Workshop Proceeding of the 2nd Workshop on Green (Responsible, Ethical and Social) IT and IS – the Corporate Perspective (GRES-IT/IS)

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Preface

For the 2nd Workshop on Green (Responsible, Ethical and Social) IT and IS – the Corporate Perspective (GRES-IT/IS), extended abstracts from various fields of the information systems research community have been submitted. We received 36 extended abstracts (the same as last time) and were happy to invite seven of them for presentation. Based on the request of some participants, this time, some interactive presentation was done online, so that travelling was not an issue. In addition, we slightly changed the submission process of the final version and offered to reflect the results of the workshop. Hence, the workshop participants had more time submitting their final work. Another new part of these proceedings is invited works. We invited Christine Bauer together with Eva Zangerle to submit their ideas. This enriched the workshop with new insights and distinctive research statements.

The focus of the submitted extended abstracts shifted more towards responsibility in various facets, showing current work in this area but also revealing gaps and open issues. Still, social issues and impacts have been important. The new topic "Cybersecurity" has found a lot of attention in the submitted abstracts, but unfortunately, none of them made it into the workshop due to various reasons. We very much appreciate these submissions and encourage the authors to re-submitting an improved version to the next workshop.

It is our hope that this working paper will make a good starting point and be of great use for other researchers doing research in this interesting and relevant area.

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Workshop Organizer

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Extended Abstracts in this Proceeding

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… is Chair of the Institute for Information Management and Control. He received a master degree in media and communication science (1992) and a Doctor of Philosophy (1994) from the University of Vienna. He further holds a master degree (1993) in business administration and a Doctoral degree in economics (1996) from the Vienna University of Economics and Business Administration. His main research interests lie in the field of technology and society. He currently works on social aspects of information systems, technostress as well as media and society.

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… is a Reader in Information Systems in the School of Management. Hari has a background in political economy and holds a doctorate in Information Systems from the London School of Economics. Hari has published in leading journals such as British Journal of Management, European Journal of Information Systems, Human Relations, Decision Support Systems, Technological Forecasting and Social Change, International Journal of Information Management, The Information Society among others; edited special issues for journals such as Journal of Information Technology (see Recent Activities below), Journal of Global Information Management, and Journal of Global Information Technology Management; and presented at numerous international conferences. His research centers around the social and organizational implications of information and communications technology (ICT), including the use of ICT for development and in developing/transition countries, and the use of social media in social movements.

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Barbara Krumay

… is Assistant Professor at the Institute of Information Management and Control at the Vienna University of Economics and Business. Her research interests target towards managing and controlling societal, environmental and economic influences of ICT viewed from the firm and individual levels of analysis. This includes impact assessments in (ICT) companies to asses social and environmental impacts, ICT-supported processes in companies to assess impacts of ICT, stakeholder involvement, measurement frameworks to assess social and environmental impacts of ICT, measurement and accounting of efforts for controlling social and environmental impacts as well as Green (Responsible and Fair) ICT. Testable frameworks and models are constructed to tackle research problems, which may originate not only in organizations from the ICT sector. She is the organizer of the GRES-IT/IS workshops in Vienna (2016 & 2017).

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… is a senior lecturer for Business Administration and Information Systems at the University of Liechtenstein and holds a doctoral degree in Social and Economic Sciences. He is Academic Director of the bachelor's degree programme in Business Administration and Deputy Head of the Institute of Information Systems. He was involved in several curricula redesign initiatives and AACSB accreditation projects. The core research interests of Bernd Schenk are educational technologies, technology-induced change, process management, and Enterprise Resource Planning systems (ERP systems). Bernd's research has been published, among others, in the proceedings of the International Conference on Information Systems (ICIS), American Conference on Information Systems (AMCIS) and the International Conference on Business Information Systems (BIS). Furthermore, he served as reviewer and contributor for the textbook "Management Information Systems" (Laudon/Laudon) and many more titles from Pearson Publishing.

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Eva Zangerle

… is a postdoctoral researcher at the University of Innsbruck at the research group for Databases and Information Systems (Department of Computer Science). She earned her master's degree in Computer Science at the University of Innsbruck and subsequently pursued her PhD from the University of Innsbruck in the field of recommender systems for collaborative social media platforms. Her main research interests are within the fields of social media analysis, recommender systems and information retrieval. Over the last years, she has combined these three fields of research and investigated music recommender systems based on data retrieved from social media platforms aiming to exploit new sources of information for recommender systems. She was awarded a Postdoctoral Fellowship for Overseas Researchers from the Japan Society for the Promotion of Science allowing her to make a short-term research stay at the Ritsumeikan University in Kyoto.

Information Imbalance and Responsibility in Recommender Systems

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Recommender systems [1] have pervaded people's everyday life. They help us to find relevant products in online shops [2–4] such as Amazon, to learn to know new music [5, 6] such as on Spotify, or to find movies [7, 8] that meet the whole family's interest such as on Netflix.

The ecosphere of a recommender system features multiple stakeholders—e.g., suppliers of items (i.e., products and services), users, platform provider—with multiple and possibly diverging interests and objectives. Thereby, recommender system providers are in a position to control the system, and hence, the items recommended. As a consequence, a recommender system provider may influence a recommender system regarding his own objectives, which may vastly differ from the users' interests or other stakeholders' interests. In cases with strong negotiation power by item suppliers (e.g., major labels in the music industry), item suppliers may be in a strong position to shift the control to their side (e.g., in the music industry, the repertoire by one label may only be provided for 'favorable' conditions such as its repertoire's items being preferably handled in the recommendations.

Overall, the involved stakeholders in a recommender system have access to information with respect to the recommender system (e.g., user preferences, available items, item consumption details, item characteristics) in different degrees. In short, there is an information imbalance with information being distributed unequally among the stakeholders. For instance, the recommender system provider has information about the entire supply and the data that is exploited in the course of computing recommendations. Each user, in contrast, has information about his or her demand and preferences, about the purpose of the demand and his or her background, for example, in terms of earning capacity. Given this information imbalance, none of the stakeholders has full information, every stakeholder has only partial, imperfect information. Moreover, each of the stakeholders has interest in not disclosing certain information. At the same time, every stakeholder has possibilities—limited possibilities, though—to obtain further information from, for instance, outside sources. For example, in one scenario, the recommender system provider may control the information that he provides users with. For example, the provider may fully neglect certain items that might have been useful to the user, but do not fulfill the provider's objectives.

In such a scenario, the user has comparably limited influence on the recommender system, namely by his or her behavior. For example, the user may fully

trust one recommender system and its 'best fitting' recommendations, or he or she can also obtain information from other recommender platforms or receive additional information on suiting items from other users.

The example of information imbalance that we discuss in this paper is only one of many examples in which one of the stakeholders may exploit the system, possibly at the expense of the other stakeholders. In the light of such unfair and biased circumstances, we—as a community—have to raise the following questions regarding the fairness and ethical aspects regarding recommender systems and their role in our everyday lives:

- Who is responsible for granting every stakeholder the possibility to receive what he or she wants and/or needs?
- How can we establish an equilibrium that best satisfies every stakeholder?
- Is it the responsibility of one stakeholder to ensure that the other stakeholders (or some of them) can fulfill their needs by considering their objectives (e.g., by ranking specific items higher in the recommendation list)?
- Ho can personalization approaches provide fair recommendations such that they are, for example, able to serve all user groups equally well?
- To which extent may we use recommendation approaches that privilege certain items (e.g., popularity bias)?

These are questions that have yet to be investigated. They have to be examined from various angles and need interdisciplinary research for pushing research on and solutions for 'ethical recommender systems' to the next level. This requires joint effort from researchers of computer science, information systems, economics, psychology, together with policymakers, and practitioners. For instance, the field needs the pivotal knowledge about technical capabilities of algorithms and their computational implications. While psychology may deliver the methods and results to investigate the individuals perception and information behavior, economics researchers may investigate the implications from a societal perspective. Besides research, policymakers and practitioners should be integrated in research and development endeavors right from the beginning. We stress that knowledge and efforts from all these fields are necessary for being able to making 'ethical recommender systems' a reality.

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Educational Technologies - The need to relearn how to ride a bike

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***Abstract*—The implementation of blended learning on university level turned out to be challenging. Social factors like the role of students and teachers in adopting new didactic concepts but also technology innovation cycles and digitalization in general influence success of blended learning approaches. In our research project, we identified these factors and based on them provide some insights on how to cope with the challenges.**

Keywords—Blended learning, technology innovation cycle, didactics, technology adoption

I. INTRODUCTION

The implementation of blended learning approaches has become a common request for universities [1], [2]. It seems to be the approach, allowing integration of technologies without losing direct contact with students [2], [3]. However, in our research project on the implementation of educational technologies in a bachelor's degree programme, we identified several challenges in switching to blended learning environments. We put a special focus on analyzing both students' attitudes and their performance in a blended learning setting to get a holistic view on this topic. The use of technology in teaching should help to prepare content in a target-group oriented way and to use the high affinity of students towards new media and digital content [1]. It is often overlooked that the integration of new technologies also implies changing demands on students and lecturers [4].

II. CHALLENGES AND FACTORS

Students who are to develop their own content within the framework of blended learning courses often feel overwhelmed at the beginning. Especially when they have experienced traditional forms of teaching and learning in their previous educational careers. These classical forms of teaching prepare the contents in a well-structured way and clearly convey which contents will be the subject of the examination. The exam is taken at a defined point in time and the student has completed this part of the training positively by passing the exam [5].

In the area of project-oriented, interactive teaching, which is usually understood as the basis of blended learning concepts, we take away the scaffolding and see whether the building stands on its own. Students should be able to deal with the content independently (or at least more independently) and draw conclusions from it. As a result, they should transfer the knowledge to a new context and solve complex problems [5].

This "letting go" also leads to uncertainty on the part of the teacher. The (supposed) control over the content learned by each individual no longer exists. A new understanding of the concept of learning and knowledge transfer is necessary. The networking of individual knowledge elements and the consideration of the context in which knowledge is applied is becoming increasingly important in order to be able to understand the complexity of reality and to shape it [6], [7].

Teachers are also challenged to develop a didactic concept from the multitude of technological possibilities that fits the content, the students and the given context [6]. This innovation process is often driven by technology - courses are continuously adapted based on new technological possibilities. However, the procurement of hardware and software is a simple step compared to the effort involved in integrating a new technology into a course and preparing the teaching content appropriately [7].

The innovation cycles of the technology turn very fast. Often faster, then the adjustment of a course is possible. Courses are offered once or twice a year. It takes one to two years to evaluate an implementation, implement improvements and compare the results. During this time the market for Educational Technologies has grown rapidly again and the technical possibilities have changed [8]–[10].

Compared to conventional teaching methods such as a textbook, a blackboard and chalk, which have been considered standard technology for decades and centuries, the current situation creates confusion. We therefore need a new set of methods and technologies that can be understood and practiced by teachers and students [5].

We also need evidence about the improvement of learning performance through new technologies. More technology is not necessarily better; as a study we are currently conducting shows. Students appreciate the personal interaction, sometimes demand the classical lecture as a form of teaching to get a good overview of the requirements of the course [2].

The digitalization of teaching can therefore only exist in a situationally appropriate combination of new technologies and good didactic methods. The core of a course must consist of well-prepared content. The "what", the contents of the course, must not be guided by technology trends. However, lectureres must also motivate themselves to rethink the "how", the forms of knowledge transfer, and not to avoid technology in the classroom out of convenience.

Young people's forms of learning have been different since childhood than those of previous generations. If universities do not anticipate this, teaching will be a compulsory exercise for students and a university degree a signal of suffering and endurance, not of technical and methodological knowledge.

III. Prerequisits on University Level

Universities have very good prerequisites for an attractive learning experience. Students are on site, in the classrooms. This can create interaction, experience projects, establish contact with practitioners; in short: universities can be a laboratory in which students can develop and apply their skills. Creating such an inspiring learning environment can be a difficult challenge for lecturers, yet constantly ask students to solve such challenges [1].

Universities will also have to face this change at the institutional level and create framework conditions that do justice to this change. For example, forms of knowledge verification must be adapted to these changes in order to achieve a fit. Furthermore, a teaching load can no longer be equated with the number of hours a lecturer spends in a classroom.

The role of the teacher is fundamentally changing, they are no longer knowledge providers, they do not have to carry all the knowledge that students need. Rather, they become moderators of the learning process, coaches of interested students, and ultimately curators of content that - made possible by Educational Technologies - is extensively and well-prepared and available online. University teachers must also become ambassadors of change and motivate our colleagues to participate in this process, to contribute to change and to engage in discussion. We need to leave behind a considerable part of our well-trained routines, "unlearn" them and develop new routines - in short, we need to relearn how to ride a bike.

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The Role of CSR in the ICT Industry

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***Abstract*—Information and Communication Technology (ICT) plays an important role in the current economic situation. Companies operating in the ICT industry are often seen as innovators and forerunners, which many other companies imitate. This not only holds for technology adoption, but also for the adoption of certain concepts guiding business conduct, such as Corporate Social Responsibility (CSR). This project aims at identifying how companies operating in the ICT industry adopt CSR by analyzing their responsibility reports. In particular, we investigate the strategic direction of CSR through the measures that have been implemented to assess the importance of CSR.**

Keywords—ICT Industry, CSR, corporate sustainability, sustainability reports

I. INTRODUCTION

The importance of corporate social responsibility (CSR) for demonstrating responsible business conduct has been widely discussed [1]–[3]. In some industries (e.g., producing companies), adoption seems to be more likely, as some studies suggest [4], [5]. CSR on strategic level requires that the company invests into specific measures (e.g., awareness building) and is willing to change processes, structure and strategic direction [6]. As not all industries have the same preconditions, some seem to be more prone compared to others [7]–[9]. The ICT industry – producing hard- and software, but also including consulting and services – has been described as the driver for innovation and digital transformation [10], [11]. Due to its importance, the ICT industry is often seen as a forerunner, mimicked by other industries. Yet, in the adoption of CSR the picture remains unclear [4]. Thus, with this research project, we aim at closing the gap and investigate how the ICT industry adopts CSR by analyzing sustainability reports of the leading ICT companies worldwide.

II. RELATED RESEARCH

Corporate Social Responsibility (CSR) has been discussed in various ways. Among the most prominent models is the so-called 'pyramid of CSR' [2], [12], describing four different responsibilities of CSR: economic, legal, ethical and philanthropic. Economic responsibilities subsume all efforts to be profitable, which has often been discussed as basic responsibility. Legal obligations are responsibilities set by laws and regulations, related to the context (e.g., geographically) companies relate to. Whereas these lower-level responsibilities seem to be a precondition for any business, above these two reside the more voluntary responsibilities, ethical and philanthropic [2]. Over time, this voluntariness found ground in many different concepts and a general definition of CSR. For this study, we defined the term CSR as "voluntary corporate activities that go beyond legal compliance whatever a company's motivation might be" (e.g., [4], [13]–[16]). This definition subsumes a general approach to address corporate social responsibility as a voluntary but excluding any moral or ethical obligation. However, this definition does not clarify the content of CSR.

CSR, in general, has been seen to cover the three pillars or dimensions of corporate sustainability: economic, ecologic and social (e.g., [16], [17]). The economic dimension clearly relates to the economic and legal level of the CSR pyramid [13], [16]. However, the ecologic and social dimensions are not only related to the upper two parts (i.e. ethical and philanthropic). Environmental and social activities do pay off for companies, hence contribute to the economic dimension [1], [17], [18]. Research in this area has shown that particularly the integration of CSR into corporate strategies influences companies' success [6], [19], [20]. However, only a long-term strategic approach, integrated into the general strategy of companies seems to be beneficial [20], [21], [XX]. Reporting in the area of CSR has become a vivid instrument to communicate with customers and stakeholders [9], [22], [23]. Hence, to demonstrate their efforts and document their approach to CSR, companies publish reports, either on their company website or on platforms such as the General Reporting Initiative (GRI) [23], [24]. The GRI platform in 2015 held approximately 24,000 reports from different organizations with specific schemes for different industry sectors [25].

Industry sectors seem to have different impacts on the general adoption of CSR [4], [5]. The ICT industry seems not only to be influential but also adopts a very specific approach to corporate sustainability and corporate social responsibility, as the concept of Green Information Technology (IT) has been lengthily discussed in this context [26]–[28]. In general, research and practice is differentiating between the greening of IT and greening by IT. The latter is often addressed as green information systems, i.e., information systems (IS) able to reduce the negative environmental impacts of businesses [28], [29]. Related to the term greening of IT is mainly the question, how IT products – hard- and software – can be designed in a way to reduce negative environmental impacts along their lifetime [30]–[32]. Many of these issues in most countries are regulated by laws and regulations, hence force companies to obey [4], [31]. Beyond these regulations, companies in the ICT sector often adopt voluntary activities based on a general CSR approach [4]. However, research on how and what to measure for demonstrating their efforts towards CSR has rarely been researched and mainly focuses on performance indicators [33].

With this study, we hence aim at identifying how the ICT industry adopts CSR by analyzing sustainability reports of leading ICT companies worldwide. In particular, we aim at collecting and categorizing measurement methods as well as factors influencing the measurement (e.g., input data).

III. Methdological Approach

To answer the research question, we rely on methods related to content analysis [34]. We first develop a codebook and coding sheet to increase objectivity and reduce individual bias. The development is based on a thorough literature review and follows some general guidelines to assure the validity of the instrument [34]. Next, we define our sample, including the sample size. The population consists of all companies in the ICT industry. To identify the population, we rely on a standardized coding scheme for industry categorization (e.g., NACE). We select an adequate number of the population as our sample based on well-established company rankings (e.g., Fortune 500). We assume that highly-ranked companies act as role models in the industry, hence we start with selecting top-ranking industry leaders. Next, we detect and download their CSR and/or responsibility report for further investigation. We assume that this is a valid basis for identifying measurements related to CSR in the ICT industry.

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Green IT and Extended Producer Responsibility

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***Abstract*—Companies, producing hard- and software, are not only forced to be innovative and produce stable information technology but are also challenged by societies' increasing demands to provide environmentally friendly products. Greening of IT – i.e., making hard- and software more environmentally friendly – is a first step to tackle these issues. However, due to the long and complex supply chains in particular when it comes to hardware production, what remains unclear is who should take over responsibility in case of any environmental harm caused. Although Corporate Social Responsibility covers all impacts from companies, other concepts for adopting responsibility exist, among them extended producer responsibility. In this study, we aim at investigating the possibility to integrate Green IT and Extended Producer Responsibility for a more holistic approach towards responsibility for environmental impacts evolving from hardware production throughout the whole lifecycle.**

Keywords—Green IT, Extended Producer Responsibility, Corporate Social Responsibility, E-Waste

I. INTRODUCTION

The ICT industry, particular the hardware producing industry, and the concept of green - i.e., environmentally friendly - information technology (IT) is directly related. In particular greening of IT [1]–[3] means making IT hardware more energy-efficient and improve modularity for prolonging the lifecycle of devices. However, from a holistic point of view, the whole life cycle of IT hardware can be improved to make it environmentally friendly. Especially at the end of the lifecycle when IT hardware becomes e-waste, the responsibility of the manufacturers has already been discussed (e.g., [4]). From a holistic point of view, accepting responsibility for the hardware companies produced would require integration of corporate social responsibility (CSR) and extended producer responsibility (EPR) into the strategy of companies related to the lifecycle of products. With this study, we would like to demonstrate possible factors influencing the integration of Green IT and EPR into CSR along the product lifecycle.

II. BACKGROUND INFORMATION

When talking about Green IT, it has been distinguished between greening of IT and greening by IT. Whereas greening by IT (or green information systems – green IS) focuses on how information systems may support organizations in their efforts to becoming more environmentally friendly (e.g., by measuring CO2 emission or information systems to manage general waste) [3], [5], greening of IT aims at directly changing hard- and software towards less negative ecological impacts. [6]–[8]. Although some laws and regulation influence greening of IT [7], [9], society asks for more. In particular, since there have been reports in the media revealing that computers at end-of-life are dumped in developing countries, where the harm environment and threaten peoples' health [10]–[12]. Some hardware producing companies already have shown, how they aim at accepting their responsibility [13]. Directly related to the product is the so-called extended producer responsibility (EPR) (as in [4], [14]–[16]). EPR is defined as "a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product" [17]. Whereas the end-of-life of products seems to be very directly related to EPR, not all lifecycle phases – i.e., design, resource use, production, shipping, product use – seem to be considered the same way [17]. In particular, in long and complex supply chains or supply nets, a shift from individual producer responsibility to a shared responsibility has often been discussed [4], [18]–[20]. Even sharing the responsibility with the customer [21], [22] has been discussed. However, in currently a clear picture is missing, as in supply networks different laws and regulations influence the behaviour of supply chain partners [19], [20]. The concept of Corporate Social Responsibility (CSR) has often been seen as a possibility to incorporate different stakeholders under one policy beyond legal obligations [2]. Although CSR is a voluntary concept (e.g., [9], [23]–[26]), supply chain partner may mutually influence each other by setting up according agreements [27]–[29]. CSR adopts a holistic point of view to tackle economic, ecological and social issues [26], [30]. By integrating CSR on the strategic level, value for all participants may be created [31]–[33]. By integrating not only supply chain partners, but all stakeholders it is possible creating shared value for the companies and society accordingly [34]. Hence, the goal of this study is to identify possibilities to integrate Green IT and Extended Producer Responsibility for a more holistic approach towards responsibility for environmental impacts evolving from hardware production throughout the whole lifecycle.

III. RESEARCH DESIGN

In order to reach the above-claimed research goal, we will conduct a literature review to identify similarities and differences between the concepts. We already started by first reviewing the literature on IT hardware lifecycle, mainly relate to product footprints and life cycle assessment (e.g., [35]–[39]). We came to the conclusion, that five phases (design, resources, production, use, end-of-life) are clearly distinguished whereas the role of transportation varies. For

example, for calculating a product footprint for IT hardware [35], transportation plays an important role. Interestingly the first and last phase of the lifecycle have been investigated extensively. In the beginning, the idea of eco-design (e.g., [8]) plays an important role, aiming at a design that makes the product easy to repair or recycle. At the end-of-life, general aspects of waste management (reuse, reduce, repair, recycle) have been discussed intensively (e.g., [12], [40]). We are about to finish this part soon. As a next step, we will look into the literature on green IT, EPR, CSR and shared value to further answer our research question.

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Smartphone Addiction in Numbers

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***Abstract*—The smartphone has become a ubiquitous device, used by almost everyone. It has features beyond calling people, such as browsing the internet, listening to music and playing games, to name just some. It can be said that in the developed world, almost everyone owns and uses smartphones. Besides its advantages, smartphone use seems to have negative physical, social and psychological impacts. Research indicates that a certain type of addiction may be obtained related to excessive use of the device. However, current research has mainly investigated the users' perception, e.g., surveys. We aim at advancing this research by using log-file data, collected from smartphone users. In particular, we aim at comparing perceived and actual usage behaviour, focusing on addictive behaviour (number and length of usage), applications used as well as security and privacy issues (e.g., passwords, fingerprint readers, camera events). We rely our work not only on psychological aspects of usage, but relate it also to existing usage models, often used to explain actual usage behaviour.**

Keywords—Smartphone Addiction, Addiction, Social Impact, Privacy, Security, Usage behavior.

I. INTRODUCTION

Due to the pervasive use of smartphones in the context of digitalization, society is alarmed as this seems to be observing a new addiction [1], [2]. In the media lately, some physical effects evolving from extensive smartphone use have been discussed, leading to the creation of the word "Smombie" – a combination developed from the words Smartphone and Zombie [3]. This describes people looking always on their smartphone without recognizing the environment. Physical impacts evolve from an unnatural hunched posture [3]. However, addiction to a technology like the smartphone has not only physical but also psychological effects. It influences the individual belief system leading to a perceived psychological dependency [1], [2], [4], [5]. People showing addictive behavior overrate the utility of the according technology and are hardly able to rationally assess their technology usage [1], [2], [6]. This may have different effects such as ignoring security mechanisms or privacy issues, the fear of missing out messages or the feeling of being 'naked' without the smartphone [1], [6]. Current studies integrate technology usage models, e.g., the technology acceptance model (TAM) [7] to address inflated beliefs and the influence on actual use [6]. Models to describe and explain technology acceptance and actual use are mainly related to utility (perceived usefulness) and usability (perceived ease of use), as described in TAM [7]. The unified theory of acceptance and use of technology (UTAUT) [8] identifies performance and effort expectancy, social influence and facilitating conditions as being influential on behavioural intention and use behaviour [8]. But also environmental variables (gender, age, experience, voluntariness of use [8]) are influencing use behaviour, mainly explaining normal use of technology.

What differentiates addictive use from normal use is hard to identify. Clearly, technology addiction is a phenomenon of behaviour, rather than dependency on chemical substances [9]–[11]. Due to the lack of taking chemical substances, some researchers even argue that with technology the term pathological use is more appropriate [12]–[14]. However, as symptoms and treatments of substance and technology addiction are similar, for our study we will use the term smartphone addiction. Technology addiction in our case is related to "nonchemical (behavioural) addictions that involve human-machine interaction" [14]. It is characterised by "a psychological state of maladaptive dependency on the use of a technology to such a degree that … typical behavioral addiction symptoms arise" [1]. The symptoms include a shift of focus on the smartphone, ignoring the environment, biased decision making and distorted beliefs and perceptions [1]. Although the research on technology addiction has addressed several areas like social media [4], [11], online auctions [1], online gaming [15] or mobile apps [2]. However, what remains unclear is whether the addiction (or dependency) is related to the device (i.e., Smartphone) and its functionalities or specific parts of it (i.e., online games). First attempts already exist [6], but there is room for further research.

II. RESEARCH DESIGN

The research project is based on a two-step analysis. In an already published study [6], we investigated how smartphone use and smartphone addiction are related. Based on evidence from prior research, we addressed biased reasoning as the influencing factor (e.g. [1]). Based on the idea of technology addiction, we assumed that perceptions of addicts towards the artefact are modified and distorted. In this prior study, we assumed that this influences usage and acceptance of technology (i.e., smartphones). We developed a setup where we on one hand used a questionnaire to collect data. On the other, we asked participants to allow access to their smartphones to capture log files in an anonymized way for comparing their questionnaire answers with actual smartphone usage. Whereas the first part (related to the questionnaire) has already been analysed and published [6], the second part (log file analysis) is currently not finished.

To further investigate actual use related to biased reasoning, we collected data directly from the device (i.e., the smartphone) of some of the participants. In particular, we want to identify how people use their smartphone and how this relates to their own observation. We expect that users showing addictive behaviour underestimate both: usage time (how often) and usage length (how long per use). These are the variables investigated, operationalized by matching them with

events identifiable from log files. From the log files, we are able to identify some events, such as looking at the smartphone (e.g., to check the time) without any further action, starting and stopping applications (apps), using the browser, checking emails and so on.

III. Current State

Currently we work on eliminating some technical issues related to new versions of the smartphone operating systems (Android), changed security mechanisms and controlling for bias. We have developed a basic research model, relating variables the construct biased reasoning and have operationalized some variables in terms of events. However, at the current state we are not finished with this conceptualization and hope that with the help of experts in this workshop we will be able to proceed further.

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Social Media Marketing and CSR

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***Abstract*—The role of social media for companies has increased tremendously. From being a tool mainly for the individual to an instrument to directly address people and communicate with them in accordance with their needs related to user behaviour. As social media platforms constantly collect information from their users, marketing directly shaped for the target audience or even the single individual has become possible. However, the unstructured use of Facebook, Twitter and so on without any strategy and unrelated to the current social media maturity might blur the results. Companies, just jumping on the social media bandwagon experience massive drawbacks. However, even social media marketing done properly may lead to negative publicity as companies may harm their reputation by ignoring responsibilities they have confessed to. In particular Corporate Social Responsibility, respecting social, environmental and ecological responsibilities, has been stressed as being harmed by social media activities. Hence, this proposal tries to integrate social media marketing and CSR, in particular regarding the possibilities of CSR to increase trust, loyalty and reputation of companies in the context of social media.**

Keywords—Social Media, Social Media Maturity, Corporate Social Responsibility, Responsibility, Privacy.

I. INTRODUCTION

The term 'social media' has become the embodiment of relationships of individuals with each other (social) in a digitalized world based on internet technologies (media) [1]. Decentralized, worldwide digital connectivity – i.e., the internet – allow people to stay in touch, no matter where they are. In addition, the term Web 2.0 further specifies functionalities provided via Internet technology allowing development and communication of content generated by users (UGC) [1]. Companies have adopted and used the possibilities evolving from the technology to generate value [2] from it by advertising their products, increase the relationship with users and improve customer loyalty on social media platforms [3]–[6]. In addition, users have been involved via social media to develop products, support other customers or rate services [2], [4], [6]–[8]. Furthermore, companies expect to gain in-depth insights into their customers' needs by using social media platforms [9]. This is one of the concerns users often expose: being transparent to an extent they cannot control [10], [11]. Companies risk losing their reputation by being too greedy regarding users' data or when negative feedback from the community evolves [8], [12]. Negative feedback, however, is not only related to privacy issues, but also evolves from bad product reviews, sloppy support activities or simply when users experience the companies' social media activity not fulfilling their expectations [12]–[15]. Research and business, both, agree, that social media activities to pay off have to be addressed from a strategic perspective to adopt a structured approach related to their social media maturity (e.g., [8], [16], [17]). This means, social media marketing strategy and corporate strategy have to be aligned [18], [19]. Alignment means in addition, harmonizing all activities of the company towards one goal [18]–[20]. This is valid for all companies, but in particular when companies adopt a certain responsibility for their business activities [21]–[23]. This adoption of responsibilities is often referred to the term corporate social responsibility (CSR), integrating social, environmental and ecological responsibilities of companies [24], [25]. By incorporating CSR into their strategy, companies agree on following certain ethical guidelines due to various reasons [21]–[23], [26]. As among companies' responsibilities is "to be profitable" [27], CSR is not an end in itself but fulfils several functions [26], [28]. To fulfil this responsibility, companies have to follow the ethical guidelines they established to increase their reputation [21], [23], [26], which clearly may fire back. For example, companies have been accused of not being honest and doing only 'greenwashing' [29]–[31]. However, CSR, covers in addition to ecological and environmental issues also social issues, such as working conditions, fair payment but also responsibilities for data collected [32]–[36]. By adopting CSR as a holistic framework influencing the company as a whole, it clearly has an influence on social media marketing. As it has been shown, guidelines for responsibilities are a vivid part to address social media maturity [16]. Based on this current situation, we aim at investigating the role of CSR for social media marketing, in particular regarding trust, loyalty and reputation.

II. RESEARCH PROCESS

Achieving the research goal requires a multi-step research design, as knowledge in this area is scarce. First, we aim at conducting a structure literature review [37]–[39], focusing on social media marketing and companies' responsibilities. The idea of the literature review is not only to capture the state of the field and identify existing knowledge of CSR and social media marketing. Even more, it allows analysing open issues, identifying research gaps and developing an a-priori model or at least setting a research agenda. In parallel, we collect data from social media platforms, in particular Facebook and Twitter. To be more specific, we observe the accounts of selected companies, analyse their communication and try to make sense of it. We focus on identifying and defining 'cornerstone activities', i.e., activities related to responsibility, reacting on critical feedback or news addressing specific issues (e.g., privacy breaches, greenwashing activities). Hence, a longitudinal approach is required, as effects of communication are hard to be assessed in a short period of

time. We plan observing the channels for at least 6 months. In a pre-study, we experienced at least two cornerstone activities per month, followed by user interaction lasting for about one month. As a third part, we aim at interviewing companies' representatives and social media users, to gain event more insights into the underlying assumptions and reflect users' perception. In particular, we plan approaching both 2 – 4 weeks after a cornerstone activity, based on the user interaction related to the cornerstone activity. We aim to develop a model showing the role of CSR in social media marketing. The research process is sketched in Figure 1.

Figure 1: Research Process

III. Open Issues

The described-above research process is the first draft and consequently leaves some issues unsolved. First, we have to further define how to identify cornerstone activities. Currently, we have already developed some criteria, but have to further define them. Furthermore, we have to control for external events, that might influence our longitudinal observation, such as a general trend towards social media reluctance as well as political or legal changes in some countries. Also, we have currently not decided how to identify possible interview partners and are discussing the content of and rationale for the interviews. Based on a brainstorming session, we think exposing the results to them (i.e., the cornerstone activities and the ongoing discussion) may bias their answers. However, without addressing both the interviews may not provide any interesting insights. As we aim at developing a model, we are still not sure how to integrate the quantitative and qualitative results into one concise model.

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The Role of Affordances in ICT4D

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***Abstract*—Information and communication technology for development (ICT4D) aims at identifying possibilities on how developing countries use technology for the better. Technology-related affordances are directly related to the situation the people live in and cannot just copied from what we already know in the western world. Therefore, this research aims at identifying the role of affordances in ICT4D by investigating the people using technology in developing countries.**

Keywords—ICT4D, digital divide, affordances, sub-saharan Africa

I. Extended Abstract

Mobile communication and the pervasive Internet are making a dream of many come true: information transmission in real-time, beyond borders of space and time. However, this technological dream is a nightmare for some – those who are suffering from negative impacts of ICT. Problems are manifold, including global issues like Digital Divide, E-waste, security breaches and cybercrime. But also personal issues like privacy breaches and technology addiction [1-4]. If and how ICT influences developing countries are questions, which have found interest in IS research. Clearly, the role information systems play in developing countries differs from the situation in the industrialized world [5, 6], due to various circumstances. The geographic, economic and political situation are some important factors, influencing deployment and adoption of ICT and mobile communication. Long distances, harsh weather conditions and unstable political systems hinder the development of a solid infrastructure [7]. Electricity, roads, wired lines – preconditions for mobile communication and ICT usage – do hardly exist or are on much lower standards compared to Europe or the US. Thus, investments in infrastructure projects are vital for further development especially in rural areas in developing countries [8]. Moreover, people suffer from diseases, hunger, war, unemployment and illiteracy; life expectancy is low and childhood mortality high; access to schools and higher education is almost not available in rural areas [9, 10]. Governmental and non-governmental organizations developed different approaches to improve life in developing countries. In 2015 the United Nations (UN) formulated so-called 'Sustainable Development Goals' to "end poverty, protect the planet, and ensure prosperity for all" [9]. Goal 9 covers topics like industry, innovation and infrastructure and clearly states that by 2020, affordable access to ICT and information has to be reached in least developed countries [9]. Existing studies in the context of ICT4D (Information and Communication Technology for Development) investigated the so-called 'digital divide' as a gap between those people who have access to information (or technologies) and those who have not. It has been shown, that various forms of the digital divide exist, not only related to the developing world. There is a spatial digital divide, which means access to information is easier for people living in cities compared to rural areas [11]. An age-related digital divide in terms of younger people are more likely to have access compared to aged people [12]. Differences in Internet access of developed and developing countries have been referred to as global divide [13]. This has been referred as social divide or the "gap between information rich and poor in each nation" [13].

Access to information technology and information can be mental, material, skills and usage related [14]. Whereas the material access is related to the physical possibility to use a computer the other three are closely related to the individual personality and history of the user (or non-user) [14]. However, in developing countries all four access types shape, how information systems are used [14]. Some researchers tend to use the term digital inequality, which is "the access and use of information and communication technologies" [15]. For all those who want support developing countries or run a business there, these considerations are very important. Clearly, implementing the very same technologies widely used in the industrialized world in developing countries could cause harm. For example, the implementation of a personal computer requiring constant energy supply could lead to conflicts between those who need the energy for other facilities (e.g. refrigerators). Thus, considering these circumstances when developing information systems for developing countries is vital. Initiatives, like 'One Laptop per Child' [16] started with the very same considerations and built information systems fittings the needs of the potential users (robust, light, consuming low power, wireless connectivity, cheap) [16]. Besides charitable initiatives, many ICT companies adopted their business to the requirements in developing countries. Telecommunication providers, for example, offer their services even in isolated regions. Due to the lack of fixed lines, they had to implement wireless technologies. Therefore, some technologies that are not widely used in the industrialized world are successful in developing countries, e.g. WiMAX (Worldwide Interoperability for Microwave Access) [17]. This technology allows wireless data transmission over rather long distances with high bandwidth rates [18].

Sub-Saharan Africa (African countries south of the Sahara) is not a monolithic structure in terms of political systems, economic growth and welfare. This also effects the use of information systems in this area. Concerning Mobile-cellular and Internet penetration rates, they have grown strongly, but the divide between the rich and the poor is growing [19]. Whereas in some areas of sub-Saharan Africa, the Internet is well deployed, others are merely deserted. The ratio of those who have Internet access in sub-Saharan Africa it is about 21 % compared to about 82 % in developed

countries [19]. The Internet connection speed in most parts of Europe, the US and Russia is above 10 Mbps or even higher [20]. In sub-Saharan African countries like Namibia with an average of 2.3 Mbps and an adoption rate of 10 % for above 4 Mbps IPv4 networks, decreasing to 0.6 % for above 10 Mbps IPv4 networks [20] it is much lower. Interestingly, mobile communication speed is slightly higher (3 Mbps on average in Namibia) (Akamai, 2016). Compared to Europe or the US, mobile communication in Africa is often faster, e.g. in the Democratic Republic Of The Congo, page load time of websites of regular broadband is around 9.5 seconds whereas mobile communication networks can do the same task in 6.5 seconds [20]. Furthermore, in Africa with more than 15 % of the world population, only around 29 % (approx. 341 million people) use the Internet, compared to approx. 54 % Internet usage in the rest of the world [21]. Not only speed and access vary, but also costs, services, content and skills of people [19]. It is also interesting, that devices and applications differ from what we know in the industrialized world [22, 23]. Mobile phones for example, provide less functionality but more stability [22, 24]. The mobile phone does not have a lot of smart features as we are used to, but is a very important tool for mobile payment [25]. For some people, the only way for transferring money in a fast and stable way [26]. A well-known example is M-PESA, which changed mobile payments in Kenya [26].

As sketched above, understanding the needs and knowing the preconditions towards information systems in developing countries is important for all initiatives as well as companies. With this research project, we want to contribute to a better understanding concerning needs and preconditions for successful adoption of information systems in sub-Saharan Africa. In particular, we want to know what the needs of users of ICT (e.g. mobile phones) in sub-Saharan Africa are. To answer this question, we aim at identifying the needs from at least two sides: customers and companies. Since most companies run their own investigations concerning needs of customers, we hope to gain insights into their considerations. Companies also can inform about preconditions (in terms of infrastructure) required to enable ICT use in sub-Saharan Africa. In addition, we will run a series of interviews with customers of the services, to identify their needs, especially needs which have not been satisfied so far. A survey among customers to have both - qualitative and quantitative data - is also possible. As a third pillar, we are thinking about the involvement of NGOs in sub-Saharan Africa, which could provide another point of view, enriching the knowledge concerning needs and preconditions.

In the field of ICT4D research, the concept of affordances is a common choice as theoretical underpinning. Sein et al. even stated “that bringing Affordances into the ICT4D field would help to better understand the role of ICT” [27]. In general, the concept of affordances is a way to describe how actors (people or animals) interact with the environment, i.e. objects in their world [28]. More precisely, it constitutes interaction opportunities of an actor with an object and/or the environment [29]. The relationship between the object and the actor shapes the perception and implementation [29]. It has been argued, that the actors notice and adopt information related to their needs, making affordances specific per actor [30]. However, the actor is not always a single human being (or animal), but also collectives (like companies) which have a goal in common interact with the objects in a specific way [31]. In the field of information systems research, the concept of affordances is quite popular. It has been used to clarify relationships between social media and social transformation movements [32], work practices and innovation [33] or IT systems and organizational systems [34]. We will use affordance theory as the basis for our research.

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