funding. Support is provided in the form of (non-repayable) grants and loans.[4] Grants are usually payed as a **fixed percentage** on the investment amount. The relationship between the **investment amount** and the potential **cost savings** for the investor resulting from the proposed measure is **not** normally **taken into account**.[5] This could be an obstacle for projects aiming at energy saving in Germany. Perhaps this situation prevents necessary contributions of the German people and companies to reach the goal of sustainability. Under the assumption that a private individual or an entrepreneur acts as a rational benefit maximizer (homo economicus), it is likely that only those investments will be carried out that are linked to an individual benefit for the investor. This means that the well-being of future generations (which is an essential part of sustainable development, see above) is not a decision criterion for a rational benefit maximizer. A homo economicus will only invest in sustainable technologies if there would be any advantage for this person during its lifetime.[6] Under the assumption that the basis of orientation for a rational benefit maximizer is the relationship between costs and returns, an investment would make sense if it ceteris paribus leads to lower costs or higher returns. The investigation focused on ways to reduce costs through sustainable investments. A specific federal funding programme was taken into account to illustrate the problem and as a basis for considerations for improvement. The German name for the programme is 'Energieeffizient Sanieren – Investitionszuschuss' (English: 'Energy-Efficient-Rehabilitation – Investment Grant'). The aim of this programme is to support measures to reduce energy consumption and carbon dioxide emissions in existing residential buildings.[7] The grants are paid as a **fixed percentage** of the investment amount (as is usual in Germany, see above). The profitability of the projects is not taken into account. The research questions were: Do activities to reduce energy consumption and/or carbon dioxide emissions of existing residential buildings in combination with the programme 'Energy-Efficient-Rehabilitation – Investment Grant' in any case lead to a cost reduction for the investor? And if not, what changes could be considered to make this programme more attractive to investors who are rational benefit maximizers?
In order to answer the research questions, the following steps were carried out:

a) modelling of projects to reduce energy consumption in residential buildings in Germany

b) estimation of the investment costs of the project[8]

*Speaker

c) calculation of the amount available for the project from the 'Energy-Efficient-Rehabilitation – Investment Grant' programme

d) estimation of cost savings for the investor per year through energy savings[9]

e) calculation of the capital value of the project (with investment costs as cash outflows and investment grants/cost savings as cash inflows)

If the capital value is greater than 0, the project is worthwhile because the investment leads to an overall cost reduction for the investor (cost savings/grants higher than investment costs). If the capital value is 0 or lower, the project would be rejected because the investment does not lead to a reduction in the investor's overall costs (cost savings/grants below investment costs). For the calculation of a capital value, the **duration** of the investment and the **discount rate** are necessary input variables. According to the homo economicus model, it was assumed that the investment is only favourable if it pays for itself by the end of the investor's life. Therefore, within the investigations the expected **duration** of the investment was set equal to the life expectancy of the investor or (if this is shorter than the life expectancy) to the useful life of the investment object. Three alternative approaches were considered for deriving the **discount rate**.

a) interest rate for raising capital

b) social discount rate

c) minimum of an individual discount rate

The investigation provided evidence that the **following case groups exist:**

Case group 1: the **capital value** of considered projects is **negative**, regardless of the approach used to derive the discount rate, the **projects would not be advantageous despite the subsidies paid**

Case group 2: the **capital value** of considered projects is always **greater than 0**, irrespective of the approach used to derive the discount rate, this would have been the case **even if a grant had not been paid**

Despite the promotion, the **projects of case group 1 would be rejected by a rational benefit maximizer**. Thus possible **energy savings would not take place**. This fact is obviously an obstacle to achieving sustainable development. The **first research question** can therefore be answered in such a way that **measures to reduce the energy consumption** of existing residential buildings **in combination with the 'Energy-Efficient-Rehabilitation – Investment Grant' programme** do **not always lead to** a **cost reduction** for the investor. Projects of **case group 2** are such which are **supported although** they would be **advantageous** for a rational benefit maximizer **without any grant**. This is unnecessary expenditure for the state.

In response to the second research question, the following changes are proposed for the programme 'Energy-Efficient-Rehabilitation – Investment Grant': In the future, the **grant amount** should be **determined on the basis of the capital value of the investment.** The **grant** to be paid should **make it possible** to achieve a **capital value of more than 0.** However, this must not result in an inappropriately high excess return for the investor. This would lead to a sensible redistribution of the subsidies:

- elimination of subsidies for projects that would make economic sense even without a subsidy in favour of
- projects that would not be carried out under current funding practice

The proposed interest rate for discounting in the capital value calculation is the social discount rate, because it is assumed that this is used (consciously or unconsciously) as a benchmark by the majority of potential investors. It is recommended to examine whether the proposals drawn up are also applicable to other funding programmes in Germany.

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Foot notes

Cf. United Nations (1987), p. 24.

Cf. United Nations (2015), Resolution adopted by the General Assembly on 25 September 2015, p. 1.

Cf. Bundesrepublik Deutschland (2015).

Cf. for example Bundesministerium für Wirtschaft und Energie (2019a, b, and c).

Cf. for example Bundesministerium für Wirtschaft und Energie (2019, d).

For further explanation of the concept 'homo economicus' see for example Kowalewski, J. (2008), p. 81.

Cf. Kreditanstalt für Wiederaufbau (2018).

For the estimation a calculation tool of the Robert Bosch GmbH, Gerlingen-Schillerhöhe, was used. The calculation tool is available under https://application.effizienzhaus-online.de/sanierungsrechner/#?st (downloaded on 30 July 2019).

Approach analogous to foot note 8.

Keywords: energy saving, financing, funding, grant, government, state, sustainability

Extent and Nature of Green Advertising in Magazines in South Africa: A Content Analysis

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1

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The earth is in a state of crises, due to environmental degradation, ozone depletion, global warming, resource depletion and other green problems (Chen & Lee, 2015). Utilising a systems approach requires all components in the system to play their part in achieving sustainability (Wymer & Polonsky, 2015). Some businesses are addressing the issue through greening their processes, developing green products and supporting environmental causes (Hardin et al., 2019; Narula & Upadhyay, 2011), but to achieve sustainability, consumers also need to be involved and commit to sustainable behaviours (Liobikienė & Bernatonienė, 2017). Some research indicates that consumers are becoming more concerned but behaviour is lacking (Kong, Harun, Sulong, & Lily, 2014; Witek, 2018). Seyrek and Gul (2017) argue that a lack of awareness of green products and activities is often cited by consumers as a reason for their lack of behaviour.
Organisations can make consumers aware through green advertising (Leonidou, Leonidou, Hadjimarcou, & Lytovchenko, 2014) which has also been found to influence consumers green behaviour (Rahbar & Abdul Wahid, 2011). Green advertising has been evident in television, newspaper and magazines (Dai, Fam, Mao, & Huang, 2011; Kim & Han, 2016) in Turkey (Akyol & Kilinç, 2014), India (Dande, 2012), the United States (Baum, 2012; Segev, Fernandes, & Hong, 2016), South Korea (Kim, Oh, Yoon, & Shin, 2016) and the United Kingdom (Baum, 2012). Studies in South Africa have found that South African consumers say they are not aware of green products and they don't always know when products and organisations are green (Mkhize & Ellis, 2018). However, little is known about either the extent or nature of green advertising in SA.

This research aimed to address this gap in knowledge by determining how a green message is communicated in South African magazine advertisements. By analysing the nature of green advertising, creative strategies for better utilising the elements or components of adverts can be proposed to ensure greater effectiveness in making South African consumers more aware and knowledgeable of green products and organisations, and thus potentially narrowing the green gap by assisting consumers, a critical cog in the sustainability system, to behave in a more environmentally friendly manner.

This study followed a descriptive design and mixed methods, deductive content analysis research approach on 66 magazines that were selected using a simple random sampling. The

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selected magazine sample contributed a total of 1186 advertisements from which 84 green advertisements were found, indicating the extent of greenness. The content analysis of the green magazine advertisements provided insight into the nature of the green advertisements. The conceptual foundation of this study was informed by advertising theory that contributed the deductive protocol used to analyse the advertisements in order to determine the nature of green advertisements. Literature on advertising indicates that green marketers use advertising appeals (Hartmann, Apaolaza, D'Souza, Barrutia, & Echebarria, 2015), message structure elements (Tu, Kao, & Tu, 2013), message content addressing green problems (Chen & Lee, 2015) and/or proposing green solutions (Aytekin & Celik, 2017) to enhance effectiveness of the green message communication in green advertisements. According to Chen and Lee (2015) using message structure elements make the green message in an advertisement more effective. Message framing (Segev, Fernandes, & Wang, 2015), message explicitness (Usrey, 2017), inclusion of environmental claims (Kim, Lee, & Hur, 2012) and inclusion of eco-labels (Testa, Iraldo, Vaccari, & Ferrari, 2015) are message structure elements. Green problems may manifest in terms of water scarcity (Shah, Liebrand, Vos, Veldwisch, & Boelens, 2018), global warming (Lin & Hsu, 2015) and depletion of natural resources (Shahnaei, 2012). According to Chen and Lee (2015) green advertisements help highlight and raise awareness of green problems. Green marketers also propose green solutions in green advertisements that would help mitigate consumer's negative impact on the environment (Tan, Johnstone, & Yang, 2016). By proposing green solutions consumers become receptive to environmentally conscious firms (Aytekin & Celik, 2017).

The findings of the study provide insight into the extent and nature of green advertising in magazines in South Africa. Firstly, this study found 38 magazines (57.6%) contributed 84 green advertisements (7.1%) of the 1186 advertisements. Segev et al. (2016) reported that green advertisements were on the increase in magazine advertising. The results of the current study however indicate that the majority of firms advertising in these magazines are not communicating a green message. Only 3.6% of the adverts explicitly communicated a green message. This study found that the Adventure & Outdoor (16.7%), Home & Gardening (8.3%), NPO & NGO (7.1%), Cosmetics & Beauty (6.0%) and Energy (6.0%) sectors contributed the most green advertisements, with the remaining advertisements contributed by 33 business sectors. These findings are different to those reported by Leonidou, Leonidou, Palihawadana, and Hultman (2011) where the manufacturing sector contributed most (93%) of green advertisements in their global survey. The current study found that 72.3% of green advertisements are contributed by South African firms and 27.7% by international firms from both developed and developing countries. Contrarily, Leonidou et al. (2011) found that most (92.5%) green advertisements are contributed by organisations from developed countries.

In terms of the nature of the green advertising, 77.4% of the 84 green advertisements used rational/benefit appeals followed by individualistic (34.5%) and imagery appeals (31.0%) whereas collectivistic, hope, guilt and fear/threat appeals were seldom used. Similarly, Jovanović et al.'s (2017) study in Belgrade (Serbia) found rational appeals were most often used.

The study found that the message structure elements in the green magazine advertisements in South Africa consisted of environmental claims, message explicitness and inclusion of eco-labels. The main type of environmental claim found was product-oriented claims (41.7%). Lee's (2014) study in Japan also reports product-oriented environmental claims were most often used (82.2%). In terms of message explicitness the advertisements fell almost equally into the two categories (explicit and implicit message, 51.2% and 48.8%, respectively). Explicit messages are often preferred because of their ability to provide details on how the advertised product is green (Kim et al., 2016). However, using implicit message in which the green message is subtle and less concrete, is also effective because it enhances compliance (Kronrod, Grinstein, & Wathieu, 2011). With the inclusion of eco-labels, this study found only 3.6% of the green advertisements

used this message element. This is consistent with Atkinson and Rosenthal, (2014) and Testa et al. (2015) who indicated that the inclusion of eco-labels influences and enhances consumer's likeliness to purchase green products. The study revealed that green advertisements in South African magazines mainly addressed six green problems: water scarcity (13.1%), air pollution (7.1%), water scarcity (6.0%), animal protection/welfare (4.8%), land pollution (4.8%) and water/sea pollution (2.4%). The green advertisements proposed 16 green solutions with healthy living (31.0%), pollution reduction (11.9%) and resource preservation (10.7%) being the most common solutions. Sonnenberg, Erasmus and Donoghue (2011) reported that consumers consider green solutions important and should be included in green advertisements to enhance green message communication. Haytko and Matulich (2008) suggest the growing number of environmentally concerned consumers results in more organisations providing green products that help these consumers address green problems.

Recommendations are proposed for green marketers, academics, policymakers and for future research. For example, the results on message explicitness indicate that green marketers could help green message communication by making the message more explicit. Almost half of the green advertisements contained implied green messages. These could potentially be missed or misinterpreted by consumers. Bickart and Ruth (2012) argue that consumers are suspicious of green advertisements and thus building trust through green communication is important to encourage consumption of green products and support for organisations committed to environmental sustainability. Academics, organisations and policymakers could decide on and articulate finer and more explicit criteria determining what is green thus improving message explicitness. To encourage green advertising both in terms of the extent and the creative execution, across the various advertising media, the government could implement yearly initiative/s (awards or ratings) that would acknowledge the best green advertisements. The South African public could be given a chance to vote or recommend the best green advertisements. Such initiatives would reward excellent work and simultaneously enhance attention to and the development of green knowledge in South Africa. Minton, Lee, Orth, Kim, and Kahle (2012) suggest that more organisations are expected to increase their online advertising budget with some still preferring to focus their media budget to traditional media. Thus, future research could extend this investigation to websites, social media and television mediums. This could result in a more complete assessment of the status quo of green advertising in South Africa. Secondly, future studies could investigate the use of Corporate Social Responsibility and Corporate Social Initiatives in enhancing green communication in South Africa. Finally, this research determined the extent and nature of green advertising in magazines in South Africa as an indicator of what businesses are communicating to consumers about their commitment to sustainability but future research could investigate the effectiveness of green advertising in enhancing green knowledge development and ultimate green behaviours amongst South African citizens, to incorporate better understanding of another key component of the system needed to achieve sustainability.

Keywords: magazine advertising, green advertising, advertising appeals, message explicitness, message elements, South Africa

Reimagined Curriculum Paradigms: A new response to marketing sustainability curriculum

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Research problem

Sustainability has emerged as a broad-based global trend that impacts on the concept of 'planet and people'. Consequently, the emergence of sustainability issues in the context of marketing theory, marketing curriculum and marketing practice is interrogated in this research paper. Accordingly, this resulted in a questioning around the conceptualisations of sustainability marketing and the relevance of sustainability marketing in the marketing curriculum.

There is little contention that marketing continues to be shaped by dominant Western Eurocentric canons, and that traditional neoclassical marketing principles have remained largely uncontested. Marketing Management, a prominent sub-discipline of the broader Management field has a similar genesis and history. Dominant, powerful knowledge continues to hold sway in traditional higher education marketing curricula across the world and in South Africa, with disciples of the discipline further entrenching this knowledge hegemony, despite critique of the perils that traditional marketing is posing to the sustainability of the planet.

In this paper, we report on a study that has as its focus, the issue of sustainability in the context of marketing theory, marketing curriculum and marketing practice. The paper investigates conceptualisations of sustainability marketing and the relevance of sustainability marketing in the marketing curriculum in higher education institutions in South Africa with a view to identifying the status and presence of sustainability marketing in the extant marketing curriculum.

Importance/rationale of the study

This study drew on the tenets of Critical Marketing Research. The research process entailed a content analysis of higher education institutional handbooks and marketing course outlines.

In an attempt to uncover the perspectives of those that have influence in the design and construction of marketing curriculum, semi-structured participant interviews were conducted with marketing educators and sustainability practitioners at various higher education institutions in South Africa.

Whilst there have been inroads made into incorporating sustainability into the marketing curriculum[1], these have been made at the level of simply altering the existing marketing curriculum[2] or reconstructing a new marketing curriculum. It is at the level of reconstructing

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marketing curriculum where most transformation is required. However, to understand how to transform or reimagine the curriculum, this would require an understanding of how sustainability curriculum paradigms would impact on the development of a marketing curriculum. This paper offered a new curriculum paradigm that could be used to understand the academic response to sustainability marketing.

Research Methodology

This paper seeks to make a contribution by invoking new ways of producing marketing knowledge. In particular, this empirical study offered insight into the sustainability-marketing curriculum through the innovative use of participant portrayals. This allowed new theorisations to be made about the sustainability-marketing curriculum and resulted in the creation of unique concepts and terminologies such as 'the sustainability marketing curriculum paradigms' and 'the sustainability marketing and curriculum redesign hierarchy'.

The sustainability marketing curriculum paradigms offered three new conceptions, namely: 'Curriculum Stagnators', 'Curriculum non-Traditionalists' and 'Curriculum Transformers'. These paradigms of sustainability marketing curricula were examined using thematic categories extrapolated from data analysis.

The thematic categories encompassed:

- *The sustainability discourse trend/fad;*
- *The skilling rhetoric;*
- *Restricted academic agency; and*
- *Student participation in curriculum development.*

The thematic categories and the new sustainability marketing curriculum paradigms were further abstracted to create a sustainability marketing consciousness hierarchy. This was done to expand knowledge in relation to sustainability marketing and the sustainability marketing curriculum. The sustainability consciousness element of the hierarchy offered that greater levels of sustainability consciousness would allow for greater efforts towards marketing curriculum redesign. The paradigm development and hierarchy construction was a contribution made to understand the context in which sustainability marketing could be constructed and overall marketing curriculum redesigned. These would be relevant to both the academic and corporate context in which marketing takes place.

Findings

The paradox between the Dominant Social Paradigm in existing marketing curricula and the 'provocation' for a socially responsive marketing curriculum such as a sustainability marketing curriculum was included as areas of enquiry in the participant interviews. Resultantly, the extension of this debate was facilitated through an understanding of the historical context of the development of marketing theory and the use of the theoretical and conceptual framework of the academic response to marketing by Arnold and Fisher (1996). Therefore, the participants' accounts were displayed utilising a metaphorical lens in the form television screen imagery to represent historical eras in marketing theory development, television programme channels to

represent participant's paradigmatic orientation and television programme contents to represent the individual participant voices. Hence, the participants were portrayed as "*The History Channel: The Apologists*", "*The Business Channel: The Social Marketers*" and "*The Discovery Channel: The Reconstructionists*".

The data findings from the participant portrayals were further abstracted and resulted in the creation of a new curriculum response to marketing sustainability through the proposition of three new sustainability marketing curriculum paradigms. The new sustainability marketing curriculum paradigm responses have been entitled "*Curriculum Stagnators*", "*Curriculum non-Traditionalists*" and "*Curriculum Transformers*". Additionally, this study proposed four different thematic categories in the understanding of the new curriculum paradigms namely: "*The Sustainability discourse trend/fad*; "*The Skilling rhetoric*"; "*Restricted academic agency*" and "*Student participation in curriculum development.*

This resulted in three Meta themes which were used in the conceptualisation of a "*Sustainability consciousness and curriculum redesign hierarchy*". The hierarchy suggested that higher levels of sustainability marketing consciousness would encourage marketing curriculum transformation and redesign. In so doing these new theorisations (sustainability marketing curriculum paradigms and the sustainability marketing consciousness and sustainability marketing curriculum redesign hierarchy) have advanced knowledge in the field of marketing theory and could potentially be used in the formulation of new marketing knowledge and marketing curricula. Additionally, the advancement of knowledge in the field of marketing can be extended through the recommendation for future research in suggested areas such as student perspectives of sustainability marketing in the marketing curriculum, academic agency and competencies in sustainability marketing and pedagogical approaches to teaching sustainability marketing in the South African context.

Recommendations

This research study opens up the conversation on sustainability marketing in the marketing curriculum which would justify the need for future research. In particular, more research is needed to understand and interrogate student perspectives about marketing sustainability and its relevance to the marketing curriculum. Further investigation into the role of the corporate players in the development and construction of marketing knowledge in marketing curriculum generally and sustainability marketing in particular would be useful.

This study has revealed that marketing sustainability comprised a more actionable component of marketing strategy in practice as opposed to being a component of academic marketing theory. Also, the skilling rhetoric in marketing practice and academic marketing theory should be investigated further to consider how students could become acquirers of new forms of marketing knowledge.

This study has also revealed the importance of developing skills and competence in the area of sustainability marketing. To this end, more research would be required in understanding academic competence in the field of marketing sustainability and how these competencies can be developed. Following from this, the need to consider pedagogical tools in the delivery of sustainability marketing curriculum content would need further examination.

The processes and structures involved in curriculum design would also need further probing and examination. A primary concern would be in how the curriculum design or even redesign would unfold. Research that would focus on who is responsible for the design and construction of marketing curriculum could provide clues into how new forms of marketing knowledge could

emerge. Hence, further research that includes business schools, public and private higher education institutions could prove useful in this process.

The marketing sustainability paradigms revealed in this study can be further explored and applied to other academic and cross-disciplinary contexts to reveal how sustainability may be relevant to a 'whole-university' approach to implement sustainability initiatives. Additionally, the idea of 'marketing sustainability consciousness' can be further unpacked and explored in terms of its meaning and relevance to redesigning marketing curricula. So, this paper suggests that sustainability marketing would be a relevant discourse that requires further interrogation to uncover how it may be constituted as a part of marketing theory and ultimately, represented in the marketing curriculum.

Borin and Metcalfe (2010) emphasised social intrapreneurship that focused on sustaining social needs. They have also built on the work of (Bridges & Wilhelm, 2008) by providing specific materials that can be incorporated into a marketing sustainability curriculum. These authors have considered the six learning types of Fink's (2006) taxonomy and have attached twenty one marketing applications to these learning types all within the context of the 4Ps in marketing.

Sustainability in higher education institutions tends to be promoted through green initiatives or through promoting sustainability education. Greening can be considered to be a more action-oriented approach and does not meet fully with the holistic requirements of sustainability education to include a wider community of stakeholders. This has meant that EfS has been marginalised and remains discipline oriented and situated in the fields of environmental education and natural sciences (Savelyeva & McKenna, 2010).

Keywords: curriculum paradigms, sustainability marketing curriculum, "sustainability consciousness and curriculum redesign hierarchy", Critical Marketing Research.

African Sustainable Entrepreneurship Perceptions: A Case of Pietermaritzburg SMMEs

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As increasing global expansion and international competition unfold, both in the industrial and commercial sectors, it is imperative for large corporates as well as Small, Micro and Medium-Sized Enterprises (SMMEs) to develop sustainability plans for present and future developments. Researchers have agreed on the importance of entrepreneurs for the economic development of a country. Despite their constructive contributions on economic development, entrepreneurial activities have also led to environmental degradation. Thus, it is believed that environmental issues should be solved by entrepreneurs themselves. In recent years, linking entrepreneurial activity and sustainable development has become an essential practice for all businesses nowadays (Koe & Majid, 2014). Dean and McMullen (2007), suggest that entrepreneurs should help resolve environmental problems. Linking economic and environmental interests to create benefit for the whole society has become a vital practice among businesses nowadays (Palazzi & Starcher, 2006). Businesses are required to perform in an equal footing between economic gains and sustainable practices. Being "green" and being "economically successful" should be at the central attention of all business leaders today (Schaltegger, Synnestvedt, & Vei, 2001). Economic gain is no longer the only objective of entrepreneurship. Due to the increasing awareness and rapid development of concepts related to Corporate Social Responsibility (CSR), ecological modernisation and sustainability development, many businesses have re-examined their roles on social-economic issues. In many cases, the term "corporate sustainability" is a synonym for "CSR" (Hall, Daneke, & Lenox, 2010). As such, adopting sustainable practices is not only a trend but also a must, for most current entrepreneurs. In South Africa, entrepreneurs of large corporates and SMMEs are striving to develop new ideas and processes for their ventures in order to sustain their current position in the future (Belz & Binder, 2017; Sarango-Lalangui, Santos, & Hormiga, 2018). Limited research has been conducted on the intention of practising entrepreneurs, specifically among owners of SMMEs towards sustainable entrepreneurship (Koe & Majid, 2014). Previous studies focused on a traditional entrepreneurial process, with limited studies having been done to investigate the intentions of entrepreneurs to engage in sustainable entrepreneurship. To date, studies by Moriano, Gorgievski, Laguna, Stephan, and Zarafshani (2012), Shook and Bratianu (2010) and Schwarz, Wdowiak, Almer-Jarz and Breitenecker (2009) on entrepreneurship intention have captured the attention of multiple researchers in the entrepreneurship field. However, studies focusing on intention towards sustainable entrepreneurship are still lacking, especially in the local setting (Koe & Majid, 2014). Not much has been known regarding the antecedents of intention towards sustainable entrepreneurship in South Africa (Belz & Binder, 2017; Koe & Majid, 2014; Nhemachena, 2017). Studies conducted by Wahga, Blundel, and

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Schaefer (2018), Gasbarro et al., (2018), Dhahri and Omri (2018), Kraus, Burtscher, Vallaster, and Angerer (2018), and Hörisch (2018) have successfully explained how entrepreneurs practice sustainable entrepreneurship and what their contributions are. Unfortunately, the psychological aspects, such as intention and motivation that drive people towards sustainable entrepreneurship, have not been adequately addressed in the current literature. Despite the growing field of sustainable entrepreneurship, most of the available literature has been mainly theoretical and qualitative, or has focused on developed countries, and very little has been done in developing countries such as South Africa (Nhemachena, 2017). Therefore, to address this research gap, the objective of this paper was to investigate what motivates entrepreneurs to engage in sustainable entrepreneurship. The Theory of Planned Behaviour (TBL) model was used as a framework to evaluate the entrepreneurial intentions of entrepreneurs towards sustainable initiatives. The study made use of a quantitative research method based on a positivist research paradigm in the form of a structured survey questionnaire. The results and findings were generated from a sample size of 234 respondents. The data was coded and analysed using SPSS. The study used Cronbach's Alpha to evaluate the validity of the results. The test of the factorability of the scale items into specific factors was based on exploratory factor analysis, and the items were found to relate to the respective scales. The Exploratory Factor Analysis results indicated that the motivations of sustainable entrepreneurship in Pietermaritzburg, South Africa could be factored into four dimensions: business case, moral case, stakeholders, and society. The results revealed that the entrepreneurs intention to adopt sustainable practices were mostly influenced by the pressure they felt from their customers, investors, society, employees and colleagues, and their attitudes about sustainability. The results further indicated that attitude was the most critical determinant of the intention of entrepreneurs to engage in sustainable entrepreneurship. The findings showed that owners of SMMEs showed an encouraging level of intent towards sustainable entrepreneurship. They favoured sustainability and were optimistic about being sustainable in their business activities. This optimism towards future sustainability could be considered as a promising outcome as it could support our country's development agenda in building a sustainable society. This study provided insights to both literature and practice. In terms of literature, it enriched the entrepreneurship literature by providing insights on the intention of entrepreneurs towards sustainable entrepreneurship in Pietermaritzburg. Practically, this study stressed that businesses of different sizes did react differently to sustainable entrepreneurship. Thus, different policies, practices and strategies should be drafted to cater to the diverse needs of SMMEs. Research on the motivations of sustainable entrepreneurship could be broadened by undertaking a nationwide study to understand better the drivers of entrepreneurial behaviour related to sustainable entrepreneurship across the country.

Keywords: Entrepreneurs, Perceptions, Small to Medium, Sized Enterprises, Sustainable Entrepreneurship, Theory of Planned Behaviour

Mechatronic Solution Based on Bionics for the Remedy of the Health Problem No. 1 by Means of Sustainability

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What is the Problem?
The detailed name of the health problem to be solved is: Back problems due to lack of movement and the associated bad posture while sitting

This "widespread disease No. 1", which also is closely related to stress and cardiovascular diseases, affects more than 70 % of the population in the industrial nations of the world - with rising tendency - people who spend many hours of the day sitting at their workplaces (in office chairs, truck seats, or in wheelchairs, etc.). In addition, more and more young people are suffering from back pain, and because of demographic change, older people too.

However, back problems of dependent employees are far better documented than those of young people, the self-employed, wheelchair users, elderly people in retirement homes or at home – bedridden or not - plus patients in clinical facilities.

In Germany alone, twelve million people work in a sitting position, that's 80,000 seat hours per person per working life, which makes these back problems the most common cause of absenteeism with 40 million sick days and an economic loss of more than 48 billion euros - every year.

According to my thesis: The detailed name of the problem contains the solution, this is:
To impress movement to the pelvis with an associated upright body posture while sitting

The movement of therapy horses is now offered in fitness centers by motorized saddles with the quite violent horse gait (walk, trot and gallop). These saddles are therapeutically effective "passive" solutions (the pelvis of the seated person is moved), but due to the lack of a backrest they are no seating (and therefore not allowed in workplaces).
Also hiking (persevering walking), our oldest and most familiar mode of locomotion is a "passive" movement, here the pelvis is moved by the own legs "in ones own gait". However, walking should interrupt the work process, because movement missed during the day can not be made

*Speaker

up in the evening - so the number of those affected does not decline.

Background of the invention:

A walking person (moving the pelvis by ones legs) will hold the upper body perfectly upright equalizing the pelvic movement automatically and unconsciously with the entire trunk musculature in order to keep head, shoulders and thus the hands still.

When a person's pelvis is being moved by a horse's back when riding (passive movement), the effects for the upper body are identical. Yet the movement of a horse's back (in horse gait) is unnecessarily intensive.

The pelvic movement in the individual, human gait pattern causes an active but completely unconscious compensatory movement through the entire trunk muscles in forcibly upright upper body posture to keep the shoulder girdle and head and especially the hands steady to work with, being moved preferably more than half an hour every day.

This compensatory movement promotes blood circulation and thus the supply of oxygen, including to the brain, supports digestion, reduces bone degradation, prevents and eliminates the tension of the back- and the slackness of the abdominal muscles, trains the spinal column support muscles and nourishes the intervertebral discs plus with a proven sentiment (better mood by the passive, rhythmic movement)

According to the "Flow Study" by Prof. Mihály Csíkszentmihályi, "Rhythm should integrate thinking, feeling and acting and this integration should bring about" flow ", i.e. good mood.

Why is it important?

With so many people affected and no remedy available on the market this could be the right time for an important innovation. There will never be a nicer and more familiar movement which one can have imprinted on the human pelvis while sitting.

Trying to relieve pain, for example through pills, injections, ointments, patches, applying heat or cold, chiropractic, physiotherapy, acupuncture, massage, Fango even cupping is no susstainable solution - and there are still far too many unnecessary Intervertebral disc operations (Discectomy).

What did you do?

It has been proven that the appearance and function of the human back, as an important part of the musculoskeletal system, is an adaptation to the persevering walking on two legs, the human body shape being a result of this selection process. (Hoffmann, 2001, Witte et al., 2002)

Thus, it was known "what the human back does when a person is walking or horse riding (the entire trunk musculature compensates the pelvic movement to keep the head, shoulders and hands steady), but it was still necessary to explore "how" the legs of different individuals move the pelvis in their own gait and "how" a drive module for an individual user can be set to his gait without having to send each individual "costly" and "time-consuming" to a gait laboratory at a university for gait analysis. This way a gait can be determined for a person, that doesn't have a gait.

So together with three universities I participated in the BMBF competition, by winning we were able to carry out the following experiments to answer these questions:

Subexperiment a

Can the individual pelvic movement of the gait pattern of people who do not have a measurable gait pattern be determined on the basis of their biometric data?

To verify my hypothesis: "The gait kinematics of the pelvis correlates with body measurements," anthropometric data were recorded and gait analyzes on 106 subjects were performed on a Treadmill in the running lab Jena (KIP) (Basic research)

Subexperiment b
Which of the available drive principles can produce the pelvic movement of the corresponding gait pattern in three directions of movement on the seat and imprint it on the seated person?
There is a self-tempered movement model and a professionally built prototype.

Subexperiment c
Is this movement reasonable for the persons concerned?
With the prototype of the chair a clinical study on tolerability on patients suffering from back pain was carried out at the FSU-O Hospital (with the approval of the Ethics Committee for human experiments).

What did you find?

Chairs for "active" sitting (where the occupant can tilt the seat "actively" with his buttocks and on which one can sit definitely with a crooked back) are the most common office chairs that are now offered by all major office furniture manufacturers. They provide no real movement - so the number of back pain sufferers does not decline.

However, such "active" office chairs have an important advantage: the tilt mechanisms are so high-build (from the upper end of the gas spring to the underside of the seat) that they could easily be exchanged for a mechatronic drive module to move the seat in a human gait.

Modern truck seats have "devices" for the detection of microsleep but no solution that can keep the driver awake until the next parking opportunity (in case of fatigue, only sleep helps).
A truck seat equipped with a drive module according to my invention can save vehicle, cargo and life(s).

Chairs with backrest and with a massage or vibration functions are seating, but without therapeutic benefits (and may therefore only be advertised as wellness items).

People are becoming more and more "mobile", which pertains to the means of transportation and not to the state of their body. Not only do they sit many hours at work but also on the way from and to work in public or private transport, they are sitting at meals, sit when watching TV, sit at home on the couch and sit when traveling. Since some decades people even shop while sitting.

And soon, people will travel to Mars and in zero gravity they don't want to run on a treadmill (walking belt) like astronauts do in the ISS but sit in a chair while being moved.

What do you recommend?

First of all, I wish that my abstract be accepted and that I have the opportunity to present the movement model to my invention and thus to prove my statements on its effect, while I write explanations in mirror writing on a pane of glass. Of course, I would like to make the chair available for "test sitting" too.

In an increasingly interconnected world, there will be more and more digital transactions and even more people will be sitting at computer workstations. I would like to call my attention to an international company with many employees at computer workplaces, who also work in their development department with "new work" and "change" and in addition I wish to get invited to demonstrate the prototype of my invention and I can inspire this company to develop and manufacture the required drive module so employees can work with healthy backs and good spirits.
I believe, that more and more people have the chance to work together on IT solutions from their computer workplaces at their home office and so under the aspect of sustainability use shared creativity to create disruptive innovations in teams, and maybe an improved digital infrastructure could even reduce private travel.

Keywords: bionics, human gait, locomotion, sitting, moving seat, health, lack of movement, mechatronics

The impact of mobility business model innovations on the sustainable development of the transport sector – A systematic review. - Work in progress -

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1. Motivation: The transport sector in a state of transition, bringing forth mobility busines

The transport sector is in a state of transition, which is driven by several developments: The decarbonisation targets imply significant efforts by the transport industry to reduce greenhouse gas emissions in the next decades to come (IPCC, 2014; SLoCaT, 2018). Tightening emission performance standards impact the automotive industry, because of its predominantly combustion engine-based product portfolio. Mobility needs and demands of people, particularly in highly urbanized areas, increasingly change. At the same time, urban development and infrastructure planning policy shifts away from the car-friendly paradigm to a more human-centric approach, leading to conflicts over the limited transport infrastructure space in major cities (Curtis *et al.*, 2019). Meanwhile, meta-trends like digitalization, platform economics, automatization, and industry 4.0 open up opportunities for intermodal, shared, on-demand, and smart mobility concepts, entailing disruptive potential (Cohen-Blankshtain and Rotem-Mindali, 2016; Dhawan *et al.*, 2019). Innovations such as the electrification of motor vehicles and autonomous driving technologies become more mature, slowly leaving the niche segment and gaining market shares. Ultimately, transport policy and regulation have become politicized, contested, volatile, and intertwined with other policy considerations, which affects the transport industry and its business models dependent on stable and predictable regulatory conditions (Canzler and Wittowsky, 2016).

In response, the global transport industry innovates new business models in order to offer new services and products as well as to adapt to a changing business environment and framework conditions. The diffusion of ridesharing and ridepooling services in major cities or the roll-out of micro-mobility products like bikesharing or electric scooter sharing illustrate this trend (Arnold *et al.*, 2018). Intermodal business models increasingly spread out and bring together still very distinct branches of the sector, like the automotive industry and public transport companies. Furthermore, new urban logistics concepts such as cargobike providers for parcel delivery arise, which are aimed at more effectively pooling cargo loads and delivery routes in order to reduce congestions and emissions in cities. Moreover, companies from other distinct sectors like the electricity industry now enter into the transport sector, as business models around the smart

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charging of electric vehicles and their potential to balance the electricity system elucidate.

2. Problem: The sustainability impacts of these mobility business model innovations

In recent years, a plethora of definitions, concepts, and typologies has emerged to capture the sector-wide shifts and corresponding business model innovations (compare Yang and Evans, 2019 among others): Various and sometimes overlapping conceptual definitions such as Product-Service-Systems (PSS), Mobility-as-a-Service (MaaS), Mobility-on-Demand (MoD), and shared mobility highlight the unclear operationalization, which can be a stumbling block to fully grasp the innovative features of these business models. A point of commonality of these conceptual definitions is the underlying assumption that the promotion and upscaling of these business model innovations will significantly contribute to a more sustainable development of the transport sector. It is assumed that these innovations would constitute sustainable business models as such, since they would enable companies to sustain and create new value, while creating positive environmental and societal impacts onto the transport sector in the long-run as a whole (compare Stubbs and Cocklin, 2008; Boons and Lüdeke-Freund, 2013; Boons *et al.*, 2013; Wainstein and Bumpus, 2016; Schaltegger *et al.*, 2016). These business models would provide more socially equal and just access and more effectively meet the mobility needs of people (Etter *et al.*, 2019). For example, Liyanage *et al.*, 2019, p. 1262 argue that access to mobility rather than to car ownership will enable customers to be more selective in choosing from the door-to-door mobility services offered by mobility operators for intercity, suburban as well as last kilometre‘ travel solutions. Moreover, these business model innovations would lead to more efficient provision and shift demand to less resource-intense means of transport (compare Goldman and Gorham, 2006; Frenken and Schor, 2017; Firnkorn and Müller, 2011). Henceforth, Valsecchi Ribeiro de Souza *et al.*, 2019 infer in their literature review that urban mobility business model innovations would maximize the use of transport resources and capabilities, encourage substitution using more sustainable modes, and reduce travel demands.

However, these assumptions on the beneficial sustainability impacts of these mobility business model innovations have increasingly become contested. Some studies indicate that the negative ecological and societal impacts of these business models are often not thoroughly taken into account, suggesting that they are rather detrimental to the sustainable development of the transport sector (compare Suatmadi *et al.*, 2019). For example, recent analysis prompts that electric scooter sharing in Germany is limited to tourism segments and does not reduce ownership of motorized vehicles, instead rather cannibalizing public transport demand (Civity Management Consultants, 2019; Schellong *et al.*, 2019). Of primary importance are the prevalence of rebound effects, by which the expected efficiency and substitution gains of these innovations are offset by additional, induced travel demand or other behavioural adaptations or systemic responses (Font Vivanco *et al.*, 2015; Jung and Koo, 2018; Jones and Leibowicz, 2019). Hence, distinguishing between direct and indirect rebound effects and taking into account the perspectives from different disciplines to account for these rebound effects, as suggested by Walnum *et al.*, 2014, is particularly important for the methodological appraisal of these business model innovations. Consequently, Wittstock and Teuteberg, 2019, pp. 68 & 70 conclude in their assessment of Mobility-as-a-Service schemes that their potential contribution to a more sustainable mobility model is one of the main arguments for supporting this concept mentioned in both academic literature and public media, but the actual sustainability outcomes are highly uncertain.

3. Research focus and methodological approach

Therefore, this paper centres upon the two research questions:
(1) What is the impact of mobility business model innovations on the sustainable development of the transport sector?

(2) How are the sustainability impacts of these mobility business model innovations operationalized and empirically measured?
On the one hand, the aim of this paper is to systematize the state of research on the impacts of mobility business model innovations on the sustainable development of the transport sector worldwide. On the other hand, the aim is to evaluate the various sustainability impact assessment methods employed, in order to contribute to further operationalization and methodological appraisal. Consequently, the paper synthesizes the empirical insights and contributes with a critical review of the sustainability impact assessment methods, which are employed to measure rebound effects among other potential environmental, societal, and economic effects. The paper suggests future research avenues and provides recommendations on the decisive factors to be taken factored into the business model design in order to spur a sustainable development of the transport sector.

The paper is currently work in progress and will employ the method of a systematic review (compare Fink, 2014). Relevant, peer-reviewed journal articles and studies from common databases, which have been published from January 2005 until September 2019, will be analysed using qualitative content analysis (Finfgeld-Connett, 2014). The articles and studies will be analysed and coded between October 2019 and January 2020 against the backdrop of the empirical findings on the sustainability impacts of these business model innovations as well as the respective sustainability impact assessment methods employed.

4. Preliminary findings

Investigating the sustainability impacts of such mobility business model innovations and the employed assessment methods is ever more important because these business model innovations are seen as primary lever to achieve more sustainable mobility in the future. Lüdeke-Freund and Dembek, 2017 call for multidisciplinary and interdisciplinary efforts so that sustainable business model research can emerge as a vehicle to deliver the necessary change. Not surprinsigly, Lozano, 2018 critiques that conceptions of sustainable business models also focus too much on the environmental dimension and miss the systemic and holistic perspective onto societal impacts, time and spatial context dependency, and the influence of external stakeholders beyond the company. Indeed, a preliminary pilot review of the systematically selected articles and studies indicates a particular emphasis on the assessment of environmental impacts of these mobility business model innovations, such as the reduction of greenhouse gas emissions by free-floating carsharing or ridepooling services. Societal impacts like the exclusion of certain user groups to such innovations are less prominently measured and discussed. Moreover, the surrounding public policy and regulatory framework conditions are often not adequately recognized so that these business model innovations may contribute to more sustainable mobility (compare Creutzig *et al.*, 2019). Hence, designing and upscaling these business model innovations becomes highly challenging for both industry and public policy alike, if such sustainability trade-offs should adequately be factored into these business models.

Keywords: mobility transition, business model innovations, transport sector, sustainable business model design, sustainability impact assessment, methodological appraisal, rebound effects

Universities as a Place of Education for Sustainable Development - A Study by SDGs

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The day on which mankind has consumed the resources that nature can restore in a year is called Earth Overshoot Day" and represents a measure of mankind's resource dependence. This year it fell on the 29th of July - three days earlier than last year (Global Footprint Networks 2019). Publications such as the IPCC-Report emphasize the consequences of the preponement of the Earth Overshoot Day and the concomitant increasing imbalance between social, ecological and economic issues for natural and human systems (see IPCC 2018).
To counteract this imbalance, one approach is to strive for technological solutions in forms of innovations, but one of the main problems with sustainable" innovations is that the resource savings are overcompensated, which ultimately leads to higher resource consumption (so-called rebound-effect") (Lange 2018, p. 59). So it becomes obvious that there is an indispensable necessity for a social-ecological change. For this, both individuals and organisations should embrace their social responsibility and take the necessary actions (Dlouhá & Pospíšilová 2018).

Facing these challenges, sustainable development becomes a central construct. In summary, the construct stands for a collection of positively evaluated conditions and trends across a wide range of environmental, economic and social sectors to improve the economic and social living conditions of the individual without destroying the natural basis of life (Robert et al. 2005). By formulating 17 objectives – so-called sustainable development goals (SDG), the international community strives for securing and promoting this construct. On the basis of these SDGs, the impact and effect of sustainable measures can be operationalized (Diaz-Sarachaga et al. 2018). Furthermore, the goals "advocate that all learners will have the knowledge and skills needed to promote sustainable development" (O'Flaherty & Liddy 2018).

In the context of Agenda 21 and the SDGs, education is a key component and indispensable condition for the promotion of sustainable development (Combes 2005). Accordingly, Education for Sustainable Development [ESD] is a central action plan of the international community. In this action plan, universities are regarded as important actors at the national level and researchers and students are identified as essential addressees of the ESD.

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Consequently, universities and higher education institutions in general have a special role (Lozano et al. 2013). As institutions of research and teaching, they take up a role model and pioneer function (Müller-Christ 2014): On the one hand, they conduct research and teaching into different relevant field such as (technological) sustainable innovations and societal or economic to develop alternative concepts for a sustainable future. On the other hand, they are organisations themselves which have to shape their processes and overall performance in a holistic, sustainably way (Karatzoglou 2013).

Referring to this, Beynaghi et al. 2016 developed a model for the generation of "trend-based scenarios" for universities. The results indicate that the promotion of sustainability through social cooperation and various functions such as education, research and public relations will increasingly be a core task of universities.

4 years after the findings, these assumptions led us to study the university as an actor (or maybe even driver) in education for sustainable development. This highlights our questions: Is sustainable development an integral part of the core tasks of high-performing universities? Which SDGs are implemented in universities? Are universities a place of ESD?

We will not consider these questions on the basis of holistic single case studies of individual universities. According to a literature review by O'Flaherty and Liddy (2018) a primarily used method of investigation on this problem. We intend to gain a generic overview. For this purpose, we have a sampling of 467 universities at our disposal. These universities have provided information on different SDGs and we also have access to a ranking of their core tasks. Within the framework of multivariate statistics and descriptive statistics, we evaluate this data set.

This is a work in progress that will be completed in November 2019. Until now, there are no concrete results as the multivariate analysis has not been completed yet. But it could possibly be expected that there are connections between the overall performance of universities and at least some SDGs. So for example, there might be a link between the number of students per staff and quality education or between the student ratio of females to males and gender equality. In addition, it is conceivable that certain SDGs exhibit synergies with others: For example, there might be a link between good health and well-being and gender equality.

Besides the results concerning our research questions, we expect to gain knowledge about the handling of SDGs in the academic search process.

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Keywords: SDG, Education for Sustainable Development, Universities

2 layers of diversity: Interculturality and interdisciplinarity in the case of creating an e-learning course on sustainability in textiles across boarders

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1

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Sustainability is a term established in the 18th century by Carl von Carlowitz in forestry operations in the Saxonian woods and later developed in different contexts. Facing the danger of deforestation of Europe due to the industrialization and the processing of ore, chief mining officer of Saxony developed the concept of sustainability: He wanted to develop a concept for the cultivation of woods "without which the country in its forge [essence, existence] may not remain" (Carlowitz, 1713, translation by authors) so that future generations could use the woods and the land. He included also the importance and reciprocal impacts of the social, environmental and economic areas. Measuring our society and economy with those requirements our present life style becomes obsolete, especially in times of a climate crisis. "Sustain-ability" is about conservationism and thinking about long term processes. In order to do that we must change our lifestyles as e.g. ecological movements around the globe are demanding. At that point, nowadays strong innovative and creative forces are needed to enhance upcoming challenges, combining social, economic and ecological needs as they depend highly on each other.
To reshape present structures, we need to cooperate as during globalization societies and economies get interconnected. Decisions in one part of the world may influence people on the other side of the globe. For international cooperation projects new working methods are needed in order to profit from different perspectives.The design, findings and observations of BUF(T)UC, one example project for international cooperation regarding sustainability, will be presented in the following by members of the team to inspire future collaborations.

Project description

In 2014 the Rana Plaza disaster happened: The garment factory close to Dhaka, the capital of Bangladesh, collapsed killing 1135 garment workers. This tragic accident gained public attention and was the cause for a broad discussion about sustainability in the textile industry with special focus on worker's rights and safety. In addition to the social issues the textile industry is considered the second most polluting industry after the oil industry. Thus, the textile industry is one example showing the need for more sustainable actors on different levels.

*Speaker

BUF(T)UC project is a cooperation project between University of Technology Chemnitz (TUC) and BGMEA University for Fashion and Technology (BUFT), Dhaka. Topic of the project is sustainability in textiles and RMG processing. The project aims at transferring knowledge and didactic skills from Germany to Bangladesh by revising the curriculum and training BUFTs teachers. Among other measures TUC develops an e-learning course for BUFT. The goal of the course "Sustainability in the textile value chain" is to give a holistic overview about sustainability along the entire textile value chain.

The course begins with a theoretical overview about sustainability and gives criteria for sustainability. It covers the entire textile processing chain (design, fibers, different processing steps like spinning, knitting or weaving as well as dying, printing and finishing) closing the chain with a chapter on recycling to a circular economy. Additionally, it deals with topics of marketing, management, international laws and regulations.

Therefore, knowledge from the following disciplines needs to be covered: Textile technology, chemistry, economics, philosophy, sociology, politics and international relations and law.

Apart from the knowledge, conducting the project requires a set of soft skills in the team: Computational science for handling the e-learning software, didactics and media psychology for creating a good learning environment, media communication and design to care for the look of the course and intercultural communication and competences for the communication among the project partners.

BUF(T)UC is coordinated by a person with knowledge in cultural studies and computer science. The team for the e-learning course started with competences in media communication and educational studies. Soon more textile engineering related skills were needed and thus textile engineers joined the team. Additionally, a media psychology student was needed to ensure a good learning system. As the team could not cover all the topics needed, external expertise was sought from an economist and a chemist.

As the structure of the team shows, interdisciplinarity was needed at two levels: during the realization of the project and for the creation of the content of the online course. As the course is about the implementation of sustainable methods, it influenced the design of the project and vice versa. Through the project the team gained expertise in international, intercultural and interdisciplinary cooperation, development cooperation and sustainability education. The key findings will be presented in the following.

Example of interdisciplinary co-working

As explained before, the creation of the content of the e-learning and the design of the project are strongly interconnected. This example shows how textile expertise and communication studies where coming to conclusions about sustainability in international contexts.

Textile experts from both countries provided knowledge of more sustainable production methods as a base to the project. They can also highlight the complexity and the differing local situations in the implementation process. For example, organic cotton is more harmful for Bangladesh than textile produced of locally produced non-organic cotton, as organic cotton normally has to be imported normally from Africa and can't be taken from closer production areas, which is influencing the job opportunities in both regions. In the dying process more aggressive chemical processes than for non-organic cotton are often needed. This example shows, that in the implementation of sustainability, the different local circumstances and chain reactions should be considered.

Comparing the proposals for the e-learning chapter "Definition of sustainability" from the German and Bangladeshi university with a tool from discourse analysis (Keller 2011), different approaches become clear. The word categories in the Bangladeshi concept are closely tied to challenges (such as water pollution in the dying process or energy consumption) and solution approaches in the textile production. The German input is more focused on the theoretical background, like different kinds of capital and the underlying motivations and value concepts.

Findings of the two disciplines concluded, that local peculiarities and global interrelations must be taken into account in the implementation of sustainability. As this example shows, matching the findings of two approaches became crucial for further communication in the project and the contentual designing of the e-learning, where the sustainability concept as well as its implementation are presented. This is one example that shows, how different disciplines contribute essentially to the success of the projects.

Intercultural communication From the intercultural perspective, the biggest challenge was to develop the course according to the needs of Bangladeshi textile engineering students. The intercultural communication challenges occurred on two levels: In the direct communication with the Bangladeshi staff and while creating the course for the Bangladeshi target group. The sensibility for Bangladeshi culture and learning style can be considered as rather low, as only a part of the German team had contact with BUFT staff during workshops in Chemnitz and got an insight into the culture during a visit in Bangladesh, while the others had no contact to Bangladeshi culture.

The direct communication with BUFT partners mainly took place via was mainly via e-mail or conference calls as well as direct communication during joint workshops. While agreements worked most of the time during the workshops, communication at some stages did not lead to the expected results. In order to adapt the course to BUFT student's needs, BUFT members were asked by TUC to give feedback on the courses. Instead, BUFT provided TUC with own course material.

From different qualifications of the staff of TUCs e-learning team, some conclusions can be made regarding the distribution of skills needed for creating an online course. Approx. half of the team members were working on creating content and the other half's task was to revise the content and implement it on the e-learning platform. This already gives a picture of the balance of knowledge and didactic skills. While one of the members who was in Bangladesh revised the lessons done by someone without the intercultural contact, a third dimension came into focus: The cultural context. The module was created from a German perspective. Some of the text and media did not seem to fit into the reality of Bangladesh (for example pictures showing only white people in short clothing). This revealed a void in the project team in regards of experience with Bangladeshi culture. Without the feedback of BUFT another position would be needed to "translate" the course to meet Bangladeshi culture.

To sum it up, textile industry is facing big changes and challenges in the future as one of the most polluting industries. Creative innovation is needed in all steps in order to implement sustainability persistently and in an extensive way. International cooperation and e-learning can be a way to lower the barriers, as a tool editable and accessible from all internet providing places and times.
The Case study shows that interdisciplinary and international cooperation emerged multiple concrete findings on the implementation of sustainability in the e-learning module but e.g. intercultural differences are obstacles to overcome. This Case study hopes to address future project partners to learn from the presented experience.

Keywords: Sustainability, interdisciplinary teams, Communication, Asia, Textile, Bangladesh, Case Study

6. Engineering, Technology, Supply Chain and Knowledge Management in the Era of Digitalization

What place for man in industry 4.0? (extended abstract)

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What place for man in industry 4.0? (extended abstract)
1+2 Problem and motivation for our research

The *comprehensive literature review presented in the full version of this article develops the following ideas.*

I The 4th industrial revolution is underway. According to Schwab (2016), it is a continuation of the digital transition defined by three converging movements: a permanent mobility, the integration of technology, and artificial intelligence. The concepts of "**industry 4.0**" or "**smart factory**" correspond to a new way of organising the production means in this context. It is affirmed as the convergence of the virtual world with the objects of the real world (cyber-physical systems). In terms of automation, it is characterised by the implementation of sensors (connected objects) within the logistics and production chains for data acquisition and control (SCADA). These sensors allow robots in the chain to dialogue and adapt tools to different needs (production modification, maintenance, etc.) The great promise of industry 4.0 is to attract consumers with personalised products (mass customisation) while maintaining gains on low manufacturing volumes (smart production) (Shellshear, Berlin and Carlson, 2015). Industry 4.0 is also a lever for customer-driven supply chain dynamics and industrial relocation (Gaudron and Mouline, 2017). These innovations are transforming current industry business models and creating new ones (Arnold, Kiel and Voigt, 2016). New strategies for designing intelligent plants allow them to become more flexible and responsive. The technological, economic and social implications of this revolution are numerous (Oesterreich and Teuteberg, 2016).

II Technological changes

A)Computer and industrial systems....

Information is the foundation for the practical transformation of existing plants into intelligent plants. Cloud computing, big data and artificial intelligence optimise decision-making (Gierej, 2017; Greenfield, 2016). The Internet of things allows objects equipped with sensors to communicate with each other and take action based on the data collected and analysed. The permanently connected networks establish a link between the real world and the digital world. New plants based on these technologies can adapt to many predictable and random factors through the constant analysis of data and performance indicators.

*Speaker

B)...In the service of production and logistics

In the intelligent plant, the installation of sensors throughout the production line makes it possible to be constantly alerted in the event of errors or malfunctions that can then be processed very quickly and thus improve quality control (Lin et al., 2016), or to conceive strategies to prevent interlocks and simulate their effectiveness (Wang et al., 2016). This leads to increased performance (Kocsi and Olah, 2017) and improves the ability of plants to adapt to so-called "stress" economic situations such as fluctuating demand (Hwang et al., 2017). It is really a question of making an incremental evolution in production processes and "architectural" changes in the way of thinking about the product (Prause and Weigand, 2016). In logistics, real-time stock management allows managers to maintain an optimal stock at all times. Here too, thanks to intelligent and continuous flow analysis, it is possible to react instantly and thus prevent problems that may arise throughout the supply chain (Hirmer et al., 2017).

III Implications for employees and jobs

A)New human-machine interactions

Industry 4.0 leads to an interaction between the material world and the virtual world (Götz and Jankowska, 2017). Current processes must migrate to interconnected and virtual systems (Szozda, 2017), and people must learn to cooperate with these technologies. This intra-company collaboration that links human and machine interactions can be seen as a new form of "intelligent connectivity". Breakthrough technologies such as artificial intelligence are an opportunity to elevate the machine to the same role as man and to create new forms of human-machine interface that increase the efficiency of production units. Industry 4.0 is based on interoperability between human actors and machines capable of adaptation and regulation. The main challenge for industries is to develop this potential for cooperation between man and machine (Mulford, 2017). A human-centred approach to industry 4.0 and its integration into production and information systems should allow for more efficient processes in terms of controls and automation (Pascaux-Lemoine et al., 2017).

B) Evolution of jobs

Industry 4.0 poses the problem of "technological unemployment": robots capable of performing chain tasks with high efficiency and adapting to many situations threaten jobs, particularly low-skilled ones (Magruk, 2016). In the coming years, the job market will have to undergo a major evolution in order to adapt to the needs of the new plants and their organisation. New types of jobs will also emerge, linked to new needs and mobilising technical skills related to digitisation. Brandas and Ciprian (2016) refer to the "intelligent labour market" as the workforce, skilled or unskilled, will no longer simply operate a task within a production or logistics chain but will truly interact within a global system composed of machines, people and information ; this workforce must be flexible and able to adapt to tasks or needs, just like machines.

C)Evolution of employees' skills through training

Employees' skills must be increased through training (Schuster et al., 2015). In this sense, public policies must change education and learning systems that are not in line with increasingly autonomous and automated factories (Peters, 2017). It would be ideal, for example, to train the youngest students from the beginning of their studies through an observation internship or work-study contracts. Universities also need to better prepare students for this future (Eberhard et al., 2017). Finally, companies must set up vocational training programmes adapted to short and long-term needs. Skills transfer is a major challenge for industry 4.0 (Gorecky,

Khamis and Mura, 2017). As the industries' business models have been profoundly modified, the way employees are integrated into the new links in the value chain will represent a core and sustainable trend (Baldassari and Roux, 2017).

Many industrial groups have already invested in technological innovations for the design and construction of new intelligent and connected plants. In terms of research and reflection, a certain amount of guidance is already available, particularly concerning the integration of new technologies into logistics and production systems, the benefits related to industry 4.0, enhanced by successful use cases. But the literature also suggests that a number of efforts still need to be made to make industry 4.0 a reality. The first concerns the way to connect man to machines: machines will no longer simply be a tool for employees but truly an essential partner in the production chain. The second effort consists in rethinking the place of man in these increasingly complex automated systems: indeed, as its importance is likely to diminish, its main assets will have to be highlighted. Today, there are still uncertainties about the place of man and the future of occupations in this new industry. We are part of this approach by formulating the following research problem: **"What place for man in industry 4.0?"** and subsequent research questions:

- **"What are the new human-machine interactions at work in industry 4.0?" (RQ1)**, centred on cooperation between man and machines,

- **"What are the mutations of the occupations induced by industry 4.0?" (RQ2)**, focused on the evolution of the occupations and the way of working.

3 Empirical studies

To answer the stated research problem and questions, two studies were conducted. In both cases, only respondents working in "4.0" industries were targeted.

First, an exploratory quantitative study aims to get a concrete idea of the transformations induced by industry 4.0. The survey questionnaire includes 32 questions divided into two sections around the topics of human-machine interactions and job transformation (plus an information section on the company). For its distribution, we have activated our network of professional contacts, reached new targets corresponding to the sought profile on Linked and by emails, and distributed the questionnaire within digital professional networks/groups dedicated to "industry 4.0" or "smart factory". 108 professionals responded to our survey.

Then, a confirmatory qualitative study helps to specify the impacts of these transformations on working conditions and occupations at the three usual hierarchical levels of the company: director, manager, and employee/operative. The objective is to identify the transformations at each level. So, at the end of our questionnaire survey, we contacted again selected respondents (industries representative of their sector of activity) to conduct interviews at the three desired hierarchical levels. The interview guide includes 15 questions on the same topics (also information questions on the company and the respondent). We could make 14 interviews, mostly by Skype or telephone due to geographical distance.

The questionnaire survey was carried out in August and September 2019 and its results were processed end September. The interviews were conducted in October 2019 and the responses were analysed end October. All survey material can be provided upon request.

4 Summary of findings

The conducted *quantitative and qualitative studies are developed and discussed in the full version*

of this article.

Regarding **RQ1: "What are the new human-machine interactions at work in industry 4.0?"**, our studies reveal that new technological tools have been implemented in the various industrial units.....
(see the rest of this article, i.e. of our findings, conclusion, recommendations, and the bibliography in the attached file)

Keywords: Artificial intelligence, big data, cloud computing, connected objects, digitization, employee, job, human, machine interaction, industry 4.0, Internet of things, logistics, man, production, skills, smart factory, smart production, technology, training

The digitalisation of the supply chain: new practices to face new challenges

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The supply chain is strongly impacted by digitalisation and is at a turning point in its transformation. To help supply chain actors in their strategic and operational choices, we review the challenges of digitalisation in the different supply chain activities and assess the level of maturity of the main actors in our region (Lorraine region in France) through a questionnaire survey from which we expect at least a hundred answers in the end. After analysing these feedbacks, we hope to contribute with our recommendations to refining the supply chain digitalisation movement: with a clear vision and a complete technological base, supply chain actors will be able to continue their global digitalisation process and concentrate their investments on "useful" IT and physical innovation.

Keywords: Supply chain, digitalisation/digitisation, digital transition/transformation, strategy, operations

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Cybersecurity of industrial systems: a misunderstood field of growing importance (extended abstract)

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Cybersecurity of industrial systems: a misunderstood field of growing importance (extended abstract)
1 Research problem

This article discusses cybersecurity in the real world using industrial systems as an example. Indeed, industrial systems have seen the advent of IT (information technology) tools on a massive scale and the interconnection of networks, and these systems are generally still not very secure today. The *comprehensive literature review presented in the full version of this article* develops the following themes.

Industrial systems and their components

An industrial system is a set of physical and cybernetic equipment used to provide a service, such as building management (technical management in terms of light, energy, doors, access or other), energy or product production (which can be chemicals, goods, materials -we can think particularly of factories), or transport (which can be road traffic control for example or the management of rail systems such as metro, trains or maritime transport; energy transport also represents a very important part of industrial systems today) (Alcacer and Cruz-Machado, 2018; Clarhaut et al., 2015). In general, an industrial system includes a control part that sends commands to the system that will make the decisions, and an operational part made up of sensors and actuators that are linked to the physical system. In order to set in motion the operative part, energy must be supplied externally. The link between the control part and the operational part is made through a network, which allows orders to be sent down to the operational part and reports to be sent back once the actions have been carried out. The industrial system is controlled by an Industrial Control System (ICS) (Sindjui, 2014)..

Industrial networks

According to Sindjui (2014), traditional decompositions such as the CIM (Computer Integrated Manufacturing) pyramid break down the manufacturing industrial system in several levels according to the functions performed at each of these levels:

- level 0 (lowest level) includes the machines, sensors and actuators seen above,

*Speaker

- level 1 comprises the cell containing the automaton and a set of sensor-reactors,

- level 2 contains the (manufacturing) workshop, which is composed of the different cells and coordinates them,

- level 3 features the factory, i.e. a set of workshops,

- level 4 designates the enterprise, made up of a set of factories; IT processes at the enterprise level allow human resources management, planning management, etc.

This breakdown distinguishes two different networks in companies (see figure 1): the level of information technologies called IT, and the level of operational technologies called OT. These two networks are separated by the SCADA data acquisition system. All networks related to business management are at the IT level, i.e. levels 3, 4 and 5. The OT level uses classic computer networks for communicating between programmable logic controllers (PLCs) at levels 1 and 2. Level 0, the field level, allows sensors and actuators to be connected to PLCs.

Figure 1. Breakdown of an industrial network into IT and OT networks

(source: Frizon de Lamotte, 2019)

Threats to industrial systems

At IT / SCADA level, the main risks are *data theft* or *corruption in the database, interception of the data flows* between the SCADA and the PLCs, or the *connection break* between the SCADA and the PLCs (Ackerman, 2017; Campos et al., 2016; Ghernaouti, 2016).

At the level of the process network and controllers, similar problems can occur: c*hange of variables*, *corruption* or *denial of service of the* PLC (Kiss et al., 2018; Pereira et al., 2017)).

Threats at the field network (sensors/actuators) level are much more physical and require access to the field network. An attacker could however:

- cause *network outages*, *intercept* or *modify data* in the network, as at the higher level,

- *disconnect a sensor in a* software (cyber) or physical way, *alter the operation of a sensor*, *block a sensor* or *block an actuator*, etc. (Ackerman, 2017; Meade et al., 2016).

2 Motivation for our research

Attacks on industrial systems, in addition to being economically costly for the company (Ikeda et al., 2019), are extremely dangerous because PLCs are in direct contact with workers and can injure them (Agostini and Filippini, 2019; Uchenna et al., 2019). One of the first incidents to receive media coverage was Stuxnet discovered in 2010. Unfortunately, the figures related by groups such as the CLUSIF SCADA group show a significant increase in incidents since then. It was thought until five or ten years ago that a small business could not be the target of an attack. But the attacks that have occurred in recent years (especially cryptovirus) have shown that, on the contrary, not being secure was really a problem since a company can still be a collateral victim of a large-scale attack (Zarreh et al., 2018).

Because cybersecurity awareness and education is all the more important in the era of digi-

talisation and industry 4.0 (Bada and Nurse, 2019; Catal and Tekinerdogan, 2019; Gordon et al., 2018), this article **discusses the classic vulnerabilities on industrial architecture** and **proposes recommendations / best practices for securing these networks** while guaranteeing the real-time capacities to which they are constrained.

The objectives of our research are threefold:

(i) to raise awareness of the problems of industrial systems and their networks,

(ii) to understand the threats on these systems to become aware of them,

(iii) and to recommend some best practices to secure industrial architectures.

3 Empirical study

In order to interest professionals in the issue of industrial systems cybersecurity, we posted a quiz on the Facebook and LinkedIn platforms for thematic groups on cybersecurity, information systems security, industrial systems, SCADA or even industry 4.0. Entitled " *Think you are aware of industrial systems cybersecurity? Take this 20-question quiz and test your knowledge!*", this quiz proposed people to answer the questions and then opt-in whether they wanted to see their results (allowing us to collect their email address). The quiz questions focused on the vulnerabilities of the different industrial systems and networks, possible vectors of attack, and the protections to be implemented. The quiz has been posted on the networks from 16-22 September 2019 (one week) and attracted 522 candidates. Among them, we only retained the responses of CIOs working in an industrial environment, i.e. 173 answers. The *questions, answers and statistical results of the quiz are detailed and discussed in the full version of this article.* All survey material can be provided upon request.

For reasons of geographical proximity, we then contacted 18 of them again (having leaved us their e-mail address) to ask them if it was possible to come and visit their factory; several CIOs responded positively. These upcoming visits may give us the opportunity to *complete this study by writing mini-cases that could be included in the final version of this article.*

4 Summary of findings

We did not really analyse the responses of the other respondents. But among the targeted population of CIOs, the "scores" ranged from 02/20 to 20/20 with an overall average of 14/20. This wide gap in ratings shows that some CIOs unfortunately do not have the necessary skills to perform their duties, but fortunately the majority of them are aware of the main principles of cybersecurity in an industrial environment.

The errors made mainly concern the OT part. Indeed, there has always been a perception –and this is still the case in some industrial companies–, that operational systems are isolated from the Internet and thus free of all security risks. But today we are seeing an increase in computerised OT systems, connected to IT management systems. And from the moment a management system is connected to the operating system, there is a path to access the operating system from the Internet and therefore there is a risk. Physical attacks are also very frequent. Finally, today sensors and actuators have become intelligent; they are connected to computer networks so they are also potentially targets for cyberattacks (Mourtzis et al., 2019). We are moving towards an awareness of the vulnerability of industrial systems, but this understanding is very recent.

The contributions, limitations and possible extensions of our research are developed in the full version of this article.

5 Recommendations and conclusion

The last section of our article, in its full version, recommends some protection measures and best practices that can be implemented simply to prevent attacks and secure industrial networks. These measures are based on the thirteen best practices for securing networks derived from the Industrial Security Guide of the French National Agency for Information Systems Security (ANSSI). This guide complements and simplifies existing standards, such as ISA 99 and SP 800-82 (an American standard), and also reports best practices identified in industrial companies. Besides, it presents a system analysis methodology to analyse and define the adequate protection to be implemented for a given system.

As a concrete (and very simple and cheap) example, firewalls could be implemented between the different networks:
- at levels 3-4-5: between corporate networks and the process network, a first firewall would prevents unauthorised access to runtime data from the corporate network, ... *(see the rest of our recommendations, the conclusion and indicative bibliography in the attached file)*

Keywords: Attack, awareness, cybersecurity, education, industrial network, industrial system, industry, protection, threat.

Dynamic Capabilities for future Smart Factories – Workshop with LEGO® Serious Play®

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Lack of coordinated manufacturing strategy formulation

Due to turbulences in the market, demanding and critical customers as well as innovative and often disruptive technologies, manufacturing companies are forced to implement ongoing change processes. As a result, also the factory as the place of value creation need to be reshaped to an unprecedented degree at an unprecedented pace to an unknown, dynamically changing state. The vision presented by research and practice has been the so-called Smart Factory, characterized by a highly networked, socio-technical factory environment in which flexible and decentralized value-added processes take place. The requirements for the implementation of this visionary type of production are high. Starting with sensor-based condition monitoring, through the use of data analytics and AI, up to the interlinking of the plant supply chain, many players in the value-added network are forced to take action. Blueprints or standard solutions are not applicable due to the highly individual character of each factory. While best practices can inspire, they do not replace the critical questioning of benefits and the labor-intensive adaptation to one's own company.

As early as 1969 Skinner highlighted the strategic importance of manufacturing (Skinner, 1969). Since then, various approaches have been researched aiming to implement production as a competitive advantage in order to be successful in the turbulent market environment along the general corporate strategy. *Operations Strategy* as the resulting area of research, aims to optimize the company's core processes by taking four partly conflicting aspects into account (Slack and Lewis, 2011): higher-level corporate strategy (1), daily experiences of operational processes (2), operations resources (3), customer/market needs (4).

In addition to operational capabilities, which together determine the current competitiveness, dynamic capabilities, which are located at a meta-level and aim at the further development of existing resources (knowledge, technology, methods, processes, etc.), are of decisive importance. Barreto defines dynamic capabilities as "[...] the firm's potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and

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market-oriented decisions, and to change its resource base" (Barreto, 2010, p. 271). Jentsch summarizes the abstract understanding of dynamic capabilities in four core capabilities and details those with routines that are relevant in production systems (Jentsch, 2015). The following basic dynamic capabilities are identified:

- Sensing opportunities and threats
- Learning new knowledge and skills
- Integrating individual knowledge
- Coordinating tasks and resources

Dynamic capabilities thus are of a high-level character and support the activities of the Operations Strategy. They provide the answer to the following primary question: *How can the capabilities implemented within the Operations Strategy be further developed?* Answering this question is therefore also part of the strategy process. Due to the interdisciplinary character of the smart factory, the relevant stakeholders must be involved in this process, who contribute different perspectives and experiences. A correct understanding and a common language has to be ensured as a basis for strategic work to innovate appropriately.

Participatory Design of Dynamic Capabilities with LEGO® Serious Play®

Participatory Design aims to integrate interested parties or stakeholders into the design process to enable an improved quality of the design result due to the inclusion of more diversified knowledge as well as targeting a higher acceptance of the solution (Yanow, 2004). Tangible objects play an important role in this processes. This finding can be linked to the theory of constructionism (Papert and Harel, 1991) since it supports the notion of actively building with the hands in order to explore meaning. Besides the material the facilitation of the process is the second cornerstone for its effectiveness and the achieved degree of creativity. Participatory Design is therefore conform with the literature which suggests that the main factors in ensuring change are giving ownership to people, providing and communicating a clear vision, empowering people, and leadership (Fritzenschaft, 2014).

A method successfully applied in many use cases is LEGO® Serious Play® (LSP). Originally it was introduced to facilitate the strategy building process of the LEGO® Company. LSP can best be described as a facilitated workshop, where participants respond to tasks by building symbolic and metaphorical models with LEGO® bricks and subsequently presenting them to the other participants (Dempsey et al., 2014). The method enables the participants to interact in a non-judgmental, free-thinking and playful way and can therefore enable developing a common understanding of a situation, a common language as well as creative ideas in general (Kristiansen et al., 2009). LSP combines the elements *games*, *workshops*, *interactive environment* and *simulation* which form the basis for a successful sense-making process (Hansen et al., 2009). Participants are included actively in the creative problem solving processes and thereby building identity with the developed solution.

The LSP method has already been applied to a multitude of problems and purposes (Frick et al., 2013). In the area of production systems Jentsch (Jentsch et al., 2011) established a connection between manufacturing operations strategy and Innovation using LSP, Dempsey applied the method to process design activities (Dempsey et al., 2014), and Tawalbeh did a case study

on group composition as an influencing factor on LSP (Tawalbeh et al., 2018).

From the authors perspective LSP is appropriate for developing dynamic capabilities for a future Smart Factory. Due to the character of dynamic capabilities, the following aspects substantiate that argument:

- As dynamic capabilities aim to adapt existing resources of large parts of the company, various stakeholders must be involved in the strategy process;
- A higher level of abstraction is required to support problem solving, covering aspects of human, technology and organization;
- The acceptance in the later implementation of designed solutions increases through the identity formation during a workshop.

In anticipation of a case-study based research and application, the ARTEM OCC conference should be an appropriate platform for verification of a proposed workshop concept.

Compact LSP Workshop at ARTEM Conference

In the context of the conference taking place in Chemnitz, we would like to provide an LSP Workshop, which follows an interdisciplinary approach. Covering the aspects human, technology and organization, participants will develop typical dynamic capabilities of a future factory. The workshop starts with a warm-up in which the participants are given the necessary building skills. This is followed by the building of ideal identities based on a fictional company example. In a final building step, the individual models are combined to a shared vision in the sense of the accumulated capabilities of a Smart Factory. Finally, the most important findings are to be worked out from the model and presented among other groups of the LSP session. In addition to the content related objectives, participants of the workshop will gain an insight into the method and a feeling for the possibilities of LSP.

From the facilitator's perspective, the workshop can be offered for two to three parallel groups, each with up to 8 participants, depending on the number of available facilitators and rooms. The duration of the compact workshop is suggested with approx. 120 minutes.

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Keywords: LEGO Serious Play, Smart Factory, Dynamic Capabilities, Participatory Design

Influencing factors on knowledge sharing and knowledge creation in virtual teams

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Due to increasing digitization and internationalization tendencies, the importance of virtual work forms is growing. Especially in knowledge-intensive, highly dynamic and international sectors, virtual teams have become a ubiquitous work form, promising more flexibility and higher performance for organisations (Fang, Kwok & Schroeder, 2014; Schiller & Mandviwalla 2007; Wipawayangkool, 2009). The peculiarity of virtual teams lies in the physical (geographical) distribution of their members (Hertel, Geister & Konradt, 2005; Schiller & Mandviwalla 2007). Compared to co-located teams virtual team members rarely meet in person and mainly collaborate via electronic media (Hertel et al., 2005; Wong & Berntzen, 2019).
One main reason for building virtual teams is the prospect of networking and integrating specialized and dispersed over spatial distances (Fang et al., 2014; Kauppila, Rajala, & Jyrämä, 2011; Schiller & Mandviwalla 2007; Senquiz-Diaz & Ortiz-Soto, 2019). In fact, virtual team members have to share and assimilate amounts of knowledge in order to solve complex problems (e.g. Senquiz-Diaz & Ortiz-Soto, 2019). Thus, knowledge sharing and knowledge creation are success-critical processes in virtual teams (Alavi & Leidner, 2001; Olaisen & Revang, 2017; Senquiz-Diaz & Ortiz-Soto, 2019).

Despite upcoming technological opportunities for networking dispersed experts, knowledge management over spatial distances comes with special challenges. Particular the fact that members of virtual teams rarely meet in person leads to different conditions for communication compared to co-located teams (Dulebohn & Hoch, 2017; Wong & Berntzen, 2019). As recent research indicates, virtual teams find it harder to overcome social distance and to develop trustworthiness among their members (Hoch & Kozlowski, 2014; De Guinea, Webster & Staples, 2012). Furthermore, they face more communication issues (Daim et al., 2012; Huang, Kahai, & Jestice, 2010). As a result, knowledge sharing and creation in virtual teams may be more prone to errors and takes more time (e.g. Hayward, 2002; Kauppila et al., 2011; Aritz et al., 2018; Klitmøller & Lauring 2013).

Research on knowledge management in the context of virtual teamwork is limited (Senquiz-Diaz & Ortiz-Soto, 2019) and lacks of a common and integrative basis (Fang et al. 2014). So far, there exist only a few studies investigating influencing factors and conditions for effective knowledge sharing and knowledge creation in virtual teams. Furthermore, current studies mainly consider a one-sided perspective on knowledge processes, focusing solely either technology (e.g. Majchrzak, Malhotra & John, 2005; Rienzo & Bernard, 2009) or human factors (e.g. Cornelius

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& Boos, 2003; Haas, 2006). However, as technology getting more complex and interactions between technology and team members getting more complex too, more holistic analyses are necessary.

The current study addresses this gap by exploring success-critical factors and conditions for knowledge sharing and knowledge creation in virtual teams from a more integrated and comprehensive perspective. The main purpose is to gain a better understanding of influencing factors as well as their weightings and interactions in virtual teamwork situations.

The database of the present study consists of 27 in-depth interviews with members of 20 virtual teams, stemming from six German companies. The interviews were partially structured and grounded on the Critical Incident Technique (CIT) introduced by Flanagan (1954). The CIT is a qualitative research method that helps to identify success-critical behaviours in specific situations and has been frequently used in different disciplines (Butterfield et al., 2005). As an inductive approach this method enables to gain new insights, independent from prior research (FitzGerald et al., 2008). Thus, with the help of the CIT critical factors and conditions of knowledge sharing and creation in virtual teams can be detected, which have not yet been considered in literature.

For the present study incidents were collected, which participants perceived as critical for effective knowledge sharing and creation. Participants were invited to describe successful or not-successful situation in as concrete and comprehensive a way as possible, including information about cause, course, results and involved persons.

Following Flanagan (1954), the evaluation of the critical incidents was carried out as an inductive process, consisting of development and application of a standardized categorization system. Thus, the first stage of evaluation was inductive category formation based on the rules of Mayring (2014, p. 79 ff). For this purpose, transcribed interviews were converted in a list of incidents, resulting in 141 critical situations. The second stage of evaluation consisted of in-depth analysing of relationships between categories by using the method of "content structuring" (Mayring, 2014) respectively "axial coding" (Strasser & Corbin, 1998).

Results of inductive categorization revealed 45 sub-categories of influencing factors on knowledge sharing and creation. All sub-categories could be classified into one of three main categories: technological, social and organizational factors. Results of axial coding showed, that each reported incident included factors from all three main categories, which showed specific interactions. For example, extent of personal familiarity influences choice of available communication tools and available technology effects type and scope of situational coordination. Furthermore, results indicate six occasion types of knowledge sharing and creation, e.g. formal vs. informal knowledge sharing. Additional evaluations have to analyze the situational differences in occurrence and interaction of the influencing factors.

In sum, the results of the current study illustrate the importance of an integrated view on knowledge management in virtual teams. That is, technological, organizational and social factors need to be considered and managed simultaneously. These findings can be used for designing and optimization knowledge sharing and creation in virtual teams.

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Keywords: virtual teams, knowledge sharing, knowledge creation, critical incident technique

Evaluation of Technical Processes for Fibre Recycling made from PE-UHMW, including Ecological and Economical Aspects

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Number twelve of the United Nations sustainability goals is to rebuild our society regarding responsible consumption. [1] This includes above all the promotion of resource and energy efficiency. The current figures of the Global Resources Outlook 2019 tell how urgently we need to change our pattern of behaviour, otherwise in 2050, we are going to depend on three earths to fulfil our needs. Resource consumption causes round about 50% of climate gas emissions and accounts for more than 90 per cent of our biodiversity loss and water stress. [2]
From 1990 until 2017 the resource consumption grew up to 300 per cent. In the European Union the per capita consumption of resources is about twice as much as the global average. In recent years a lot of legislative activities have been launched to address this challenge. The first-ever European strategy for plastics in a circular economy was adopted in January 2018. Europe produces 25 million tonnes of plastic waste but only 30 per cent is recycled, if the current production trends continue, by 2050 plastics could account for 20 per cent of oil consumption and 15 per cent of greenhouse gas emissions and there could be more plastics than fish in the sea. [3]

Recycling possibilities of polymers are diverse, but a real material recycling of postconsumer plastics seems to be the last challenge for the waste management industry. Difficulties do not only arise from resentments of costumers concerning the quality of the recycled material, but also from low prices for crude oil and from rising prices for energy leading to increasing prices, caused by high process efforts within recycling. [4]

At the professorship of conveying and material flow technology at Chemnitz University of Technology, the research team "Textile Machine Elements" analysed among others the technical possibilities of recycling fibre ropes made from PE-UHMW (ultra-high molecular weight polyethylene). PE-UHMW is a high-valued-added polymer with special properties. It is used for strongly-loaded applications, as mooring, tow and trawl ropes, slings and ropes for heavy lifting applications and more. Under safety aspects the life-time of such ropes is limited and a reuse of the rope has not proved possible so far. . The special properties of the fibres like mechanical strength, high ductility and more, however, could be used in other products.

Against this background, from 2016 to 2018 a cooperation project (ZIM – Zentrale Innovation

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Mittelstand/Central Innovation SME) together with a medium-sized plastic processing company (CKT GmbH & Co. KG) researched for solutions for recycling of PE-UHMW ropes and their production wastes. The results of this research are the subject of this paper.

First of all, the possible processes for the end-of-life are presented in this paper and their advantages and disadvantages are being discussed. Three variants of processing are conceivable: (1) recovery of stable fibres from the rope and manufacturing into a nonwoven, (2) re-granulation (3) waste-to-energy. Furthermore, the energy consumption of the first variant was measured or rather calculated to proceed the Life Cycle Assessment (LCA). The results are discussed and compared with the third variant. Subsequently, a short economic examination is given, and the use of Environmental Product Declaration (EPD) for marketing of the recycled material is presented. Finally, conclusions and outcomes for the assumption of the introduction are drawn. [5]

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Omni-distribution Systems to manage Demand Order Fulfilment in Apparel Industry

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The world of business is characterized by its own set of commercial dynamics. It is within this milieu that this study explored the emerging strategies that characterize the world of commerce with its myriad challenges. In the prevailing commercial environment, retailers are adopting the omni-channel approach as customers demand a more seamless shopping experience. The study aimed to determine the effects of omni-channel adoption by a retail apparel company, and to ascertain how demand-driven omni-distribution systems influence the order fulfilment frequencies in a designated supply chain network. An exploratory case study was conducted using a mixed-method approach and a survey and interviews were conducted to gather data to determine the interrelationships between variables. Univariate and bivariate methods were used for quantitative analysis, while thematic analysis was employed for the analysis of the qualitative data. The study found that the emergence of omni-channel retailing requires a visible supply chain with cross channel capabilities for frequent store fulfilment via the omni-channel distribution system. The findings further indicate that delivery of online orders to stores results in increased growth and sales.

Keywords: Omni, channel distribution, demand, driven, order fulfilment.

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Digital Supply Chain Distribution of Music in the South African Recording Industry

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The advent of the Internet as a music distribution channel led to significant transformation of the South African music industry at the end of the twentieth century. The Internet and electronic supply chain systems influence customers to migrate from physical product offerings to digital downloading platforms that offer access to digitalised music distribution and quasi-real-time consumption. In determining the implications of the paradigm shift in supply chain music distribution from analogue to digital, this study aimed to identify the challenges associated with this transition; examine distribution operations processes for the digitalisation of music in relation to global market demand; and to establish the extent to which digital diffusion supply chain innovations influence digital music distribution and consumption in the recording industry. An exploratory research design was adopted and univariate, bivariate and multivariate statistical analysis techniques were employed to analyse the data collected from 217 musicians. The study found that the customer base of physical retail stores, which are perceived to be the drivers of digital music distribution, is dwindling due to the increasing number of independent artists and music entrepreneurs as well as technologically compatible media devices that encourage music downloads.

Keywords: Digital music distribution, digital distribution, electronic distribution, disintermediation, music distribution, Durban electronic music.

*Speaker

THE CHALLENGES AND RISKS IN BLOCKCHAIN IMPLEMENTATION – THE CASE OF FOOD SUPPLY CHAINS

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The information system Blockchain appears to have the potential to improve current business process transactions by offering a safer and more traceable supply chain (Wang, *et al* 2019). When managed properly it may offer an effective method of reducing corruption in business data processes which is vital to today's supply chain management (Korpela, *et al* 2017). This study provides insights into the current challenges of Blockchain implementation by highlighting the risks and challenges, which face those managing food supply chains. The analyses of 4 case studies shows how legal aspects, disputes over governance, standardization and high financial costs, coupled with the ongoing risk of human error are slowing the advancement of blockchain technology in food supply chains.

Keywords: block chain, supply chain, food, risks, management, governance, technology, sustainability, standardisation, costs, legal requirements

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Applicability of 3D-Simulation Software for software-aided Participatory Design for Industrial Workplaces and Processes

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In the past, engineers were usually working independently or in specialized teams when designing workplaces and processes or when optimizing existing ones. To reduce sources of errors and to provide more preferable solutions to the workers involving additional stakeholders in design processes is getting more important. This change towards involving the stakeholders directly is also known as Participatory Design (PD).
The methods of PD aim at involving available expertise of different persons and/or groups, such as factory workers, management and external engineers, who all have different skills, competencies and backgrounds, as an active part in the process. All participants can alike contribute to the results, assess the solutions and – if applicable – can bring in e.g. personal preferences. This consideration of expertise from multiple domains results in improved solutions which better fit the requirements of the future users and other relevant stakeholders, such as safety officers and maintenance staff. Due to direct incorporation of the stakeholder's requirements during the process as well as due to the additional expertise being available this results in more effective and efficient design processes with reduced needs for redesign and optimization. Additionally, this leads to an increased acceptance of the final solutions.

Besides utilizing PD for e.g. product design the approach also can be applied for designing workplaces and work processes. Industrial engineers, who are in charge of conception and implementation, often do not have extensive personal experience in the affected areas. This often results in solutions that do not fully meet the workers' needs and requirements in the first attempt and modifications must be implemented e.g. during operation. This makes the design time-consuming and costly and can lead to frustration of the affected workers. Workers' skills and expertise can be of great importance during the design of a workplace or a work process, as they are the end-users of the solutions and can provide valuable insight on specific knowledge and experiences. Using PD, their skills and competencies are taken into account.

Designing workplaces and work processes by utilizing 3D modelling software, such as computer aided design (CAD) and simulation, is state of the art in most companies. Especially due to the arising of Industry 4.0 digitalization, modelling and simulation are spreading to most industries and are introduced to Small and Medium-sized Enterprises (SMEs) as well. Modelling and simulation are part of the methods that have been transforming industrial design and production processes for a long time. Allowing to run experiments with virtual models even before

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the physical prototype is available. New digital technologies, such as Virtual Reality (VR), are transforming the way the design process is conceived. This allows implementing changes to the design easily, in a short time, at an early stage in a cost-efficient manner. Recently developed VR tools are user-friendly, allowing users to interact with the models also without extensive technical knowledge. Thus, also end-users can evaluate the production system performance and can provide their feedback. Consequently, simulation and VR seem to be valid tools to support PD as they facilitate collaboration as well as knowledge exchange among designers and users.

This article presents a study which aimed at assessing the applicability of the 3D simulation software Visual Components Premium 4.1 (VC) as a tool for designing industrial layouts. VC is a tool that provides various elements for designing industrial layouts, work processes and workplaces. It also provides a wide range of functionalities to simulate industrial processes and workflows and to assess their performances (statistics). VC also provides an advanced Graphical User Interface (GUI) and a very detailed 3D representation of the components, making it a potential tool for the collaborative design. Extending VC with the additional software VC Experience allows it to be used with VR systems, such as HTC VIVE, enabling participants of a PD workshop to have greater immersion in the 3D scene. The scene also can be visualized simultaneously on an external monitor, allowing even a numerous audience to visualize the 3D model and exchanging feedback in real-time.

A case study of PD utilizing VC as a tool for PD has been conducted, in which several layouts have been presented to a group of experts from different fields. Before conducting the workshops, the required 3D equipment and process models for re-designing an existing process in an existing production area, such as machines and parts, have been prepared by the engineers based on available process specifications and parameters. To provide an realistic use case the Experimental and Digital Factory (EDF), an industrial-near and factory-like laboratory with a functional production system, at the Department of Factory Planning and Factory Management of the Chemnitz University of Technology was utilized. The initial models created by the engineers were then presented to the audience in PD workshops utilizing the 3D capabilities of VC. After presenting the initial setup modifications requested by the participants were implemented ad hoc into the 3D models by the VC expert. Several modifications to optimize the setup were requested and subsequently have been assessed by running the simulation and evaluating the results (statistics). At the end of each session, a questionnaire has been provided to the participants to collect their feedback.

The participants recognized that 3D simulation is very powerful concerning the definition of the system, allowing to define numerous parameters to achieve a realistic simulation of the workplaces, work processes as well as the layout. Nevertheless, being designed as a tool for experts and with its advanced features and options this is a drawback when it comes to the applicability for PD. It required an expert user to define all relevant parameters, logics and models for the simulation. The definition of an interactive and animated 3D model is complex, requiring a skilled user to prepare the models beforehand. Thus, without training most workers will not be willing and able to use it on their own.

The expert is also mandatory for conducting the PD workshop, participants who are not familiar with the software depend heavily on the expert to implement their proposals. Due to only one person being able to implement a modification at a time, workshops can become time-consuming and creativity can fade, as participants have to wait for the expert to put the ideas into action and the ideation flow stops. When implementing major changes in the simulation models the participants were distracted and started parallel discussions on additional alternatives. Over the course of the workshops this led to a reduced participation in the design session. Divergent from the PD approach the participants could not directly implement and test modi-

fications to the layout by their own.

In conclusion conducting PD workshops with a 3D modeling and simulation software for experts with partly untrained participants needs further development and adaption. Nevertheless, the study showed several important requirements for simulation tools to be utilized in the context of a PD workshop:

(1) Existing modeling and simulation tools for experts need to be simplified and more intuitive to be utilized in PD workshops. This reduces the expenses for preparing a computer-aided PD workshop and allows to increase the participation of the stakeholders.

(2) Stakeholders, especially workers, involved in a computer-aided PD workshop have to be trained to use the utilized software upfront so all have the same understanding of the tool's functionalities and capabilities. This can be time-consuming and expensive in an industrial context, yet this could benefit from simplifying the tools.

(3) Stronger focus on tangible, immersive and easy to use interfaces for implementing an effective cooperation among the participants, e.g. relying on VR technologies. The currently available software only can be utilized effectively if the participants are sufficiently skilled in controlling 3D software, such as CAD tools.

(4) Modeling and simulation tools to be utilized for PD workshops need to provide interfaces for an intuitive and immediate variation of parameters and logics to not stop the ideation process when medium to major adaptations are requested. Otherwise PD workshops should be suspended to enable the experts to implement changes before resuming the workshop.

(5) To achieve a structured knowledge exchange and design process, it is necessary to rely on tools that allow participants to focus on the same model/process at the same time, allowing them to implement modifications and conduct assessments in real-time. The usability is fundamental for achieving a successful design. In this way, each stakeholder would be able to evaluate independently the effectiveness of the modifications.

The study has shown that available 3D modeling and simulation software does not yet fit the requirements of PD in a way that the benefits of the approach could be obtained in software-aided workshops. For successful application further development of the software as well as additional pre-training of participants is needed.

Acknowledgement

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Keywords: Simulation, Virtual Reality, VR, Modelling, Participatory Design, Knowledge Management

7. Humanistic Management

CSR firm transparency and employees working conditions. New evidence from European listed firms

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CSR firm transparency and employees working conditions.
New evidence from European listed firms

Aziza Garsaa

Elisabeth Paulet

Abstract

This paper aims to analyse the link between firm transparency and Employees-oriented Corporate Social Responsibility for 280 multinational firms listed in European capital market and belonging in manufacturing sector during the 2010-2017 period. It enriches existing empirical literature on firm Corporate Social Responsibility by focusing on firm transparency as a determinant of employees working conditions score. Using a panel data ordinal logit model, we found that firm transparency, measured by Environmental, Social Governance indicators disclosure score, is positively associated to employees working conditions score. These determinants as well as the intensity of the relationship between firm transparency and employees working conditions score are strongly dependent on sectoral characteristics. However, all the results obtained show a positive effect of firm transparency on employees working conditions score.

This finding proves that firms pay a growing attention to their reputation among actual and potential employees in order to motivate actual employees and attract new talents, whose expectations are matching with their own ones. They are clearly conscious that attracting new talents and/or increase their own employees' commitment and motivation by focusing on non-financial or intrinsic motives, represent a very important competitive advantage in a high competitive world market context.

Keywords: Firm transparency, ESG disclosure, employees working conditions, panel data, ordered logit model.

JEL references: L13, L14, M14, C23, C25.

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Keywords: Keywords: Firm transparency, ESG disclosure, employees working conditions, panel data, ordered logit model.

Gender Diversity in Audit Committees, Internal audit, and External Audit: A review

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The twenty-first century is a century marked by the opening of cultural and historical boundaries all over the world. This is the era of horizontal mixing between ethnic groups, countries, cultures, politics and people. From this perspective, a major problem arises in the business world, which is the management of diversity in general and gender diversity specifically. The promises of equal opportunities and the continuous struggles against all types of discrimination are currently the most demanding topics on a global level and on a European level specifically (Barth & Falcoz, 2007).
Ensuring an inclusive management characterized by anti-discrimination is now recommended not only to target the defined percentage set by law in some countries, but to also benefit from a range of positive advantages. If gender has been until now highly scrutinized through management literature and within the overall finance and accounting fields, little has yet been done in favor of the auditing field. But women's representation in internal and external auditing profession has increased dramatically during the past fifty years. The number of membership to the institute of internal auditors (IIA) and certified public accountants (CPA) has increased over the last fifty years enormously yet the contribution of women should not only be linked to numbers but to the added value the latter brings to this field of work (Kimmell, L, R, & Penny, 1991). In order to fill this void, this paper endeavors to give a comprehensive understanding and review of the existing literature on gender differences over the 'triangle of control' composed of audit committees, internal audit and external audit. Our aim is to make this article a major resource for all researchers seeking to understand gender differences in the audit field and to use it as a starting point to elaborate on more scientific research and fields.

Diversity with regard to gender is now part of a more restrictive institutional framework for companies. Women's representation quotas on the board of directors have been flourishing since 2004 in Europe. A policy in full swing that started In Norway, imposing a quota of 40% women on the board of directors of listed companies, and then moved to Spain and France in 2007 followed by Italy and Holland (Consob, 2014) (Terjesen, 2009). In 2011, France validated the obligation by law, for listed companies, to go to more feminization of the board of directors. Women must occupy 40% of the seats in 2017 with no reference to which committees; all businesses without women must absolutely name one within six months. At the same time, the Afep-Medef Common Code of Governance in France was revised in April 2010 to encourage

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companies to promote gender diversity in their boards.

Following this new wave of change, most companies rushed to abide to the new laws by electing more women to their board of directors which are still mostly occupied by men, leading researchers to suggest that women appointed to boards are only token (Scherer, 1997; Webber, 1996). In other words, Women's contribution is limited to the representation of their category to comply with legislative requirements or to discern any claims for discrimination (Zimmer, 1988). Therefore, most of the new research focused on explaining the effect that women's presence has on the board of directors, by examining the firm's financial performance after the introduction of the latter into the board over a period of time and found a positive association (Carter, Simkins, & Simpson, 2003) (Catalyst, 2014).

Audit committees are fundamental governance mechanisms in monitoring management disclosure practices' and internal control (Dhaliwal, Naiker, & Navissi, 2010). They are considered as one of the most important and influential members of corporate governance as part of the board of directors in honoring their obligations in order to supervise corporate management (Bedard & Gendron, 2010). Therefore, an effective audit committee improves the process of financial reporting and reduces asymmetry between stakeholders and management, which in turn increase the confidence in the credibility and objectivity of the financial reporting, internal control and risk management processes.

Transparency seems to be the current fad now in the makeup of boards. In other words, audit committees should be able to show stakeholders that the board is planning and anticipating seriously the business's future needs and doing their best to mitigate future risk. Pressures appear to promote women in audit committees, assuming that it will thus be a way to reduce self-interest and excessive risk-taking (Francis, 2015; Krishnan and Parsons, 2008). Literature both evidenced a positive correlation between gender diversity in audit committees and the quality of voluntary environmental, social, and governance (ESG) reporting (Bravo, 2019)and that female managers are rougher monitors than male managers (Gul, Srinidhi, & Ng, 2011); Ferreira, 2009). Nonetheless, studies examining the influence of female directors on the quality of financial statements seem to overturn this assumption (Sun, Liu, and Lan 2011). As such, if the presence of women in audit committees is desirable, palpable outcomes of effectiveness do not seem to be guaranteed when enforcing a quota (Tremblay, Gendron, and Malsch, 2016).

Statutory auditors, internal auditors and audit committees' directors are in front line with the earnings management processes (both accruals and real practices). Gender's effect on earnings management practices is based on the fact that women are more risk-averse than men (Francis, 2015). Krishnan and Parsons (2008) hypothesize that women are more ethical in terms of behavior when it comes to accounting policy's choices, which implies less aggressive earnings management to gain financial rewards. Therefore, women in audit committees, board of directors and top management will often require higher audit assurance to maintain their reputation, which will directly affect auditor's assessment of financial reporting quality (Huang, 2014).

The auditing process consists of four fundamental stages: planning, assessing risk, collecting evidence, evaluating the results and issuing the report (Ittonen, 2012). Due to the existing behavioral differences between females and males' auditors, researchers believe that gender may affect auditing practices through its effect on audit efficiency, audit quality, audit fees and auditor's attitudes regarding risks (Hardies, 2011)(Ittonen, 2012). Based of the risk adverse assumption, when it comes to overconfidence and risk tolerance, gender may affect auditors' decisions and planning strategies, as women tend to be more skeptical when conducting audit tasks. Females tend to be more precautious than males in the identification and measurement process of income and assets and apply higher control over good news than over bad news (Fran-

cis, 2015). Recent academic research has been focusing on the role of gender on the effectiveness of audit committees in constraining earnings management (Gul et al. (2007); Krishnan and Parsons (2008); Sun et al (2011)). Therefore, the effect of gender on auditing practices is to be considered from the demand side (management) perspective or from a supply side (auditors).

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This article is meant to be an original contribution to the theme of gender management in the audit field and proposes a clarity that is both complementary and new in relation to previous research carried out within the same framework of our theme.
We will dive into the existing literature, appraise their contributions and build a summary of all the findings in order to address current gaps in the literature and in the methodologies previously used.Finally, we hope that this review will provide guidance for future research tackling gender management and auditing, showing if current advances are fostering the main issues regarding women's attributes in the audit profession.

Keywords: gender management, audit, internal audit, audit committees, earning management

Cognitive and affective properties in leaders-member exchanges across neo-Piagetian stages of adult development

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Research theme: Deeper understanding of human and leadership development

Jean Piaget (1952, 1970), studying cognitive development in children, has identified that cognitive capacities of children develop in orders (sometimes also referred as stages), whereby subsequent orders transcend and includes the previous ones. He identified four core orders of cognitive development in children: sensory-motor (age 0-2; acting out reflexes, learning movements and physical coordination, embodied cognition); preoperational (2-7; development of imagination, magical thinking, mental representations, egocentrism); concrete operational (7-12; development of the simple abstract thinking that extends beyond concrete perceptions, simple hypothetical "if-then" thinking); and formal-operational (12-adolescence, logical thinking, mental operations with several variables, propositional thinking, "what if" logical solutions to abstract problems).

Neo-Piagetian followers extended Piaget's studies from children to developmental patterns in adults (how they unfold, and what form the take) (Reams, 2004). They have extended their research focus on human development from cognitive capacities (Commons et al., 1998; Dawson, 2006), to interpersonal understanding (Selman, 1980), moral judgment (Kohlberg, 1984), development of self (ego) identification patterns (Loevinger, 1976; Cook-Greuter, 1999), meaning-making mechanism (Kegan, 1984, 1992), needs and drives (Maslow, 1954, 1967), value memes (Graves, Beck, Cowan) and even dominant leadership logics (Rooke, Tolbert, 2004) and leadership style at each order of development (Harris, Kuhnert, 2008).

Taken together, all these research foci could be said that comprise different aspects of the development of human psyche. In Cambridge dictionary psyche is defined as the mind, the deepest thoughts, feelings, or beliefs of a person (or group). Thoughts, feelings, and beliefs (psyche) present the properties through which an individual perceives and interprets a specific life experience. In general thoughts, feelings, and beliefs (psyche), that construct a meaning-making mechanism (Kegan, 1982) transform on evolutionary truces that come forth when one encounters life experiences which cannot be brought into the coherent explanation with the existing thoughts, feelings, and beliefs (psyche). The person is pushed to transform the existing thoughts, feelings, and beliefs (psyche) (Sutich, 1976). In the process of transformation, the person experiences a liminality, a rite of passage, between and betwixt stage (Turner, 1967).

*Speaker

Human psyche evolves as a dynamic phenomenon. It can be treated as an infinite dynamic matrix consisting of four Jungian functions (Thinking, Feeling, Sensation, and Intuition) (Shafer, 2019). Sensation and intuition are considered two information-gathering functions that differentiate between two tendencies how people perceive (concepts or ideas about things, people, happenings) and bring information into their awareness. Individuals who prefer the sensation function are more likely to trust information that is in the present, tangible and concrete: that is, information that can be understood by the five senses. On the other hand, those who prefer the intuition function tend to trust information that is more abstract or theoretical; and tend to trust those flashes of insight that seem to bubble up from the unconscious mind.

Thinking and feeling are the decision-making functions that differentiate between two distinct tedencied of formation of judgment, decisions and conclusions around information that has been perceived (via sensing and/or intuition). Those who prefer the thinking function tend to decide things from a more detached standpoint, measuring the decision by what seems reasonable, logical, causal, consistent and matching a given set of rules. Those who prefer the feeling function tend to come to decisions by associating or empathizing with the situation, looking at it "from the inside" and weighing the situation to achieve, on balance, the greatest harmony, consensus and fit, considering the needs of the people involved.

Jungian structure human psyches (1921/1971) has been further deconstructed by Myers and Briggs (1980/1995) into four distinct dichotomies; keeping the Jungian dichotomy around the way people take in information (Sensing vs Intuition), and the way people make decisions (Thinking vs Feeling), while adding two more dichotomies: (1) the way people orient their energy in inner vs outer world (Extraversion vs Introversion) and (2) the way the orientate to the external world, with planning and organizing vs spontaneity and flexibility ((Judging vs Perceiving). These sets of opposite psychic preferences result in 16 possible combinations of, personalities 'types' also so called Myers-Briggs Type Indicator (MBTI) personality profile.

Jung (1921/1972) further differentiates between conscious and subconscious aspects of human psyche. In the process of psyche evolution subconscious aspects become conscious. Higher order of consciousness include greater part of unconscious becoming conscious. Shafer (2019) connected Jungian psychology with the latest discoveries of the Heart Math institute. In the process of making subconscious conscious the heart plays a critical role. Shafer (2019) relates Jungian functions of human psyche with latest discoveries of neuroscience of heart and brain. He proposes that sensing and thinking working with forms of captured by an electro-magnetic field of the brain, while intuiting and feeling are related to emotions by the electro-magnetic field of the heart.

Emerging research evidence show that Jungian/MBTI perception and sense-making personality tendencies transform with orders of human development. Vincent, Ward, and Denson (2013) explored: (1) whether particular preferences and combinations (as measured by MBTI) are associated with higher ego levels; and (2) whether particular personality preferences might act as inhibiting or facilitating factors in ego development. Their research on 374 adults (aged 18–61; 50 % female) that were undertaking 11 community leadership development and 2 professional management development programs, showed that preference for Intuition on the MBTI was associated with significantly higher order of development on program entry and with greater (and faster) development during the leadership/management development programs.

In general, leaders that are operating from the higher orders of development tend to operate from the higher level perspective (Cook-Greuter, 1999) and tend to be more intuitive in formation of judgment (Vincent et al. 2013).

Objects of study

In this paper we study how people at different orders of development tend to interpret (think and feel) leaders at different orders of development. Specifically, what are the tendencies in the follower's thinking (negative vs positive reasons) and what are the tendencies in the follower's feelings where relating to the leader (positive vs negative emotions; primary vs secondary emotions).

Research design

We have identified representative leaders at each stage of adult development, using Loevinger's ego development framework. For each order of development, we have extracted two representative exemplary business leaders that are well known on global scale. We selected extractions of their biographies and life lessons presented on the Youtube channel Evan Carmichael.

We have conducted two leadership development 40-hour long workshops for international postgraduate international students (aged 23-26). In the beginning of the workshop we have assessed their order of development by using WUSCT (Hy, Loevinger, 1996). In the next stage they have thoroughly review business and life success lessons of the selected leaders at each order of development. When viewing these videos, they were asked to reflect on two sets of questions: (1) Based on what this person is saying, what are his underpinning beliefs about key success factors in business and life; (2) observe your inner reactions to this person; what attracts and fend you off form this person; (3) why would you like to be led/ not led by this person; and (4) what kind of emotions is this person causing in you. In respect to the later, they needed to select from the list of 5 positive primary emotions, 5 positive secondary emotions, 5 negative primary emotions and 5 negative secondary emotions.

Our preliminary research results have showed that people can more closely relate to leaders that are one or two orders above them and have slightly higher perspective taking and not too big difference in cognitive capacities. Furthermore, people can emotionally relate more effectively with leaders that occupy higher orders of development.

Paper contributes to the field of human and leadership development in two ways:

1) We provide a comprehensive framework of human development of human psyche, its perception and meaning-making mechanism, the role of cognition and affect in the perceptions and meaning-making mechanisms at each order of development.
We apply this framework to study leader-member exchange between leaders and members situated at different orders of development. We zoom in on the properties of cognitive and affective attractors between leader-members across di

Keywords: Human development, sense, making, cognition, affect, orders of development, leader, member exchanges

How Competency Management Tools Can Influence Routines in Workshops Depending on New Strategic Intent

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When a company management imagines new production choices, the question arises as to how the routines will actually evolve concretely in practice. From this perspective, human resources departments (HRDs) play an important role in developing and implementing competency management tools (CMTs). These tools can be considered as artifacts (D'Adderio, 2008; Glaser, 2017) which aim to act on the routines of an organization, to make them evolve in a way which is coherent with management choices. Our communication is based on the case of an SME whose HRD has set up CMTs with the explicit aim of implementing strategic change and modifying working practices. The analysis of our case study shows that the CMTs have indeed played a role in the evolution of the production routine, but much more indirectly than imagined by their designers. This highlights the importance of organizational context, the interactions and the learning processes that take place, to understand how an artifact can influence the evolution of a routine. A better understanding of the complex dynamics which allow CMTs to change routines helps understanding the role of HRDs in these processes. HRDs should not just see their actions as consisting solely of developing tools to align operators' competencies with a company's strategy. Their role is also to take into account and manage the implementation and appropriation of these tools. From a theoretical point of view, our communication thus contributes to a better understanding of how management tools influence routines.

Keywords: competence management tools, artifact, routine dynamics, strategic change

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Thinking about whistleblowing from a Platonist standpoint – to dikaion, a root of humanistic management?

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Management sciences are traditionally rooted into a triptych – science, craft and vision, while humanity is not normally considered in Management studies. Yet, the mere addition of science, craft and vision leaves little room for humanity and mankind. If we assume that management, as well as economics, are means instead of ends, then what are they for? What is the end? One can reasonably assert that the end is the improvement of humanity, that is of human dignity and welfare.
From that perspective, a specific place should be devoted to whistleblowers. As the "watchdogs" do bark sometimes, they constantly face fierce retaliations: from professional exclusion to social ostracism through bankruptcy and divorce, and sometimes death. Recently, Kenny has defined whistleblower as "*an individual who speaks up about perceived wrongdoing in his or her organizations, to someone who can effect change* ***and experiences retaliation for doing so***". Retaliation is part of whistleblowers' collective identity. Logically, nobody should ever want to speak up, when facing the consequences of blowing the whistle.

Yet, whistleblowers still exist. Many of them act for the sake of the welfare of those who suffer from wrongdoings - a quest for "social justice". Whistleblowing is a behavior that may root into deontological ethics, instead of teleological ones. Strikingly enough, perhaps under the influence of teleological ethics, nothing has seemingly ever been written on social justice as a determinant to blow the whistle; this is all the more puzzling as whistleblowing can be framed as a morally courageous act, leading to the whistleblower's sacrifice. This clearly shows that whistleblowers prioritize the quest for social justice over their professional and social life – and sometimes over their lives themselves.

Yet, considering that a quest for social justice might be a relevant determinant of whistleblowing immediately leads to wonder what the phrase "social justice" refers to. "Social justice" in particular, has been contemplated by Ancient Greek philosophers. In an age of disruption, where artificial intelligence might well make bots look like sensitive creatures in a near future, relying on Ancient philosophers can sound weird. However, this first glance impression is misleading. Going back to Ancient philosophy and searching answers to contemporary problems there is precisely disruptive. Indeed, Greek philosophy might well be the field where the very roots of our civilizations might be found. We do consider that the analyses provided by Plato or Aristotle are timeless. This paper strongly builds on Socrates' figure as the first known whistleblower in history – who was sentenced to death for barking too loud. Of course, Socrates did

*Speaker

not blow the whistle on a business entity wrongdoing, but on dysfunctions in Athens society – which was an organization itself. Analyzing Socrates' motivations to blow the whistle and to face retaliations can nurture the debate on the sacrificial dimension of whistleblowing.

Claiming that justice (dikè) lies at the core of ethos and thus nurtures humanistic management is a tautology. Yet, what does "justice" refers to and how can this ancient notion enlighten contemporary managerial issues? Strikingly enough, though many theoreticians root their analyses in Rawls, Locke and Kant's theories, little has been written on the way Greek philosophers would analyze the notion of "justice". More precisely, business ethics may root a part of their theories in Aristotle's works. But it's now almost sure that Aristotle himself had read Plato extensively, and that the ethical works of Aristotle should be read in conjunction with Plato's. Hence, there seems to be a gap in literature on what Plato's analysis of "dikè" (justice) may bring to the contemporary debate on pursuing human dignity (based on justice) which lies at the core of humanistic management. Two of the three ethical dialogues *Apology* and *Crito* deal extensively on justice. Furthermore, the very history of Socrates' trial and death sheds light on a contemporary issue – the duty to speak up when something goes wrong and to face the consequences of speaking up.

This proposal thus aims at exploring the quest for justice, which is at the core of whistleblowers' behavior, from a Platonist perspective.

Why is it important?

Traditionally, the business of a business is doing business; however, this approach gives little room to mankind and humanity. Often, ethical endeavors are justified by making a business case. So to speak, ethical endeavors need to be bankable to be taken into account by executive management members. Companies tend to say they comply with very high ethical standards, though it is not always the case. Precisely, whistleblowers' role is to show this discrepancy between what is said and what is done. Even if they suffer from this situation, they mention that they did what they had to do, because they acted for the sake of justice. From that standpoint, they literally embody an ideal of justice, even when it leads to death. They put justice at the top of their values, above their material life or their life at all. Understanding the reasons why some rational agents do act that way might thus help understand better whistleblowing determinants.

Furthermore, Humanistic management is surrounded by mankind; however, nothing has been written on whistleblowing from a humanistic management standpoint. That is all the more understandable as Humanistic management is still a relatively young approach of management, where theories are emerging. While newest theories certainly deserve full attention, humanism was analyzed in ancient philosophy and, more precisely, by Ancient Greek philosophers. We then tend to consider that building on Plato from a humanistic management perspective could nurture the debate on whistleblowing, since this behavior has nothing new (it was very common in Athens, based on the role of Sycophantes).

What was done?

We built the paper in the frame of historical figure research methods (Werhane, Freeman & Dmytryev, 2017), based on the core figures of Socrates and Crito, as depicted by Plato. The first step was to analyze in depth two of the three main ethical Plato's dialogues – *Apology* and *Crito*. The analysis was based on the Greek text, with the support of French and English translations, especially to compare the way the Greek word "dikè" and its derivatives (e.g., to dikaion, the just) were translated and thus interpreted. Once the main essential concepts of justice were unveiled, they were confronted with whistleblowers' testimonies. These testimonies

mainly came from a book edited by one of the main French trade unions, whose "whistleblowing cell" collected testimonies, anonymized them and published them. During this second step, we focused on the determinants of whistleblowing, especially on the whistleblowers' perceptions of the social justice they were pursuing. We then questioned the very notion of "blowing the whistle", as being half-way between heroism and treason. Indeed, whistleblowers do challenge unethical behaviors, based on their own perception of right and wrong. They behavior is driven by an intrinsically personal conception of social justice. The problem of speaking up is that they then involve other persons – which is something the organization cannot accept, as it put the whole functioning in danger.

What was found?

The comparison between Socrates' story and contemporary whistleblowers is fruitful, insofar as the whistleblower speaks up about unethical behaviors. These are in fact deeply correlated to personal moral values instead of objective and impersonal rules (as legal ones are); thus it may sometimes be difficult for whistleblowers to prove that their behavior is right and that they're not betraying the group they belong to. Precisely, Socrates' experience sheds light on the perception of whistleblowers' behavior. Though their action is beneficial to the group, they may still be perceived as traitors, because their speaking-up amounts to breaching the implicit rules of the group. Another common point between Socrates and whistleblowers is that they tend not to be aware of the consequences of their speaking up. The *Apology* clearly shows that Socrates did not imagine he could be sentenced to death and even thought he should be awarded for his behavior – and similarly, whistleblowers rarely anticipate retaliations and take their behavior as right and just beforehand. The point deals with the consequences of whistleblowing: in *Crito*, Socrates makes it clear that he will not try to escape the sentence and that being just and doing what's just are more important than life – more precisely, a life which is not driven by being just and doing what is just is not worth living. While many whistleblowers wish they had not spoken up due to the retaliations, they have spoken up actually (and, sometimes, they were perfectly aware of the potential consequences). Doing so, they have implemented the idea that a life which would not be driven by doing what is just would not be worth living. Plato's ethical dialogues hence appear fully relevant to understand better this contemporary issue. Said differently, exploring Plato's dialogs allows to better understand whistleblowers; furthermore, using Plato's arguments and Socrates' experience might well motivate whistleblowers to do the right thing being fully aware of the consequences, that is convincing them to knowingly speak-up.

Keywords: Humanistic Management, Whistleblowing, Whistleblowers, Platonism

Human Capital Development and Faculty Members' Contributions

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High performance and organization development can be guaranteed by attracting, developing and retaining talented employees within an organisation. This study investigated the relationship between Human Capital (HC) development plans and faculty members' contributions at a Tertiary institution in Lagos. This study explores the mediating influence of HC development programs on the relationship between HC development plans and faculty members' contributions. This study adopted a survey research design. A quantitative approach of data collections and analysis procedures was adopted for this study. Data was collected from selected faculty members of a higher education institution in Lagos metropolis using simple random sampling technique. 306 self-administered questionnaires were distributed to the respondents at the institution. Three hypotheses were formulated and tested using inferential statistics via SmartPLS 3.3 software application, which is effective in running a Variance-Based Structural Equation Modeling (SEM). The results showed that HC development programs fully mediate the relationship between HC development plans and faculty members' contributions. This study submits that adequate funding and proper resources allocation to support smooth implementation of faculty members' developmental strategies is critical to university performance, in terms of quality of graduates and credible research outputs for national development.

Keywords: Faculty members' contribution, Human Capital development plans, Human Capital development programs, Tertiary Institutions.

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Humanistic Management

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Title: Humanistic Management

Introduction

In the words of the Virgin Group founder, Richard Branson, "Clients do not come first. Employees come first. If you take care of your employees, they will take care of the clients". This belief by Richard Branson shows that the world has evolved since the Industrialisation era; whilst the product and the production process were the issues then, the new thinking is that the workforce need to be taken care of in a more empathetic way. World renowned companies like AB Inbev are known for how they value their human resource, as expressed by one of their values that says, "Our people our enduring advantage". Understanding the workforce is critical to the business. Spitzeck 2001 posit that it is important "to reconcile economic as well as moral arguments" when it comes to managing the workforce.

Purpose of the Study

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Zimbabwe suffers from high rates of unemployment, low levels of productivity and a declining economy. Workers at the few companies that remain afloat present a generally stressed outlook. Stress and stress-related disorders have become one of the largest categories of occupational stress. Work stress is a major contributor to diseases such as diabetes, hypertension and mental problems. Keller and Price (2013) posit that, "organizational health is the ability of an organization to align, operate and renew itself more quickly than its competitors in order to maintain excellent results over time. The three key attributes that define good health are; internal alignment, quality of implementation and the capacity for renewal." The study is therefore appropriate for Zimbabwe and indeed other developing countries.

The Problem

The loss of wages and/or salaries and productivity due to stress related conditions such as burnout, depression and psychosomatic disorders has increasingly been indicated in the Zimbabwean workforce. Confirming this assertion, Bakker, Demerouti and Schaufeli (2003) postulate that, "Labour demands are predictors of variables like emotional exhaustion, burnout and health problems." It is therefore essential to investigate the depth of this problem among Zimbabwean companies and what these companies are doing, if anything, to alleviate this problem.

Method

The mixed method approach was used in this research. This method was chosen on the strength that the data generated using the questionnaire is quantifiable and expressed in numerical form, and constitutes the quantitative portion of the study. This also allows generalisations to be made beyond the study area. Responses talking to the opinions of the respondents obtained through interviews are mostly qualitative. The mixed method approach thus becomes more appropriate. Hurmerinta-Peltomaki and Nummela (2006) posit that the mixed methods approach "...adds value by increasing validity in the findings, informing the collection of the second data source, and assisting with knowledge creation". This research utilized a two-phase sequential explanatory design (Creswell and Plano Clark, 2011) which involved an initial quantitative phase in which quantitative data was collected using questionnaires followed by a qualitative phase in which interview data was used to explain the quantitative results for complementarity. The merging of the two complementary data sets was two-fold, first in developing qualitative interview questions using the quantitative results and secondly in the subsequent discussion after the two sets were analysed, with a view to gain a better understanding of the concepts and constructs of humanistic management as viewed by the participants.

Findings

As this research is still work in progress, these findings are based on literature review. Spitzeck et al, posit that the self-interested pursuit of profit is irreconcilable with truly responsible behavior as it binds a responsible course of conduct to its profitability. In other words, it is important that the business realizes that the means to a profitable end is to ensure that the workforce is committed to the cause. Commitment to the cause is achieved when the employees have a right frame of mind. This is achieved by a favourable environment that the business presents. According to Calleja and Mele (2017), "there is an emerging approach to humanistic management that consider a business enterprise as a real community of persons." He further posits that this promotes unity and favours the acquisition of human virtues of empathy and selflessness. The big manufacturing companies have invested in staff development & welfare programmes to keep customers motivated beyond just their salaries. Companies are now developing the total person such that they become a better person not only at work but in the home and greater community. By taking care of the employees companies have gained mileage and have benefitted from more

loyal workers.

Conclusion

The key learnings of this research are that the workplace is a "home" for the workforce and all the workers are a community of people who rely on each other to advance the organisational goal. It is a place where workers spend one third of their waking moments. Companies do well to invest in infrastructure and a human environment that is conducive to good productive outcomes. Whilst Zimbabwe as a country is operating at an unusual mode at this point in time, there are companies that have taken great strides in ensuring that the work environment is labour force friendly. Companies have invested in programmes and facilities that work to improve the lives of the worker and indeed their families. This leads to peace of mind to the workforce, freeing their minds to concentrate on the core business of the company. There is an opportunity for further research in the companies situated in the other regions of Zimbabwe as because of time and reach constraints this research was limited to companies in Bulawayo.

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Keywords: Humanistic Management in Zimbabwe

ESOPs in the cycle of sustainability: Evidence of Chinese firms

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As recommended by UN global compact principles, "sustainability begins with a principles-based approach to doing business." Beyond the traditional view only focusing on economic development, systems thinking of sustainable development builds the framework of triple bottom lines, integrating economic, social, and environmental developments. Responding to the calls for sustainability, firms expand their aims. Instead of maximizing shareholders' gains, they should defend the interests of all stakeholders both inside and outside firms, including employees, suppliers, creditors, local communities, and other entities. In managerial practice, environmental and social audits have been introduced to assess social and environmental performance, in addition to financial performance.
However, firms struggle to survive in the competition of the market. Philanthropy, voluntary social participation with paid employees and other activities of social responsibility, will unavoidably increase firms' costs. Without enough financial incomes and supports of shareholders' capital, firms are not strong enough to fight in crises and upgrade themselves in trends of technological innovations. If firms fail and die, they cannot fulfill promises of social responsibility. Furthermore, their working staff will become unemployed and create more social problems for the whole society.

Faced with this conflict in firm management, can we find one solution to create a positive cycle of interactions between various types of performance? For example, the implementation of a specific mechanism can improve social performance. This improvement will enhance financial performance. Meanwhile, financial performance provides more resource to support activities of social responsibility. Like a cycle, the implementation of this mechanism can reinforce the interactions of various factors and strengthen the whole system.

Based on this system thinking, our underlying thesis will examine various types of performance of ESOPs in China and their cycle effects.

The ESOP, Employee Share Ownership Plan, also known as the Employee Equity Ownership Plan, is a corporate finance approach that a company gives its shares fully or partly to employees working in their company (Shields & Brown, 2007). With the implementation of ESOPs, employees become firm owners, enjoying the same rights as the shareholders who contribute financial capital. Thus, the ESOP itself is one of the solutions to fulfill social responsibility, enabling firms to enhance employees' human rights and to facilitate the social mobility of employees. On the other hand, with the change of identity from working staff to employee-owners,

*Speaker

their interest will be more firmly bounded by firms' growth. Thus, the conflicts of different interests due to Agency problems will be aligned with the implementation of ESOPs, enabling firms to lower the turnover rate of working staff, to improve the efficiency of firm management, and enhance firms' financial performance. Finally, with accumulated financial outcomes, individuals and firms can afford more social and environmental activities, and with more tax paid by individuals and firms, the government can provide better services for retired people, children, environmental protection and technology research.

To overcome free-rider effects and shaping effects existing in traditional models of ESOPs, Chinese firms put a new ESOP concept into practice: Core-Staff-Based ESOPs, which involves the participation of senior executives, directors at the middle level, and any other excellent staff that make particular contributions to their firms. Distinct from the standard practice of western firms, these ESOPs, neither broad-based ESOPs nor executive-based ESOPs, require employee qualifications for their participation. Some of them also require performance assessments for distribution of ESOP benefits (Pan 2019).

All these ESOP qualifications and assessments introduce further competition among working staff in the workplace. We wonder if the implementation of Core-Staff-Based ESOPs will improve social performance for the whole working staff and any other stakeholders or reduce activities of social responsibility to maximize the benefits of shareholders and qualified employee-owners. Moreover, with possible gaps and conflicts between the qualified working staff and the unqualified working staff, we wonder if these Core-Staff-Based ESOP firms can achieve their goals and improve the firm's financial performance. Based on this thinking, we elaborate two hypotheses as below:

Hypothesis 1. The implementation of Core-Staff-Based ESOPs can improve the social performance of firms.

Hypothesis 2. The implementation of Core-Staff-Based ESOPs can improve the financial performance of firms.

For lack of information on pollution treatments of Chinese firms, the environmental performance research is limited in the current paper. We will continue this work in our future research.

There are numerous indicators to measure social performance as outlined by CSR guidelines or ISO 26000. In order to understand the attention of Chinese firms and select the most suitable variables, we carried out preliminary research based on Chinese firms' CSR reporting. In reality, very few Chinese firms publish independently CSR reports every year. However, about 900 listed firms out of a total of 3523 firms disclose their CSR activities in their annual financial reports. No matter which guideline they follow, among 5115 CSR disclosures during 2006-2016, 80% of announced CSR activities have focused on the protection of employees, 6% have focused on the benefits of customers and consumers, 6% have focused on the improvement of firms' CSR system, 4% have focused on the protection of environments, 3% have focused on the protection of shareholders, and 0.43% have focused on the protection of creditors. To follow their logic of behavior and facilitate our quantitative modeling tests, we choose the "payroll paid" as our explanatory variable to measure firms' social performance. This indicator includes employees' wages, salaries, social welfare contributions, performance bonus, private insurance, health cares, employee training expenses, allowance for travel or food, syndicate expenses and other expenses for employee benefits. Also, we select the dichotomy variable of firm nature as our control variable: Non-ESOP firms will be marked as 0 and ESOP firms will be marked as 1. We will use panel regression models for social performance tests.

For Chinese ESOP firms' financial performance, certain previous studies have used various regression models for tests. Their results demonstrate that these ESOP firms have overperformed more than Non-ESOP firms during the periods, both prior and post-ESOPs. Here we meet a logic paradox: whether the firms who overperformed more than other firms have chosen the implementation of ESOPs or the firms have overperformed more than other firms thanks to the implementation of ESOPs? To resolve this problem on causality, we will utilize another method to compare financial performance between Non-ESOP firms and ESOP firms, prior and post-ESOPs. As a continual work of previous studies, we will use the same variables as others: ROE and ROA.

Our preliminary research firstly confirms that Core-staff-based ESOP firms have increased payroll paid for the whole working staff in firms. Secondly, nevertheless this new system has been legally introduced since 2005, the majority of firms fully implemented ESOPs after 2007 and met a serious of crises in their business environments: the global financial crisis in 2008, European difficulty on governments' bonds since 2009, China's growth slowing down since 2011, the crashes of the Chinese stock market in 2015 and 2016, RMB depreciation during 2017, Sino-American international trade war since 2018 etc. If we compared only prior and post-ESOP financial data, naturally we would make bias in observation: ESOP firms have underperformed after the implementation of ESOPs more than before the implementation. However, if we draw a matrix between Non-ESOP firms and ESOP firms, prior and post-ESOPs, we can understand that the underperformance of ESOP firms in the period of post-ESOP is due to the impacts of environments. Because our test results support that ESOP firms have overperformed more than Non-ESOP firms in the same challenging environments and this overperformance between ESOP and Non-ESOP firms is more significant in the post-ESOP period than in the prior-ESOP period.

Therefore, both Hypothesis 1 and Hypothesis 2 are well defended. The implementation of Core-Staff-Based ESOPs can improve social performance and financial performance of firms. Also, the protection of employees, this specific focus of CSR activities of Chinese firms, has enhanced the participation of employees, not only of qualified employees but also of unqualified employees. Thanks to this participation, more information has been contributed to reduce the bounded rationality of decision-makers, lower staff turnover has enabled firms to conserve the know-how and enhance the R&D process, and more capital flux have flowed into employees' training and health care, resulting in generation of human capital. All these efforts develop specific competences of firms to support themselves under challenging crises. With positive interactions of triple performance, firms and individuals live better and contribute better to society, and this is the charm of humanistic management for sustainability.

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Keywords: ESOPs in China, Sustainability, Cycle effects, Social Performance, Financial Performance

ACADEMIC CHALLENGES CONTEXTUALISED THROUGH CAREER PLATEAUS & CAREER STAGES: A CASE AT UKZN

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The study was conducted at the University of KwaZulu-Natal (UKZN), 5 campus sites: Westville, Howard College, Edgewood, Medical School and the Pietermaritzburg. The researcher utilised a sample size of 253 across all levels of academia from Tutors, Senior Tutors, Developmental Lecturers, Lecturers, Senior Lecturers, Associate Professors and Research Fellows to detect and categorise various areas of plateauing facing academics at UKZN at various stages of their academic careers. Due to academic discontent, the study aimed to identify academic challenges, thereby avoiding academic brain drain and the loss of academic talent at the institution. The study was theorised through the Protean career which relates to an incumbent's awareness of taking responsibility and independence to adapt and foresee current trends, skills and attitudes in their careers. The Career Choice and Career Management models further located the framework of the study regarding decisions in one's career. Moreover, the study underpinned Super's career stages theory, which comprises of five life and career development periods: growth, exploration, establishment, maintenance and decline. The career developmental tasks within the five main vocation phases provides direction in respect of how to reconstruct steadiness and uphold continuousness in a wider, indeterminate societal environment (Coetzee, 2015). By identifying academic challenges, the University can proactively engage in effective academic vocation forecasting and the management of academic careers and academic career programmes thereby creating an enabling and conducive environment for academics. There is a dearth of local and international studies and coverage on the plateau phenomenon in an academic context. The study had contextualised and confirmed the plateau phenomena in an academic environment hence it will make significant contributions in this context, more so with the formulation of a model to minimise and possibly eradicate the career plateau phenomenon in academia. With regard to career stages, the identification of key concerns in the relevant stages would allow the University to address them through infrastructure, relevant resources and training and development amongst other interventions. Through the mixed methods approach, the quantitative aspect included personally administered and electronic questionnaires uploaded on the university's intranet and the qualitative component was realised through a cohort of academics leaders interviewed across campuses. KMO and Bartlett's Test of Sphericity authenticated factor analysis. Validity was tested through face, content, construct and criterion validity. The questionnaire was adapted from Joseph (1996) and Lee (1999) for the career plateau construct, and items for career stages were adapted from The Adult Career Concerns

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Inventory (ACCI) by Smart (1994). Results from the study yielded significant relationships between various types of plateauing such as structural/hierarchical, job content, personal and job skill and the exploration; establishment; maintenance; and disengagement career stages. Further to this, there was a significant difference in the perceptions of employees differing on each of the respective biographical variables (age, marital status, job status, tenure, race, gender, and education level) and career stages and the career plateau construct and the variance in career stages was significantly explained by the career plateau status. Amongst others, some results of the study reflected a high level of consensus from respondents regarding hierarchical plateauing and limited opportunities for advancement at the University. A framework for the effective management of the various types of career plateaus across career stages in an academic environment emerged from the findings. Additionally, career plateaus strategies for the relevant stakeholders in academia at various career stages was put forward. The study furthermore, advocated a comparative study on national and international institutions of higher learning on career plateaus in order to ascertain similarities.

Keywords: career, plateaus, stages, exploration, establishment, maintenance, disengagement, hierarchical, structural, job content, personal, job skill, Protean, Super, academic

The impact of a facilitator during an idea generation workshop

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Since idea generation workshops have a finite time frame, the mobilization and stimulation of the participant to think and act creatively is a crucial pivot point that seems to be the hardest and most crucial challenge to master (Lee 2008; Fischer and Amabile 2009). In this context, the workshop facilitator, who moderates the workshop, plays a decisive role in this process and has to deal with various challenges. The facilitator plans, moderates, and leads the ideation workshop. Furthermore, the task of the workshop facilitator is to accompany the workshop participants in the process of generating ideas to work out better results compared to leave the team to work entirely autonomously. This means that workshop facilitators are facing challenges that are – among others - in some ways contradictory: For instance, on the one hand, a workshop facilitator has to anticipate the chemistry between workshop groups that never worked together to eventually create an atmosphere of productive cooperation, concentration and mental liberty (Jacobs & Heraclues 2006). Apparently, on the other hand, alongside the creation of a cooperative and liberated mood in an interdisciplinary group, the urge for continuously inspiring elements to motivate the participant is the central goal for a workshop facilitator. It is assumed that the quality of performance of the workshop facilitator has a significant impact on the idea generation process when it comes to a higher degree of quality of ideas and the individual workshop experience of the participants attending. For this reason, the research aims to examine which impact the facilitator of an idea generation workshop has on the release of creativity during a workshop and which type of (a workshop facilitator) personality is beneficial for the conduction of an idea generation workshop with playful interventions such as theater-based interventions combined with improv comedy techniques (Antal 2014; Clark & Mangham 2004b; Darsø et al., 2006; Larsen, 2005; Badham et al. 2016; Meisiek, 2004; Westwood, 2004; Kudrowitz 2010) and tool-kit based modeling (Sanders and Stappers 2014; Schulz et al. 2013,2015, 2017, 2018; Pässilä 2013; Roos et al. 2004; Statler et al. 2009). We validated our research aim by analyzing the output of ideas after an idea generation workshop in terms of quantity and quality, as well as the overall workshop experience of the participants in terms of flow, stimulation, and dependability. For this purpose, we conducted our research at a case organization, which is a German automotive original equipment manufacturer (OEM). In order to comprehend the unique requirements of conducting an idea generation workshop with the aim to favor and gain an increase in idea quantity and quality, first of all, the idea generation process is the subject of the research. By investigating the essential steps and necessary demands to be fulfilled for the ignition of creativity during an idea generation workshop, a process requirement-catalog was defined. In this context, the research of fellow theorists in the fields of innovation processes and creativity research of Wallas (1962), Amabile (1996), and Witt (1996) served as a resource of inspiration and reference. Since the workshop facilitator is primarily responsible

*Speaker

for ensuring the achievement of all requirements for an idea generation workshop, the research aims to emulate the innovation process requirements into tangible requirements and actions for the facilitator. It can be assumed that the better a moderator meets these requirements, the higher the creative output and workshop experience of the participants is. For this purpose, an individual
requirement catalog for facilitators was designed – based on the findings of fellow researchers and knowledge of experienced facilitators – which corresponds to the requirements for an idea generation workshop in this research. The relationship between the participants during the workshop is crucial for fostering creativity. The current state of research shows that the mood, as well as the barrier-free and uninhibited communication between the participants, is conducive to creativity. It can also be seen from the literature that individuals that lead a particular scenario can have a significant influence on group dynamics and working atmosphere. Besides, such individuals can individually influence the motivation, enjoyment, engagement, and flow state of other participants. It is of essential importance that the participants enjoy their experience during workshops in order to enable and empower them. Good ideas, with potential for future implementation, will only emerge if the participants enjoy their experience, feeling comfortable and operating in a state of flow. Establishing such a mood is one of the highest priorities of the facilitator. Besides the operationalization of specific requirements for facilitating an idea generation workshop, we assume that the personality traits of the facilitator have a significant impact on the quantity and quality of ideas as well as especially on the workshop experience of the participants during an idea generation workshop. The facilitators selected for this research aim differ in their professional experience, age, and educational background. For this purpose, the Big Five personality model will serve as a means of identifying personalities. The Big Five include the personality dimensions that have proven to be the best replicable and robust across multiple data sets (Goldberg, 1990; Tupes & Christal, 1992). Especially the factor-analytically constructed questionnaire procedure NEO-five-factor inventory (NEO-FFI) is considered as an adequate instrument to operationalize this research. Besides the personality test Neo-FFI, an additional questionnaire designed to determine the characteristics of the facilitator requirements (created for this research purpose) will help to create an overall profile of the facilitators. The additional aspects we examined via the questionnaire were methodological domain knowledge, communication skills, adaptive performance, adoption of perspectives and empathy, authenticity, time management, work engagement, and leadership quality. After the selected facilitators completed the Neo-FFI test and the questionnaire, each facilitator conducted two workshops with two topics at the case organization (one "gaming" topic and one "sustainability" topic) to review the research questions. The three "Gaming" workshops, as well as the three "Sustainability" workshops, were identically structured so that the facilitation could take place under comparable and controllable conditions. Both topics are still at a very early stage of the innovation process. So far, they have gone through the first phase of generating relevant search fields and are now in the phase of generating ideas, oriented to the innovation process of DeSouza et al. (2009). The workshops took place in a playful context since we applied purposely two playful interventions – theater-based intervention combined with improv comedy techniques as well as tool-kit based modeling methods – to review which facilitator personality and requirements are essential for conducting such a workshop format. This experimental setup was used to guarantee a robust research framework. In this setup, the personality and characteristics variety of the facilitators functioned as the independent variable while the dependent variables were the creative outcome (quantity and quality of ideas) and the workshop experience of the participants. By rating the level of creativity (Dean, Hender, Rodgers & Santanen, 2006), the potential for success (Lamm & Trommsdorff, 1973) and feasibility (Dean, Hender, Rodgers & Santanen, 2006) of the ideas from an independent expert group the dependent variable idea quality were examined. To analyze
the second dependent variable, we used the method of a questionnaire for the participants to investigate if the facilitators influenced the atmosphere and mood of the participants. The

questionnaire was structured in three aspects that define the overall workshop experience: To examine the flow of the participants, we applied the Flow-Short Scale of Engeser and Rheinberg (2008), the stimulation factor of Laugwitz et al. (2008) served as an approach to comprehend the level of stimulation. The third part dependability was also inspired by the work of Laugwitz et al. (2008) helped to find out in which way the facilitator's personality influenced the workshop experience of the participants. The study confirms the assumption within the existing sample that a suitable moderator can deliver a more prosperous and productive workshop. In comparison to the requirements and personality traits, one facilitator achieved the best fit to the facilitator requirements and delivered the best results in terms of creative outcome and workshop experience provided. Particularly striking were the results on the facilitator requirements - extraversion, communication skills, the ability to empathize, and perspective-taking – which were also confirmed by the facilitators Neo-FFI results. Since some conditions of the facilitator requirements have not been matched by the facilitator, e.g., proper time management, it is assumed that such requirements are not decisive for the success of an idea generation workshop. However, most requirements were fulfilled by the facilitator in question, therefore it can be assumed that the postulated facilitator requirements influence the effectiveness of an idea generation workshop. In conclusion, this research served patterns for requirements in facilitating an idea generation workshop. Furthermore, different personality traits and facilitator requirements were examined in order to state that the best fit for the requirements catalog created during this research has the highest probability of achieving a highly creative outcome as well as to provide an excellent workshop experience for the participants.

Keywords: facilitator, idea generation, innovation, creativity, personality, workshop, playful interventions, empowerment, management

THE MORE YOU KNOW, THE LESS YOU DO: EFFECTIVENESS OF BUSINESS ETHICS EDUCATION.

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The proposal is to be treated for the track on 'Humanistic Management' (Track 7). Alternatively, it can also be considered as part of the track on 'Collective Creativity for a Circular Economy' (Track 9)

- Introduction of new teaching formats or learning innovations
- Connecting teaching and learning practices to employer needs and global workplace trends
- Management of teaching and learning practices
- Curricular design or redesign

Integrative Live Case: A Contemporary Business Ethics Pedagogy

INTRODUCTION

Business ethics pedagogy faces numerous challenges and disparate attempts exist to identify the key components that would make an ethics pedagogy more effective and efficient. Integrating these attempts, a review of business ethics pedagogies identified the key foci of the extant literature to be lying in three *domains* – approach *(A)*, *content (C)*, and *delivery (D)* (Raman, Thapliyal, & Garg, 2018). Based upon this review, the authors had developed a comprehensive framework (ACD) for ethics pedagogy. Within each of these domains, *binaries* that reflect two alternatives pedagogical stances were identified. *Approach*, the philosophical standpoint, could be theory-laden or real-world connected. *Content,* the constituencies addressed, could have focus on breadth or depth. *Delivery,* the execution of the adopted pedagogy, could be traditional or innovative.

The above review of business ethics literature also identified a lack of pedagogies that comprehensively focus on all the binaries across domains and argued this may be source of numerous

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challenges that business ethics pedagogies face. Consequently, these authors developed a generic pedagogy-*Integrative Live Case*-based on the ACD framework that they had developed. Based on an incident that is currently unfolding (a live incident), this pedagogy allows integration of binaries across the three domains. It also allows for a modular course plan that can accommodate varied pedagogical preferences. Volkswagen Dieselgate will be presented as a stylized example to showcase the significant advantages of using this pedagogy.

PEDAGOGICIAL FRAMEWORK

Figure 1 provides a schematic of this framework (above). The pedagogy developed, and labelled the "Integrated Live Case" method, is based on a contemporary ethical breakdown covered in the media and is yet to attain closure. The temporal proximity of the context provides a greater possibility of millennial connect with the promise of leveraging 'wisdom in the classroom'. Moreover, the scope of enabling student participants by allowing access to internet (by allowing mobile phones and laptops in the class) also exists. The class participants function as live information feeds, providing the class with new information, resulting in a higher sense of empowerment and are higher sense of ownership towards the course. The pedagogy is integrative, as it not only covers the three pairs of binaries across the three domains in the ACD framework but also promises to be highly effective to deliver an ethics course integrating the individual, business and the society (as per the IBS framework). The ILC method can be adopted in an ethics course in five/ multiples of five sessions. A diagrammatic representation of the course structure is presented in figure 2.

Figure 2: The ILC methodology

Keywords: Approach, Content, Delivery, Integrated Live Case

Human Chain: Reconnecting Individuals with Nature

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This work attempts to elucidate the paradox of the human condition. While we are born out of nature and often have primal urges to be reconnected with it, as a global society, we have progressively built up physical and psychological walls around us that completely separate us from our natural environment. We argue that numerous tensions, even paradoxes, limit the perspectives of many people today. In the developed or industrialized world, we live in a world dominated by values of what scholar Bill Frederick called economizing, which are supplemented by power-aggrandizing and technological values. Yet our longing to be in nature puts us deeply in touch with another set of values that we argue are much needed today-values of ecologizin-gand civilizing, to bring balance back into the relationship between us humans and the natural environment from which we come and to which we are integrally related.

Humans struggle with drives for both cultivation and destruction in terms of our relationships with each other and our surroundings. These tensions and even paradoxes are the dualities of life. We explore some of these paradoxes and the ways in which they have shaped today's dominant "modern" culture, especially in the industrialized (Northern and Western) world. We humans have both the ability and motivation to cultivate *and* destroy. We attempt to address a whole cascade of human dualities and dualisms to see if there can be a synthesis that allows us to transcend the limitations of today's perspectives and enable movement towards a world where all, including all living and human beings, can flourish.

In this work, we explore the following questions:

- Can individuals, business organizations, and societal legislative bodies strive toward social innovations that do not mute our natural environmentally oriented values?
- Can we innovate to reconnect (linkage value) with nature?

We contend that there exists a universal sustainability ethic rooted in the naturally derived environmental values embedded into the cognitive algorithms of all human brains, but that cultural adaptations through evolutionary time have gradually created a synapse-an adaptation gap-in terms of the activation of these algorithms. Survival pressures and a changing environment

*Speaker

presented numerous challenges to humans from the Pleistocene Era to the present moment. Humans innovated and developed technological tools through natural selection in response to these survival pressures, but our awareness and activation of our environmental values and drives has been muted by cultural influences.

Ultimately, we propose contours of an ethical system based on an ecological–ecologizing–foundation that would be suited to honoring the lives of future generations and that have a long-term focus. These features of this approach will allow us humans to create global governance over the global commons, deal with intergenerational equity issues, and foster holistic development of human potential in ways that today's approach of economizing does not.

This piece offers strategies for reconnecting the human "chain" and thereby re-establishing our links with nature, both emotionally and cognitively. Through our research and the work of many great scholars, we have discovered quite a bit of evidence that most people would like to feel and experience a greater bond with nature. But, we also recognize that there exists a moral imperative to *live with, in, and of* nature rather than project a dominion *over* it. Thus, our book seeks to resolve our natural human paradox as a normative necessity. We believe that no matter one's political inclination or viewpoint on sustainability issues, there lies beneath a natural sensitivity to preserving our ecological environment. Over *Homo Sapiens'* evolutionary history, this sensitivity has been suppressed by a dominant set of values that do not *value* their opposite and that in fact are much more linear in their orientation. Our muted values for sustainability were, from this perspective, an unavoidable evolutionary consequence to survival pressures throughout time. Yet, the countervailing values that embed and value paradox in our thinking and actions still exist and can, we argue, re-emerge through creative human intervention. If we can transcend and include today's economizing and technologizing values into a more broadly defined set of values, e.g., ecologizing and civilizing values, then we believe there is hope for a better future for humans-and all of life's creations. It is possible to move from *Homo Faber* ("Man" the creator) *to Homo Sustinens* ("Man" the cooperator with nature).

While we identify essential links of the 'chain' as dualisms of human nature, each exacerbating the gap between people and the ecological environment, we ultimately see real, pragmatic opportunities for flipping the dualism into a duality, where we can restore a balance among our natural drives, while simultaneously recognizing the both/and of paradoxes in our world. Our goal is certainly not to suppress our motivations for economizing efficiency and technological progress. On the contrary, we look for solutions for establishing more of an equilibrium between humans' short-term survival motives and our more enduring sustainability needs.

One of the sources for the solutions we seek for restoring this balance and re-soldering our chain together lies with business organizations. Through our own doing, corporations have become the most prominent and important institutions in all of society. Business is such an integral member of society that we often personify corporations and think of them as individual entities. We even treat them as persons when it comes to the law. Without business, much that we experience in daily life would not exist. Business makes it possible to accomplish feats that would otherwise not be achievable on our own. But businesses are only one, albeit very important, piece of a very complex puzzle of actors whose perspectives need to shift from dominance to partnership or collaboration, as we will discuss later, and from economizing towards ecologizing as core values that drive our own actions and attitudes as people, and the institutions that we create. Thus, this work concludes by offering business solutions to the broken human chain.

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Keywords: sustainability, natural values, dualisms, humanism

The impact of performance management in higher education, with reference to South African universities. Are there more innovative and humane ways to evaluate academic staff?

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Background
There have been considerable changes taking place in higher education and these changes are responding to a multiplicity of factors. These factors include the development of information and communication technologies, factors around globalisation, internationalisation and regionalisation, a network society that is constantly advancing, a knowledge society that is also constantly advancing, socio-cultural trends, demographical trends, student demands, and the marketization in higher education, including the changing roles of governments. Higher education worldwide has been undergoing transformation. Pressure is sometimes applied on universities to become more 'businesslike' in their way of doing things. One of the consequences of increased 'managerialism' and 'corporatisation' in higher education institutions is an attempt to develop performance management/appraisal systems.

Why is it a problem?

The purpose of this paper is therefore to provide a broad overview of the current commentary and existing research on the state of performance management at South African Universities, to serve as a basis for developing a conceptual framework to further research and provide a solid theoretical understanding of the challenges and benefits of ensuring that performance management serves the best purposes of higher education in South Africa. It has been observed that, from the many reasons cited why PMS's have failed to deliver upon their initial promise one reason has been that the line managers have been reluctant to take responsibility to implement it. Many staff view performance management (PM) suspiciously, suspecting it is managements' way of policing them, reducing their performance to machine like outputs and experiences, and even at times finding them redundant. Some staff even feel that the objectives of PM and the expectations of the KPA's (Key Performance Areas) are unrealistic, often unfair or "inhumane"(not considering the essence of humanity and the nature of work), and not really achievable. They also perceive it as being punitive rather than developmental. However, despite the pressure to perform at peak levels, many universities struggle to manage the performance of faculty and staff.

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Outline of the Research Problem

The changes taking place in higher education are responding to a multiplicity of factors. These factors include the development of information and communication technologies, factors around globalisation, internationalisation and regionalisation, a network society that is constantly advancing, a knowledge society that is also constantly advancing, socio-cultural trends, demographical trends and the marketization in higher education, including the changing roles of governments (Farnham, 1999; de Boer et al, 2002; Sporn, 1999; Gumport, 2000). Higher education worldwide has been undergoing transformation. Pressure is sometimes applied on universities to become more 'businesslike' in their way of doing things. The constitutions of most universities have been changing, and within this changing paradigm the position and role of the academic staff have also come under pressure. This paradigm shift has had an impact on higher education institutions and has led to an increased emphasis on productivity, quality and accountability with regard to the key functions of a university. "One of the consequences of increased 'managerialism' and 'corporatisation' in higher education institutions is an attempt to develop performance management/appraisal systems" (Carl and Kapp, 2004). Carl and Kapp (2004) provide a critical overview of performance appraisal at one higher education institution.

Research Question

The study will intend to answer the following **main research question**:

- How does the implementation of effective performance management contribute positively to increased productivity and performance?

Sub-questions:

- How are key South African higher education institutions managing the performance of their staff (leaders, managers, academics and administrative support)?
- To what extent are the different performance management approaches used by South African higher education institutions influencing their key institutional performance measures?
- What are the key enablers and inhibitors of successful performance management practices?

Research Methodology

It is envisaged that 3 other tertiary institutions that have implemented performance management during the past 3 to 5 years, will be chosen for the study (using random sampling). The researcher will examine HR practices (in relation to PMS's) at these institutions and determine their potential contribution to this study in order to select them to be part of the study. The target population will include academic staff selected through stratified random sampling and

academic support staff chosen through random sampling.

Research Design: Mixed Method Research

The study will be based on a concurrent embedded design. Quantitative and qualitative analyses will be undertaken concurrently. Similar to the concurrent triangulation approach, the concurrent embedded strategy of mixed methods can be identified by its use of one data collection phase, during which both quantitative and qualitative data are collected simultaneously (Creswell, 2009). The concurrent embedded approach has a primary method that guides the project and a secondary database that provides a supporting role in the procedures. There are many reasons why mixed methods approach is preferred. Generally, it is used when both sets of data is available. In this study this is the case as there will be document analysis, use of surveys as well as interviews.

What are the proposed outcomes?

The role of a performance management system will be outlined within a holistic view of the role and functions of the institution. A theoretical framework for an individualised performance appraisal system will be described and critically analysed. This is linked to an argument for a triangular approach to performance management using profiling, contracting and the use of portfolios as possible ways of individualising appraisal. A critical review of this triangular approach will be provided and contextualised, using the case studies of the targeted higher education institutions, and making the appropriate comparisons between other higher education institutions in order to come to conclusions. Ideally, the question will be answered. Is PM for South African universities acceptable and effective, and or are there alternative, more "humane" and/or more innovative ways to assess university personnel in the changing world of knowledge management and generation?

Key terms. Performance management, performance appraisal, managerialism, corporatization, higher education, key performance areas, innovation.

Keywords: Performance management, performance appraisal, managerialism, corporatisation, higher education, key performance areas, innovation.

A Conceptual Model of CSR Mediation with Brand Attachment: The Banking Sector in Lebanon

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From a corporate perspective, Corporate Social Responsibility (CSR) can be seen as a major driver for sustainable development. The current fierce market environment obliges corporations to strive for success with every business strategy or tool to secure sustainability in the market. Progressively, corporations are applying CSR strategy to leverage their competitiveness, image, reputation, and growth.
Accordingly, CSR is one of the strategies that corporations may be thinking of applying in the market to gain the previously mentioned benefits (Golob, Lah, & Jancic, 2008). Peloza and Shang (2011) categorize CSR activities into one of three broad categories: philanthropy, business practices, or product-related. While the CSR initiative, introduced in this study, falls into the philanthropic category, as being cause-related, the focus is on understanding the customer outcomes from this initiative. Such outcomes include customer evaluations and behavioral outcomes. In addition to meeting societal obligations, proponents have argued that a more socially responsible organization will enhance business performance (Carroll & Shabana, 2010; Kim, Cho, Kim, & Lee, 2011), including positive customer outcomes, such as product purchase, firm Attachment, and favorable word of mouth (Du, Bhattacharya, & Sen, 2010).

Equally important, customer Attachment is defined as the relationship of relative attitudes on object (brand, service, and dealer) and repeat patronage (Onlaor & Rotchanakitumnuai ,2010), where most consumers believe that companies should engage in CSR (Becker- Olsen et al, 2006), taking this engagement level into consideration when making purchase decisions (Brown & Dacin, 1997; Sen & Bhattacharya, 2001).

Meanwhile, the service industry is essential to the economies of many developed nations, and the banking and finance industry is an important contributor to GDP generated from services. In the context of the highly regulated banking industry, fairly standardized services are usually offered by a relatively small number of players in the market, which has made it necessary for banks to be reliable in customers' minds, this is one of the reasons why banks must be customer-oriented (Alrubaiee, 2012; Liu and Wu, 2007; Pomering and Dolnicar, 2006; Roy and Shekhar, 2010).

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With this research, we will address the following research questions. Is CSR a must for an organization, or is it just PR window dressing and image building in disguise? Is CSR contributing to brand attachment and brand value creation? If CSR is a must for corporations, then does it mean we should agree with Edward Freeman's (1984) stakeholder theory, which says that organizations must fulfil the expectations of various stakeholders such as investors, customers and employees (Freeman, 1984)? Or does it mean that, ultimately, it is Milton Friedman's (1970) utilitarian view that counts, because businesses only need to fulfil their economic responsibilities, and CSR is a strategic management tool that does just that, and therefore the criteria of prioritizing and selecting CSR activities should be the ability to contribute to the financial performance of an organization, and hence management should only be held accountable to investors, but not other stakeholders (Friedman, 1970)?
The goal of this study is to fill this knowledge gap by focusing on the Banking Sector in Lebanon, and to think forward the general theoretical knowledge regarding the relationship between brand Attachment and perceived CSR as a complex construct.

Keywords: Corporate Scocial Responsability / Brand Attachment / Banking Sector / Lebanon

8. From Ego to Eco: Unlearning Social Entrepreneurship in the 4th Industrial Revolution

Rethinking the meaning of entrepreneurship - Alternative entrepreneurial biographies between social goals, autonomy and economic restraints

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What is the problem and why is it important?
In contemporary western societies, a decreasing public welfare, seemingly multitudinous opportunities of occupational career but also the will to lead an autonomous and self-determined life can be reasons for people to become self-employed entrepreneurs and freelancers. Individual freedom is also a central figure in the logic of entrepreneurialism in neoliberal regimes (De Lissovoy 2015). Freedom itself is often equated with "the liberty to move and compete in markets" whereas the freedom-limiting side of "the increasingly immoderate demands of capital" (De Lissovoy 2015, p.52) is neglected. This points to a gap between the widespread fantasy of entrepreneurship in mainstream neoliberal discourses and the realities experienced by entrepreneurs (Dey & Steyaert, 2018).

Mainstream literature continues to focus on wealth creation as the main driver of entrepreneurial efforts and describes entrepreneurs as opportunistic, highly educated, flexible and future-oriented (e.g., Smith 1967) with personality traits like aggression, leadership and eagerness (Viinikainen et al. 2017), finding their way in capitalistic, competitive environments. They are expected to contribute to the neoliberal system by promoting growth (Viinikainen et al. 2017).

Meanwhile, critical scholars have based their research efforts on the believe that most entrepreneurial efforts are driven by other than economic goals (Baker & Welter, 2017; Steyaert & Katz, 2004). They suggest defining entrepreneurship as a social activity of change aimed at challenging and transforming social orders (Calás, Smircich, & Bourne, 2009; Dashtipour & Rumens, 2018; Rindova et al., 2009). So far, both research strands seem to develop separately, so that social entrepreneurship is seen as an independent and detached phenomenon.

Consequently, entrepreneurs with a commitment to "weaker" incentives such as antimaterialism or community-orientation are likely to be labelled as social entrepreneurs (Abu-Saifan 2012) and discredited as "ideological" (Rose-Ackerman 1996).

This distinction is not only problematic; it also strengthens widely accepted neoliberalist beliefs that elevate the market and profit above social considerations and eliminate alternative viewpoints (Hursh & Henderson 2011, pp. 171ff.).

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We argue argue that entrepreneurs, despite of social-oriented motives, are neither necessarily capitalistic nor are they independent of the capitalist, neoliberal system. Individuals react very differently to the flows of capitalism, while some make use of them to live a self-determined way of life, others feel more imprisoned by economic and organizational constraints (Ikonen 2013). The motive and ability to challenge and transform social orders to make the world a better place depends not only on the characteristics and ideals of entrepreneurs, but also on how they and their businesses develop within the limits of the neoliberal, capitalist system.

Our suggestion is to re-imagine the idea of entrepreneurship as an integrative concept with its interrelated social and economic facets.

What did we do?

We address this issue with our case study by analyzing entrepreneurs' narratives, their alternative pathways and struggles with the neoliberal system and elucidating how they maneuver between social ideals and the pressure exerted by the system. In regard to that our major question will be: *How do the narratives of entrepreneurs reflect the ambiguous meaning of entrepreneurship in the field of tension between social change and wealth creation in the neoliberal system?*

Based on an ongoing in-depth multiple case study (Yin 2014, Eisenhardt/Graebner 2007) consisting of biographical interviews, we are illustrating a diverse group of people, who react differently to the flows of capitalism subsuming themselves under the umbrella of entrepreneurs. So far, we have examined three cases: The owner of a crossfit-box, the owner of a catering firm and the owner of a retail store. All interviewees do not fit the mainstream image of entrepreneurs in the neoliberal discourse and highlight other than economic goals for their entrepreneurial activities.

Our approach is the autobiographical-narrative interview (e.g., Schütze 1983). Narrative approaches have already been established as a method in entrepreneurship studies (see e.g. Boje & Smith, 2010; Downing, 2005; Johansson, 2004). We have extended this approach by splitting up the biographical interviews into two parts to stimulate people's reflexivity in between sessions and make it possible for us to prepare the second session on the basis of the first, which supports sociological reflexivity (Caetano 2015).

The transcripts of the recorded interviews were evaluated by using MAXQDA. We followed an inductive approach inspired by grounded theory (Glaser / Strauss 1967); all categories were created in the course of the coding process.

What did we find?

An analysis across all three cases shows biographical similarities that seem to have shaped the personalities as entrepreneurs. On the other hand, we were able to identify differences, particularly with regard to the interpretation of day-to-day economic challenges and coping strategies in dealing with them.

Even though all three do not see profit maximization as a reason for their activities and rather show an anti-materialistic attitude with motives such as helping others, they see themselves limited by the capitalistic system in which they have to find their way and are partly forced to act in a profit-oriented manner.

All three interviewees take a critical stance towards the German system, especially because

of rigid bureaucratic structures and unnecessary hurdles for self-employed. The German regulatory system had a particularly discouraging effect on the development of one's own business and had led all three to keep exit strategies open. However, reaction patterns in relation to the confining system are very different. While two of the interviewees characterize the system as a prison that severely limits autonomous action and freedom of decision-making as an entrepreneur, one interviewee sees the system as an obstacle that can be overcome if necessary by switching to a new business.

What do we recommend?

The results so far show that these entrepreneurs are using various patterns to interpret their work and working system. Such interpretations determine their experienced freedom and autonomy as entrepreneurs. To challenge and transform social orders, entrepreneurs with social ideals need to find their ways through the neoliberal system. Further research should make efforts to investigate restrictive effects of the neoliberal system that can limit entrepreneurs' success to contribute to social change and a sustainable future. Further, the separation of the mainstream image of entrepreneurship and social entrepreneurship should be overcome, as social and economic aspects are deeply interrelated.

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Keywords: Neoliberal system, entrepreneurial biographies, economic restraints

Female Business // Innovation "Fearless Girls"

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What is the problem?
"Fearless Girls" ("Fearless Girls," n.d.) is the name of a non-profit project to support "Fearless Girls" and it is a multiple case study to discover, to describe, and to promote the feminine in entrepreneurship, business, and innovation.

Fearless Girls are courageous women who bring the "feminine" into our economy and society. Unfortunately, these women are often neither seen nor rewarded anyhow. With the project "Fearless Girls", we give them appreciation in the forms of visibility, co-creation and with an on-year scholarship. Therefore, we raise money to thank these women. They thereby receive time to actively develop their great ideas without fear for money, meet adequate working partners and become more visible as role models. We are convinced of the power of Fearless Girls because they symbolize a future-oriented economy based on common good and sustainable development.

And it is our aim to proof this by scientific research methods by accompanying different Fearless Girls. Therefore, we have four research questions:

What is the "Feminine" in Business Behavior (Business Model, Management, Innovation) and how does it contribute to sustainable development?

What are most scarce resources, helpful action, and leading principals for Fearless Girls within their processes of innovation as well as daily business?

How do new forms of financing and funding contribute to an easier, smarter, and sustainable of Female Business or female Social Entrepreneurship?

How does a one-year reduction of scarcity of the resource "money" contribute to the success of a female business idea or innovation?

*Speaker

Why is it important?

It is necessary to uncover the forms of female business and female innovation to make them multipliable and furthermore to achieve global sustainable development goals.

It is important focus on "the Feminine" and qualitatively describe what it means in business life. The findings of the examples from the women will be reflected and interpreted with the existing literature and scientific findings. Thus, a theoretical gain in knowledge is also achieved which will have an effect on science. Against the background of the scientific and practical findings, the transfer of this knowledge will then also be possible.

The results can be used

- to encourage other women or men with similar principles and values to become active in doing business more female;

- in the discourse with politics and government;

- the special eligibility for funding can be explained in a well-founded way;

- to change the economy in the long term.

The women who dare to be observed, be interviewed and be studies will gain access to the results and connect with each other to expand their own network. Every single woman will receive attention and appreciation.

What will we do?

- Qualitative Study: data gathering within group discussions, interviews and observatory participation in a one-year panel design of different cases (Fearless Girls as unit of analysis)

- Data analysis: content analysis by Mayring (2001) (interviews and discussion) and artefact analysis with MaxQDA (Kopp & Menez, 2005)

- Theoretical Frame to prepare data gathering and interpret results is the resource dependence approach (Pfeffer & Salancik, 2003) with particular topical focus individual behavior for sustainable development (United Nations, 2015) and within female business and social entrepreneurship (Mair & Martí, 2006; Mair, Robinson, Hockerts, & Universidad de Navarra, 2006)

What will we find?

Content and Result related Outcomes & Methodological Equivalent

- Portray the "Feminine" in Business qualitatively and anonymously (Bottom-Up Approach ensuring personal data security)

- Outline the feminine behavior as an option to interact with the business environment (Theory-based Verification)

- Show the connection between feminine behavior in business and sustainable development (Embedding results in global challenges)

- Remediate our understanding of profitable business accomplishment (Interpreting results from an economic perspective)

- Make female role models visible and position their business behavior as future-oriented (Transferring results into practical value creation)

- Prepare future work of project "Fearless Girls" to monitor success similar to the interviews and participatory observations and their analysis (Templet of "Fearless Girls- Support" deduced from insight about used methods)

- Presentation of (interim) results to network during and at the end of the research (Transparency and documentation of research process)

- Equality- and diversity-oriented discussion of results about "feminine" behavior in business that is implementable by men and women (Ethical consideration and behavior in research)

- Empower Women! (Active and scientific methods- based listening, speaking, reporting, networking, co-creating)

What do you recommend?

Thus, we wonder:

What if we can prove that a different way of doing business

is successful in the long term and

serves sustainable development?

Be fearless, Girl!

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Keywords: Female Innovation, Female Business, Social Entrepreneurship, Sustainable Development

Track 9: Collective Creativity for a Circular Economy

Scientific capacity-building for sustainable development through research collaboration

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Knowledge has become one of the most critical drivers of innovation and development. Science-based and policy-driven research through collaborative efforts and innovation enhances sustainable development outcomes. The Sustainable Development Goal (SDG) 17 highlights the importance of partnerships in realizing the 2030 Agenda and research collaboration is identified as a significant driver of academic productivity to contribute to the societal transformation towards a sustainable future. Present-day challenges such as climate change, migration, or social injustice demand cross-border cooperation. Collaborative action is required because one single nation alone cannot solve global problems. However, little consideration has been given to emerging research and institutional capacities to better contribute to evidence-based policy-making or the design, delivery, and implementation of sustainability solutions, particularly in developing countries.
In the era of North-South, South-North, and South-South cooperation, now that researchers are more mobile and able to share knowledge, experience, and complex data sets online or in person, international research is increasingly conducted via various forms of partnerships and collaborations. Universities and research institutions have a critical role to play in achieving the SDGs through equipping the next generation of leaders, innovators, and decision-makers with the knowledge and skills to address the SDGs and providing research and technical expertise for developing practical solutions to meet them.

Sustainability as a transdisciplinary endeavor provides a framework not only for collaboration among different knowledge experts but also for the sharing and creation of this knowledge among local and global communities with a multitude of opportunities to employ alternative research-based pathways for transformation towards a sustainable future. Where Lack of human and intuitional capacities is hindering progress towards addressing critical sustainable development issues, research partnerships facilitate the sharing of knowledge and expertise, the broadening of networks, and learning about cross-scale research gaps and international best practices to create simplified, modernized and improved solutions in the focused region.

Blurring academic and professional boundaries facilitated by digitalization, the complexity of modernization, and expansions in the knowledge economy, collective action is necessary to achieve solutions that are impossible to reach by one actor alone. The convergence of researchers from divergent fields of specialization to co-create scientific solutions to identified challenges can produce more holistic and practical mechanisms for the implementation of SDGs.

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In order to build capacities of individuals and institutions for a strengthened science-policy interface, research partnership endorses researchers and stakeholders interested in the issue get together to work on various aspects of a study. Any form of research partnership is synonymous and akin to other types of research such as participatory, advocacy, community-based, applied, or action research. As the name suggests, collaboration is the basis and the goal of which is the co-generation of knowledge. Most current approaches lack coherence and follow through a poor understanding of the exact nature of capacity gaps and how to most effectively address them. The challenge of transformations to a sustainable future requires a systemic approach to capacity development that moves beyond the logic of short-term and one-off projects in favor of longer-term processes. This aims to strengthen science capacities and to advance integrated learning.

This study examines the functionality of the Nile Research Partnership (NiRep) framework to understand the role and effectiveness of collaborative research and capacity development of research institutions in the Nile region, consisting of eleven Nile riparian states along with the international research community. NiRep is selected to be studied as a new initiative in a multi and transdisciplinary research network to observe and understand its systematic growth from a local and international perspective.

NiRep's cross-regional partnership is characterized as clusters of inter- and transdisciplinary consortium aiming to establish long-lasting research-led relationships that improve science capacity, strengthen the research environment, enable collaborators to develop much needed, multi-criteria and demand-driven solutions for more sustainable management and facilitate research focus on the natural and human systems within the Nile River Basin. 2030 Agenda being in the center focus of research, NiRep is working on a broad range of interrelated topics, using science and technology to identify opportunities to leverage resources, minimize duplication, and pursue additional support and resources toward the shared goals.

The long-term objective is to establish an environment to attract and maintain leading researchers to work with pooling initiatives to develop an innovative demand-driven and sustainable knowledge-generating system for co-creating and co-development of science and practice with case-based reasoning in the Nile river region. The action intends to build individual and institutional bridges and capacities by technical and managerial oversight of involvements and skill.

The pattern of research collaboration, gaps, opportunities, and effectiveness among NiRep partners was explored using a semi-structured survey. The survey has been conducted to identify the demand-driven research gaps to map and link the on-going research on related domains. The way the researchers interviewed perceive the challenges of research communication, transparency, and linking research and policy. The study findings display elements of the 'mind the gap' approach to engaging with research stakeholders combined with aspects of critical 'science and technology studies' (STS) insights about how both knowledge creation and policy processes work in more complex ways than the linear model allows. Besides, the content analysis provided detailed information on partners' current research strength and further opportunities and barriers.

Keywords: Research partnership, collective action, capacity, building

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