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Understanding the Processes of Online Creative Interaction – Toward a Research Agenda

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Abstract. There is currently a strong belief in Information and Communication Technologies' (ICT) ability to enable innovation. However, there is little knowledge about the creative processes that may occur through the mediation of ICT and consequently lead to innovation. Prior studies have shown that creativity is central when studying innovation and that creativity can be seen as a social process. Since computers often are used as mediators for human communication and as a social tool, ICT harbors a potential to enable the social processes of creative interaction. The aim of this paper is therefore to map key concepts and research that relate to online creative interactions. Hence, prior research in the IS field regarding creativity is presented, the concepts of computer-mediated communication and creativity are explored and a possible case to study is suggested. Subsequently, a research agenda is outlined, followed by some methodological considerations and a reflection on the expected knowledge contribution of the research.

Keywords. Creativity, online, interaction, computer-mediated communication, ICT, research agenda.

1 Introduction

Information and Communication Technology-enabled innovation is often presented as a silver bullet that will solve many of the problems that the world is facing today. For instance, the European Commission has prioritized this matter in their *Europe 2020 Initiative* where they want to turn Europe into an "Innovation Union" (European Commission, 2013). They also argue that "Information and Communication Technologies underpin innovation and competitiveness across private and public sectors and enable scientific progress in all disciplines" (European Commission, n.d.). Accordingly, there is a strong belief in Information and Communication Technologies' (ICT) influence on innovation. However, the question can be raised if ICT actually supports innovation, and if so – how?

Innovation is closely related to the concept of creativity. Creativity can be defined as the production of new, original and useful ideas, whereas innovation can be defined as the implementation of these creative ideas, which in turn means that creativity is a prerequisite for

innovation (Amabile, 1988). Furthermore, creativity is often seen as a social process where interaction is a core idea (Fischer, 2013). According to Fischer (2013), social creativity stems from the activities between people and artifacts, and their respective knowledge and information. An assumption here is that knowledge is socially distributed (Berger and Luckmann, 1967), which may be interpreted as that the "pieces of the puzzle" are scattered; people have a variety of knowledge, information, competencies and perspectives and so on, that can feed into a creative process. In this conceptualization of creativity as a social and interactive process, ICT hypothetically harbors a great potential to summon these distributed competencies. This could in theory facilitate social creativity by online interaction and communication, but the questions remain if and how this works in reality.

There are already many online activities where people jointly and voluntarily create things. Some examples include Wikipedia where people are authoring and editing wikis and crowdsourcing where people are helping each other to solve problems, design products and finance projects by sharing ideas, voting and tagging, and so on. But there is little knowledge about the creative processes that may occur in these kinds of online environments and how they function (Seidel et al., 2010). The research problem that I am trying to outline here is that we do not know enough about how the processes of creativity are enacted online (ibid.).

The aim of this paper is therefore to map key concepts and research that relate to online creative interaction. Hence, the paper does not contain an exhaustive or systematic literature review or theoretical framework, but should rather be perceived as a browsing of possible research areas and concepts to be included in a later review and framework. From delineating these concepts and areas, the intention is to propose a research agenda for my future work including relevant research questions and the planned knowledge development of the research.

The outline of the paper is as follows; in the first section called *Related research*, prior research in the IS field regarding creativity is presented and the concepts of computer-mediated communication and creativity are defined. In the next section, a possible case to study is suggested. Subsequently, a research agenda is outlined, followed by some methodological considerations and, finally, a reflection on the future research knowledge contribution is presented.

2 Related research

In this section I will start by presenting prior research on creativity within the field of information systems (IS), followed by a presentation of computer-mediated communication and socio-technical systems. Then, I move on to define creativity, social creativity and adjacent concepts.

2.1 Prior research in the IS field

The topic of creativity can be related to several research areas within the IS field. Since creativity is seen as a social phenomenon here, it can be connected to areas such as Computer Supported Cooperative Work (CSCW) and e-collaboration (Farooq et al., 2008). CSCW focuses on people working in groups and how computer solutions can support their work and

group dynamics (ibid.). Another research area that connects to creativity is Human-Computer Interaction (HCI). Candy and Hori (2003) suggest several lines of research within HCI that relates to creativity, i.e. creative work flow, creativity support tools and e-communications, amongst many. Furthermore, creativity and IS can be linked to knowledge management systems and social media (Ford and Mason, 2013) and knowledge creation and information technology (IT) (Wagner et al., 2014). There are also research areas such as crowdsourcing (see for example Howe, 2009) and cultures of participation (Fischer, 2013). Hence, there is much IS research that touch upon subjects that are similar or adjacent to creativity, however, there is not much research that more directly focuses on creativity from an IS perspective. This is elaborated in the next section.

As mentioned in the introduction, the concept of creativity is central when studying innovation. Although many creative processes seem to occur online, there has been fairly little research in the IS field regarding creativity (Seidel et al., 2010). In a literature review on creativity research within the IS field, Seidel et al. (2010) analyzed twenty-seven research articles published between 1977 and 2009 in eight top-ranked IS journals. In their analysis they found that IS research on creativity mainly have focused on the creative process and product, but has left out the context in which the creative process is enacted. Furthermore, the research has focused on the level of the individual and the group, leaving out organizational aspects and how different levels interact. Creativity research within IS has also put much attention to the role of the IT artifact, where the tool view and ensemble view (Orlikowski and Iacono, 2001) are the most common conceptualizations. Seidel et al. (2010) argue that the tool view mainly has been used to study how IT artifacts affect individuals' or groups' creative abilities and processes, with an emphasis on productivity and information processing. The ensemble view, on the other hand, has been used to study the role of creativity in IS development processes (ibid.).

Prior research has employed both qualitative and quantitative approaches (Seidel et al., 2010), but with a tendency towards quantitative and especially experimental designs to investigate the IT systems' impact on the creativity of individuals and groups (ibid.). The research results have mainly focused on trying to explain and predict the phenomena. From this literature analysis, Seidel et al. (2010) come to the conclusion that:

> [F]uture IS research on creativity must (1) theorize about the socio-technical context in which creativity unfolds—a challenge that will require the application of a variety of qualitative research methods in order to investigate the complex interplay of creative persons, products, processes, and (IT enabled) contexts at the individual, group, organizational, and market levels. This understanding can then (2) inform the development of IT artifacts that can nourish the creative process (p. 235).

This can be seen as an important recommendation for future IS research on creativity. Although this suggestion is extensive, it highlights the importance of looking at the socio-technical context in which creative processes can take place and also on the interplay between different factors within this context. Although we often need to narrow down the focus of our research to make it manageable, we should still include enough factors to be able to see the interplay between them in the socio-technical context. This could be one way forward toward filling the gaps that are identified by Seidel et al. (2010).

2.2 Computer-mediated communication

In this section, I present two concepts to exemplify how processes of online creative interaction may be approached. First, the concept of computer-mediated communication (CMC) is introduced and after this, I outline the main ideas of socio-technical systems to elaborate on technical and social factors that can influence CMC.

In the field of CMC, researchers study the relationship between ICT and social interaction and interpersonal communication (Thurlow et al., 2004). CMC can be defined as "a process of human communication via computers, involving people, situated in particular contexts, engaging in processes to shape media for a variety of purposes" (December, 1997 in Thurlow et al., 2004, p. 15). Thurlow et al. (2004) point out that communication always is mediated, that is, that we need a medium of some kind to transmit the communication. Examples here can range from nonverbal acts to spoken language, and pen and paper to ICT, such as laptops or smartphones. The authors also emphasize that communication has been mediated by technology for hundreds of years, e.g. through handwriting, paper press, the telegraph and so on. However, CMC focuses on the computer as a medium, and in particular the "computing technology which more explicitly facilitates human communication" (Thurlow et al., 2004, p. 20). The concept of 'computer-mediated' can be further narrowed down to meaning mediated by the Internet or the Web. Hence, CMC focuses on social interaction and interpersonal communication that are mediated by computers that facilitate human communication through the Internet and the Web (ibid.). In light of this definition, it can be argued that CMC could be a useful concept that may inform online creative interactions.

The context in which the CMC is enacted is influenced by an array of technological and social factors (Thurlow et al., 2004). For instance, the type of channel used enables different modes of communication, e.g. e-mail and websites are mainly text-based whereas videoconferencing enables audio-visual and perhaps also text- and graphics-based communication. Moreover, the channel affects if the interaction is synchronous or asynchronous. CMC can be public or private, that is, interpersonal, enacted in a small group or as mass communication, and the communication may be moderated or not. The context is also affected by social aspects such as the characteristics and the number of participants, e.g. if the communication is one-to-one, one-to-many or many-to-many. Other important factors are the relationships between participants, e.g. if they are personal or professional, and if the communication is long-term or short-term. The participants' attitudes towards CMC, their level of experience of it, and the purpose and topic of the communication also affect the context and the communication (Thurlow et al., 2004). To conclude, the context in CMC can be formed and influenced by numerous factors, which in turn possibly could affect the opportunity for creative processes to occur. Furthermore, Thurlow et al. (2004) argue that communication is about the "*negotiation* of meaning between people" (p. 17, emphasis in the original) and that the meaning of a message is dependent on the context. As creativity can be seen as a social process where new meaning is negotiated (i.e. in the form of new and useful ideas), the context in CMC can be seen as an important aspect to study when researching online creativity. This would also mean that research investigating online creative interaction has to take both technical and social aspects into consideration, which I will elaborate on in the next section.

2.2.1 Socio-technical systems

Larsen et al. (2014) describe STS as a system that is divided into subsystems; i.e. technical, social and environmental subsystems. The technical subsystem contains devices, tools and techniques that transform input to output. The social subsystem includes people and their knowledge, competencies, values, attitudes and needs but also the interrelations between people. The environmental subsystem can be seen as the surrounding context, e.g. factors outside of the technical and social subsystems that affect the relations within the other subsystems. For instance, this can be formal and informal regulations and actors. The key idea to STS is that the performance of a system depends on the interdependency between the subsystems. This means that the technical subsystems, e.g. artifacts, are dependent on the social subsystem, e.g. how people use the artifacts, while at the same time people are influenced by the design of artifacts. The combination of different subsystems and their features and practices lead to unpredictable and unanticipated forms of organizing (Zammuto et al., 2007). Hence, my standpoint is that the practices in a certain context are the result of the interplay between technical, social and environmental features. I therefore suggest that when looking at online creative interactions, STS could inform the conceptualization of the phenomenon.

Connecting back to CMC, it is clear that socio-technical aspects are emphasized there too. Thurlow et al. (2004) state that "new ways of communicating through the internet are evolving and emerging all the time in response to both technological *and* social changes" (p. 31, emphasis in the original). They argue that it is important to bear in mind:

> (1) what the technology is supposed to do (i.e. its design and commercial ideologies); (2) what the technology allows people to do (i.e. its practical and material affordances); and (3) what people actually do with the technology (i.e. its uses and gratifications) (Thurlow et al., 2004, p. 43).

Whereas the concepts outlined above help to characterize part of the phenomenon of online creative interaction, it does not shed any light over the creative processes. This is elaborated on in the next section.

2.3 Creativity and adjacent concepts

Creativity has been studied in fields such as psychology, pedagogy, sociology, history and organizational studies (Williams and Yang, 1999). This diversity has produced an abundance of definitions and perspectives on the concept. One definition that many authors agree upon is that creativity is the creation of new, original and useful ideas (Isaksen and Ekvall, 2010; Oldham and Cummings, 1996; Sternberg and Lubart, 1999; Woodman et al., 1993). Amabile (1996) presents an elaborated version of this definition:

> Creativity is the production of novel and useful ideas in any domain. In order to be considered creative, a product or an idea must be different from what has been done before. (Few creativity theorists hold the strong position that a creative idea must be completely unique.) But the product or idea cannot be merely different for difference's sake; it must also be appropriate to the goal at hand, correct, valuable, or expressive of meaning (p. 1).

The definitions of creativity can be divided into four categories; person, process, product and environment (Kampylis and Valtanen, 2010; Seidel et al., 2010). Within the first category, researchers focus on individual abilities, personality, traits, motivation and thinking styles. The process category concerns intentional activities such as problem solving, knowledge retrieval, idea associations and the like. The third category investigates the product, i.e. the outcome of a creative process, which can be tangible or intangible. The last category concerns the context in which creativity occurs, that is to say the relationships between people and the environment, artifacts, culture, leadership etcetera. These categories have been studied on individual, group and organizational levels and it has also been studied how these levels are interdependent (Woodman et al., 1993). In this paper, it is argued that IS researchers should focus on creativity from a process and contextual perspective and these arguments are founded on the idea that knowledge is distributed and that a social process of problem solving, idea association, knowledge retrieval and creation can outperform the individual. The contextual aspect of creativity is also especially interesting in the field of IS as much human interaction takes place online and through CMC today.

Some research on creativity has focused on the social interactions within creative processes. Fischer (2000, 2013) proposes the concept *social creativity* and argues that creativity stems from activities within a social context in which interaction with other people and artifacts, that represent collective knowledge, contribute to the process. He builds on the assumption that the knowledge of one single individual is limited and that collaboration and interaction between individuals are crucial. He therefore suggests that social creativity is facilitated by *cultures of participation* where people can actively participate in personally meaningful discussions and problem solving, e.g. through social computing, social media etcetera. Fischer (2013) also argues that social creativity and cultures of participation are especially important since they provide possibilities to solve complex problems for which knowledge is distributed and for systemic problems where collaboration between people with diverse knowledge is needed. Social creativity and cultures of participation can be facilitated in socio-technical environments "by making all voices heard, harnessing diversity, and enabling people to be aware of and to access each other's work and ideas, relate them to their own, and contribute the results back to the community" (Fischer, 2013, p. 209).

2.3.1 Additional concepts

There is a wide range of concepts that are adjacent to creativity and social creativity. Auernhammer and Hall (2014) have compiled constructs and models that permeate the research areas of knowledge, creativity and innovation. This list is extensive and includes many interesting theories that could inform the topic of online creative interaction, e.g. communities of practice, social networks and online communities, information-based systems, learning systems, distributed knowledge systems, open and co-creating systems, systems of shared meaning, sensemaking (ibid.), perspective taking and perspective making (Kane et al., 2009). These concepts can inform IS research on creativity, provide different ways to approach online creative interaction and could be of use in future conceptualizations, frameworks and analyses.

3 Possible case to study

This section introduces a case that could be interesting to study, related to the phenomenon described in prior sections. The case described below is not mentioned by name, which is why there are no references in these paragraphs. The information is gathered from press releases by the company and non-scientific articles from online journals.

The proposed case is a global company that provides security solutions in over 50 countries around the world and that have implemented a social intranet for internal knowledge sharing and networking. The aim of the intranet is to improve the level of knowhow, accelerate information processes and increase efficiency and communications. This in turn is thought to increase growth and profitability, why the intranet is seen as a business tool. The company is flat and decentralized with 300 000 employees and they consider their work to be knowledge intensive. They have a wide range of customers, from small to large organizations in a diverse set of business sectors. Because of this distributed character of the organization the social intranet is supposed to function as a hub where local knowledge can be used globally and in other local markets. The organization is also acquisition-driven and acquired companies can join the social intranet even though other IT systems might not be merged with those of the parent organization.

Before the implementation of the social intranet, the user requirements were investigated through 200 interviews in 26 countries and an online survey with 1500 respondents in 39 countries. This research period lasted six months and aimed at building an intranet that fit the users' needs and requirements on content, functionality and usability. The goal was to provide an easy and intuitive user interface that was tailor-made for the organization. The social intranet was launched 2010 and initially 4 300 users from 43 countries were given access.

The social intranet can be characterized as an internal, global website with a combination of wikis, forums, blogs and a network similar to Facebook, where all content is user generated. The platform also contains a traditional intranet function where information is centrally distributed, e.g. from management. One of the functions; wikis, is used as knowledge repositories for information about the business area, different market segments and costumer segments, and users are allowed to search, edit and add information in these. The diversity on the intranet is extensive with 25 official languages and 45 percent native English speakers. The content is therefore tagged in English, which makes it possible to find search results even though the original information is in another language. Whereas the wikis are fact based knowledge repositories, blogs are another type of arena where employees can share their knowledge, but in a more personal way. Here people can write about their experiences and reflections. Another function in the intranet is the possibility to create groups and networks around projects, shared interests or for people who work with the same customer but in different countries.

This case can be construed as an online community in which social interaction and communication occur and consequently, in which social creativity may occur. A social intranet can be conceptualized as both technical and functional. From a technical perspective an intranet is an internal network and set of web technologies that are cut off from external access through the use of software, such as a firewall (Boettcher in Newell et al., 2001). From a functional perspective the intranet can be seen as the network services provided for users,

i.e. access to information, navigation, communication and collaboration (ibid.). Consequently, a social intranet would provide many technological and social aspects that affect the context.

4 Research topic

So far, this paper has mapped key concepts and research areas that can inform the research topic. The sections above have been used as thinking tools to generate questions that could be interesting to study. Hence, a proposed research agenda can be formulated as follows:

- The aim is to study how the processes of online creative interaction can be understood and how it can be facilitated.

This aim can be broken down into three research questions:

- How are the processes of online creative interaction enacted in practice?
- Under what conditions do the processes of online creative interaction occur in practice?
- How can the processes of online creative interaction be facilitated?

The first research question focuses on the activities performed by participants in the computer-mediated context; i.e. what do they do, how do they interact and communicate and how do they make use of artifacts and tools? Furthermore, how do these activities emerge through the interdependency of technological and social aspects?

The second research question aims at identifying strengths and weaknesses that affect the possibility for online creative interaction to occur. What inhibitors and enablers can be found? And how do these relate to the socio-technical interdependency?

The third research question aims at producing a more abstracted and generalizable knowledge about how online creative interactions can be influenced and facilitated. What similarities, differences and common denominators can be found between the studied cases and what do they teach us?

5 Methodological considerations

In this section, a brief reflection on methodological aspects will be made. First, a process approach on how to study creative interaction is presented, followed by a short description of the concept of netnography. Finally, the concept of novelty is problematized.

Sawyer (2012) suggests a process approach when studying creative interaction since this can provide detailed information and understanding of the interaction processes. He argues that this approach calls for qualitative methods and that the interactions should take place in real-world situations, i.e. not staged situations such as laboratory interactions or experiments. The process approach does not focus on the individuals' thoughts and actions in isolation, but Sawyer (2012) points out that the discursive context have to be taken into account. This approach can be contrasted to an input-output approach that is more focused on what happens before and after the interaction takes place, e.g. what variables lead to what creative outcomes (Sawyer, 2012). Since the process approach emphasizes creative interactions, it can be

considered more suitable to study processes of online creative interaction, whereas an input-output approach is not suited to answer the research questions.

Examples of research methods that could be used are observations of online interactions which can be complemented by interviews with participants. This can be compared to the concept of *netnography* suggested by Kozinets (1998). Netnography is basically ethnographic fieldwork methods that are applied to study online cultures and communities. Data can be gathered through participant observation and interaction with the online community and its members. This method also meets the conditions set up by Sawyer (2012), e.g. it is possible to study the process of interaction in a real-world setting.

However, before getting out on the field, one key aspect of the methodological considerations is the operationalization of creativity and the creative process. Going back to the definition in the introduction of this paper, creativity was defined as the production of new, original and useful ideas (Amabile, 1988). But how will one identify what processes are producing something new or not? Tanggaard (2013) argues that creativity often has been represented as "a radical rebellion against present and existing social structures" (p. 21). Hence, when we talk about creativity we tend to think of great achievements and groundbreaking discoveries. But Tanggaard's point is that "[c]reativity is an everyday phenomenon resulting in continual processes of 'making the world'" (p. 21). She continues to say that:

> …creativity is less a rebellion against limitations present in the current world than it is a type of adaptation and response to the possibilities and barriers with which we live in this ever-changing world (Tanggaard, 2013, p. 26).

Another way to approach novelty is presented by Sele (2012). She concludes that new technological concepts are established and justified through rhetorical arguments, i.e. that the old concepts are discursively marginalized from new concepts. Hence, what is considered new or not is constructed discursively. This means that researchers can approach novelty as 1) everyday emergence that takes place all the time and everywhere in varying degrees and as 2) discursively constructed.

6 Knowledge contribution

In this paper, a research problem, aim and questions have been proposed as a research agenda. To tie things up, I also present the knowledge contribution that the research could result in. The proposed aim of the research is to develop an understanding of the processes of online creative interaction. A further aspiration is to be able to theorize around this process and how it emerges in the interdependency between technological and social aspects that form the context. By theorizing about these issues, this can hopefully also inform future practices and design to facilitate online creative interaction.

Looking a bit closer at the proposed research questions presented above, the knowledge contribution of the research could be descriptive, classifying and prescriptive. The first question is mainly characterizing and descriptive as it aims at studying how the process of social creativity is enacted. Here, the objective is to interpret and describe the process. The second question increases the level of abstraction as it aims at identifying inhibitors and

enablers, strengths and weaknesses, technological and social aspects, and thus, hopefully, the research can provide classifying knowledge about the phenomenon. Finally, the third question is future oriented since it focuses on facilitation of online creative interaction. The knowledge that hopefully can come out of this is of a prescriptive and design-oriented character and on a more generalizable level.

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