People-Driven, ICT-Enabled Innovation: Crowdsourcing

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Abstract

Crowdsourcing reflects the idea that a firm or a person, in an effort to solve specific problem(s), seeks voluntary help from the general public via an open call, by utilizing the available information and communication technologies (ICT). Such description accentuates two central assumptions. Firstly, while recent advances in ICT have enabled novel and innovative applications of crowdsourcing; it is by no means a post-Web phenomenon. In fact, examples of inviting unknown crowds to participate in solving a challenge have been around for centuries. Secondly, crowdsourcing is a multi-faceted and complex phenomenon where social, technological and economic forces are at play; and as such, any attempt at understanding crowdsourcing while ignoring such complexity can be misleading.

The objective of this dissertation is to contribute to the accumulating body of knowledge on crowdsourcing, both at organizational and individual levels of analysis, with the following broad questions in mind. How has complexity research aided organization scholars to theorize about innovation in general, and what could crowdsourcing researchers learn from this line of research? To what extent does the crowd represent a threat to professionalism, and to what extent could organizations exploit this threat as a source of opportunity? What factors motivate the crowd to repeatedly participate in crowdsourcing services? And as the time passes, what makes them discontinue their participation?

These four questions, respectively, have guided the research efforts reported in the four articles included in this dissertation. Together, these four articles provide a holistic and multi-perspective understanding of crowdsourcing. From an organizational perspective, articles I and II – predominantly conceptual (theoretical) in nature – identify the key characteristics of organizations as complex adaptive systems, and provide a theoretical foundation for crowdsourcing as a sourcing strategy that enhances organizational survival chances. Then, from an individual perspective, articles III and IV provide an interpretive understanding of the use lifecycle of crowdsourcing systems. Based on a longitudinal empirical investigation of a popular crowdsourcing platform, these two articles report on: a) the key factors responsible for attracting members of the crowd to adopt the said technology; b) the key factors responsible for driving them to continuously use it for extended periods of time; and c) the key factors responsible for them to discontinue using it. The thesis concludes with a discussion of the key theoretical and practical contributions, as well as the limitations and directions for future research.

Acknowledgements

Despite the fact that the cover page of this dissertation bears only a single name, in reality it is the culmination of concerted efforts of countless contributors who (knowingly or not) encouraged, supported and challenged me to improve. I dedicate the next few lines to those without whom this milestone in my eventful journey could not be celebrated.

First and foremost I wish to express my special appreciation and thanks to my advisor Professor Virpi Kristiina Tuunainen, you have been a great mentor for me. I would like to thank you for believing in me even in times when I was in doubt. Knowing that you were always available for advice gave me the confidence to work independently and to seek help when needed. I learned a great deal from you as a teacher, advisor and co-author. Virpi, I will forever be indebted to your invaluable guidance on both research and career fronts.

I would also like to thank my thesis pre-examiners Professor Tero Vartiainen from Jyväskylä University and Associate Professor Ioanna Constantiou from Copenhagen Business School. Their excellent feedback and suggestions have helped me improve the quality of this manuscript significantly. Furthermore, I would like to thank Associate Professor Ioanna Constantiou for agreeing to act as my opponent in my public defense.

I have been privileged to be part of a collaborative and supportive work environment at Aalto's Information and Service Economy unit. I am especially grateful to Professor Matti Rossi for having an open door and for all the constructive feedback he has given me. I would also like to thank Professor Timo Saarinen for the educating experience I had while acting as a teaching assistant in his course, and for all the interesting discussions we had before and after classes. Additionally, I would like to thank Dr. Johanna Bragge for the positive comments she gave on my early work; her constructive comments reassured me that I am on the right track. I would like to thank my friend and classmate Juho Hamari for all the meals and drinks we shared during our intellectual battles and debates. Furthermore, I wish to thank my colleagues Hendrik Hielkama, Meri Kuikka and Pentti Launonen for the voluntary time they took to read my work and for their valuable feedback.

My research endeavor has received tremendous support from other units as well. I am grateful to the HSE Foundation and Aalto Service Factory for the financial grants that allowed me to dedicate my full attention to research and

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II. Soliman, W. (2013): Crowdsourcing as a sourcing strategy for the ambidextrous organization, in the *Proceedings of The XXIV ISPIM Conference - Innovating in Global Markets: Challenges for Sustainable Growth Conference* held in Helsinki, Finland on 16 to 19 June 2013. ISBN 978-952-265-421-2.

III. Soliman, W., & Tuunainen, V. K. (2015). Understanding continued use of crowdsourcing systems: An interpretive study. *Journal of Theoretical and Applied Electronic Commerce Research*, *10* (1), 1–18. doi:10.4067/S0718-18762015000100002.

IV. Soliman, W., & Tuunainen, V. K. (Unpublished). *Understanding use discontinuance: Interpretive study of a volitional mixed system.*

PART I: SUMMARY

1 Introduction

The object of interest in this dissertation is crowdsourcing, defined in the Merriam Webster Dictionary as the practice of obtaining needed services, ideas, or content by soliciting contributions from a large group of people and especially from the online community rather than from traditional employees or suppliers. Although the term crowdsourcing was only introduced in 2006 with a clear emphasis on the role the World Wide Web plays in connecting and interacting with the crowds (Howe 2006); the idea of orchestrating members of the general public to generate and capture value has been around for centuries. For example, what we know today as the Oxford English Dictionary was in fact a crowdsourcing project that started in the late nineteenth century – laypersons were invited to submit paper slips, each containing an English word and its definition – and was successfully completed 70 years later (Lanxon 2011). A more recent, and probably more recognized, example of crowdsourcing before the pervasiveness of Web adoption is the ABC reality TV show, America's Funniest Home Videos (www.AFV.com), which has been airing since 1989. AFV is fundamentally based on the (crowd)-sourcing of humorous videos captured by members of the general public, with the purpose of broadcasting this video content on the ABC network. Nevertheless, there is no arguing that recent advances in information and communication technologies (ICT), particularly Web 2.0 technologies, have increased the possibilities offered by crowdsourcing to a variety of organizations and domains. Thus, modern time crowdsourcing is most often facilitated by an ICT supported platform, through which an organization extends its reach for ideation or problem solving capabilities by integrating the crowd (Afuah & Tucci 2012).

Research investigating the crowdsourcing phenomenon has increasingly been gaining popularity over the past years. As Figure 1 shows, year 2006 witnessed the publication of a single article mentioning the term 'crowdsourcing', while in 2014 alone more than 600 academic articles have tackled it. In an effort to

produce a comprehensive definition, Estellés-Arolas and González-Ladrón-de-Guevara (2012) reviewed more than 200 definitions of crowdsourcing and concluded that crowdsourcing is a type of participative online activity in which a firm proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task.
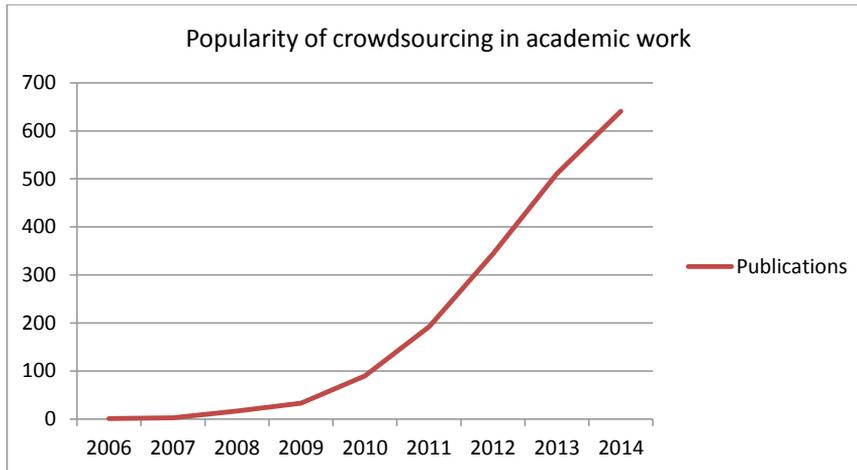
Figure 1 Chart showing the popularity of the term "crowdsourcing" in 'peer reviewed', 'scholarly journals' between 2006 and 2014, according to the ProQuest database

Early research aiming to classify the different types of crowdsourcing efforts distinguishes between two types based on the nature of contributions: integrative and selective (Schenk & Guittard 2009). *Integrative crowdsourcing* is complementary by nature in that a single contribution has very little value on its own, but the overall value stems from the large amount of input the crowd generates. Examples of this type include text digitization services (e.g., DigiTalkoot and reCaptcha), and community-based navigation platforms (e.g., OpenStreetMap and Waze). *Selective crowdsourcing*, in turn, implies that members of the crowd are sought to provide solutions to a particular problem or a task, and that the seeker organization may choose and reward the best contribution(s). In this form of crowdsourcing, contributions are competitive in nature, meaning that the seeker expects that someone in the crowd will deliver an optimal solution, and that single solution will be rewarded. A well-known example of this crowdsourcing type is Innocentive with its business model centered on announcing science problems and soliciting solutions from the crowd, while charging a fee from the seeker (Jeppesen & Lakhani 2010).

Another approach to classify crowdsourcing is based on the perspective of recurrence of the crowdsourcing task(s) (Soliman & Tuunainen 2015a). This approach distinguishes between two different models: non-recurring and recurring. The *non-recurring task model* covers crowdsourcing efforts in which the crowd's contributions are sought for a single - or limited number of - task(s). This model was exemplified by the *Netflix Prize*. Netflix (the Web-based on-demand media streaming service) sought help from the crowd to solve a single non-recurring challenge related to its recommendation system algorithm. On the other hand, a firm that seeks help from the crowd to fulfill frequently occurring assignments represents the *recurring task model*. Content crowdsourcing in the media industry (news media particularly) exemplifies such approach. The CNN-run iReport platform for instance, allows the crowd to submit and publish content online on a continuous basis. Professionals from CNN can then go through all the submitted content and select reports that are suitable (e.g., confirmed breaking news) for airing on the various CNN platforms. Table 1 lists a number of crowdsourcing examples categorized according to the two dimensions of recurrence and contribution.

Table 1 Crowdsourcing examples based on task nature and recurrence

CONTRIBU-TION	*RECURRENCE*	
	Non-Recurring (One-Off)	*Recurring*
Integrative	*Iron Sky:* Crowdsourcing & funding of a motion picture (http://www.ironsky.net). *DigiTalkoot:* Crowdsourcing project to digitize the National Library of Finland (http://www.digitalkoot.com).	*Recaptcha:* Crowdsourcing platform for text digitization and human verification (http://www.google.com/recaptcha). *Waze:* Crowdsourcing platform for community-based navigation information (http://www.waze.com).
Selective	*Netflix Prize:* Crowdsourcing of a recommendation system algorithm (http://www.netflixprize.com). *Finnair's Quality Hunters:* Crowdsourcing of service development ideas (http://www.qualityhunters.com).	*CNN's iReport:* Crowdsourcing of news and content (http://www.ireport.cnn.com). *Innocentive:* Crowdsourcing of solutions to science problems (http://www.innocentive.com).

1.1 Positioning of the research

Scholarly work on crowdsourcing may be categorized into three categories, each adopting a slightly different perspective on crowdsourcing: (a) focus on

the IT artifact; (b) focus on the seeker organization; and (c) focus on the individual solvers. These three perspectives roughly correspond to three research streams respectively: the computer science research stream, the organizational studies research stream, and the participants' behavior research stream (Schlagwein & Bjørn-Andersen 2014).

First, the *computer science* stream adopts a technology-focused orientation, and is chiefly concerned with the technological side of the crowdsourcing phenomenon and devising new applications. Examples in this stream include work related to designing IT artifacts that could be utilized to improve crisis management (Okolloh 2009) and urban planning (Chon et al. 2013), which emphasize incorporating spatial information (e.g., GPS data) with human inputs (e.g., reporting). Another interesting application is the so-called 'games with a purpose' (or GWAP) which covers a range of technologies designed to allow people, while playing computer games, to unknowingly solve large-scale problems (von Ahn 2006; von Ahn & Dabbish 2008). While this stream generates very valuable knowledge and inspiring prototypes, it usually neglects the non-technical aspects of crowdsourcing (e.g., human, organizational and societal) and lacks sufficient theoretical foundations that organizations and IS scholars may utilize and build upon (Schlagwein & Bjørn-Andersen 2014).

The second research stream is *organizational studies* which focus on the organizational level of analysis. This steam is chiefly concerned with investigating how organizations may gain value from utilizing the crowd. The underlying assumption here is that crowdsourcing serves as a form of open innovation; a paradigm most notably known for reminding organizations that not all the smart people work for them (Chesbrough 2003), and that competitive advantage often comes from *inbound open innovation*, or "the practice of leveraging the discoveries of others" (Chesbrough & Crowther 2006, p. 229). For instance, Majchrzak and Malhotra (2013) conceptualize crowdsourcing – being an approach to open innovation – as the public generation of innovative solutions (e.g., new product and service) to a complex challenge posed by the seeker organization. In fact, the crowdsourcing literature abounds with studies illustrating how organizations may make use of the great ideas generated by the participating crowds. For example, Starbucks launched its *MyStarbucks Idea* as a social media platform where members in the community (i.e., solvers) were encouraged to propose ideas, promote innovations and give feedback on forthcoming products (Gallaugher &

Ransbotham 2010). Similarly, Dell launched its *IdeaStorm* to engage its wide user base in search of ideas to help Dell regain its market position (Di Gangi et al. 2010). Also the Finnish airline Finnair co-created new service ideas with an online community in its *Quality Hunters* campaigns (Jarvenpaa & Tuunainen 2013). While the open innovation theoretical lens undoubtedly provides a crucial starting point to theorize about how organizations may employ 'crowdsourcing for innovation' (Majchrzak & Malhotra 2013), it is nonetheless a limited one. Reducing crowdsourcing to simply and solely a method for collecting ideas for new product and service development, disregards a broad range of possibilities that crowdsourcing can offer to organizations. Examples of crowdsourcing beyond the ideation domain are numerous, for instance, *sharing economy* represents a form of crowdsourcing that is based on facilitating the sharing of the crowd's underutilized assets (e.g., accommodation sharing on Airbnb; and ridesharing on Uber) for monetary and non-monetary benefits (Cohen & Kietzmann 2014). Likewise, *crowdfunding* represents a form of crowdsourcing where members of the crowd are sought for their evaluative decisions and monetary support (e.g., seeking investment on Kickstarter) that enable organizations to generate new products and services (Ordanini et al. 2011). Yet another example is *content crowdsourcing* which signifies the disrupting role the general public plays in reshaping the media and journalism industry (Väätäjä et al. 2011; Soliman 2013; Paton 2012; Soliman & Tuunainen 2012).

The third research stream is *participants' behavior* which focuses on the individual level of analysis. It is dominated by a quest to tackle the question of what motivates the crowd to participate in crowdsourcing endeavors. The underlying assumption here is that the success of any crowdsourcing service is first and foremost dependent on attracting and maintaining an actively participating crowd who is willing to use the crowdsourcing platform/IS (Soliman & Tuunainen 2015a). Thus, organizers of such platforms need to provide the right mix of incentives that match the participants' motivations (Leimeister et al. 2009). Theories of motivation (Ryan & Deci 2000b; Deci et al. 1999; Brief & Aldag 1977; Jones & Mawhinney 1977) are commonly used in this line of research. The study of motivation is concerned with the processes that give behavior its energy (i.e., strength) and direction (i.e., aim), and at its core strives to answer how motivation affects behavior's initiation, persistence, change, goal directedness, and eventual termination (Reeve 2008). This research stream convincingly explains that participation in crowdsourcing is

driven by motivational factors that are both intrinsic (e.g., fun and enjoyment) and extrinsic (e.g., monetary rewards and publicity) in nature (Brabham 2008; Ebner et al. 2009; Leimeister et al. 2009; Antikainen et al. 2010; Väätäjä 2012; Zheng et al. 2011). However, this research stream is dominated by cross-sectional studies adopting a static view on both the participation behavior and the underlying motivational factors driving it. Neither does it address what explains participation-discontinuance of crowdsourcing systems.

1.2 Objective and outline of the dissertation

Following the line of thought illustrated in the previous section, the main objective of this dissertation is to contribute to the crowdsourcing body of knowledge, in general, and more specifically, to the organizational and individual research streams. At the organizational level, the included articles – articles I and II – position crowdsourcing in innovation and complexity literature, and based on predominantly theoretical and conceptual treatment investigates *how and why organizations utilize the crowd as a resource*. At the individual level, the included articles – articles III and IV – position crowdsourcing in the IS adoption/acceptance/use continuance literature, and empirically investigates *what motivates members of the crowd to use a crowdsourcing system, and as the time passes, what factors lead them to discontinue using it*. Figure 2 illustrates the overall structure of the dissertation and the corresponding articles.

Organizational perspective

> (1) The complexity of innovation: An assessment and review of the complexity perspective [Forthcoming]

> (2) Crowdsourcing as a sourcing strategy for the ambidextrous organization [Published]

Individual perspective

> (3) Understanding continued use of crowdsourcing systems: An interpretive study [Published]

> (4) Understanding use discontinuance: Interpretive study of a volitional mixed system [Unpublished]

Figure 2 Structure of the dissertation

1.3 Key concepts

Considering the multi-disciplinary nature of this thesis' topic, some of the key concepts that I use may have different meanings and invoke different understandings depending on the reader's dominating area of expertise. Therefore, I dedicate this section to defining the central concepts that will be occasionally used throughout the thesis.

Innovation: While there exists many definitions for the term 'innovation', it can be simply conceptualized as the introduction of novelty or "new combinations" (Foster, 2000, p. 319). These new combinations are the root of economic evolution, and they can come in many forms, such as (1) introducing a new product; (2) introducing a new method of production; (3) creating a new market; (4) acquiring a new source of materials; and (5) carrying out a new organization of an industry, like establishing or breaking up of a monopoly (Schumpeter, 1943, in Tapsell & Woods 2010, p. 541).

Open innovation: Open innovation is defined as a paradigm that emphasizes "the permeability of firms' boundaries where ideas, resources and individuals flow in and out of organizations" (Dahlander & Gann 2010, p. 699).

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Organization: "A social system consisting of subsystems of resource variables interrelated by various management policies, practices and techniques which interact with variables in the environmental supra-system to achieve a set of goals or objectives" (Luthans & Stewart 1977, p. 184).

Complexity theory: Complexity theory, originally developed in the natural sciences, is an umbrella term that covers fields of study interested in studying complex systems; most notably, complex adaptive systems (Poutanen et al. Forthcoming; Schneider & Somers 2006). "Complex adaptive systems are everywhere in the natural world ranging from relatively simple organisms like viruses to ant colonies, to more sophisticated creatures like mammals" (Carlisle & Mcmillan, 2006, p. 3). Their complex adaptivity – the evolutionary and survival abilities – sets them apart from systems which are merely complex (ibid).

Complex adaptive systems (CAS): CAS are fundamentally composed of three core parts: (1) *agents* constituting the basic individual actors of the system, and depending on the phenomena of interest, agents can represent a wide variety of entities such as human beings, organizations, objects, or even concepts; (2) *interactions* capturing the mutually adaptive behaviors of agents and in addition are the most commonly observed structures in complex adaptive systems; and (3) *environment* which is the medium where agents operate and interact (Nan 2011).

Organization as CAS: From the complexity standpoint, organizations may be placed along a behavioral spectrum: ranging from *random* and *chaotic*, to highly *hierarchical* and *mechanistic*, and in the middle lie complex adaptive organizations. The latter represents a type of organizations that are "comprised of agents (people) who experiment, explore, self-organize, learn and adapt (in varying degrees) to changes in their environments. They exist at the individual, team, divisional and group level and also in a much larger web of external complex adaptive systems" (Carlisle & Mcmillan 2006, p. 3).

Organizational ambidexterity: Organizational ambidexterity is broadly used to describe an organization's ability to pursue two seemingly conflicting activities at the same time (Tushman & O'Reilly 1996; O'Reilly & Tushman 2004; He & Wong 2004). Similar to complex adaptivity (Soliman 2013), organizational ambidexterity reflects an organization's ability to achieve "alignment in its current operations while also adapting effectively to changing

environmental demands" (Gibson & Birkinshaw, 2004, p. 210). An organization possessing such capability is referred to as an ambidextrous organization.

IS use: The generic term 'information systems (IS) use' is commonly applied to refer to an activity (or behavior) involving the interplay between *users* (as subjects utilizing an IT system), *IT features* (as building blocks or components of IT artifacts), and *tasks* (as functions being performed) (Nan 2011, p. 506).

IS acceptance: Commonly refers to end-users' willingness (as opposed to rejection) to use an IS for the first time (Karahanna et al. 1999).

IS use-continuance: Refers to the usage behavior beyond the initial use stage (Soliman & Tuunainen 2015a), and describes behavior patterns that reflect the continued (i.e., repetitive) use of an IS (Hong et al. 2008).

IS use-discontinuance: Generally refers to a decision made by users to quit the use of a system and not go back to it (Turel 2014).

2 Assumptions and Methodologies

In doing the research leading up to the writing of this thesis, I believe that I adhere to a moderate interpretive position (Walsham 1995a; Walsham 1995b; Walsham 2006), acknowledge the existence of an independent reality at the ontological domain, yet I accept the relativism of knowledge as socially and historically conditioned, at the epistemological domain (e.g., Mingers, 2004). Most importantly, I assume a pluralist stance, and welcome the diversification of paradigms and research methods (Mingers 2004; Lee 1991; Tashakkori & Teddlie 1998). The remainder of this chapter is dedicated to clarifying this position.

2.1   Underpinning assumptions

The IS field, and the social and behavioral sciences in general, have been engaged in over three-decade-old debates about the worldview models – known as paradigms – that shape researchers' belief systems about reality and knowledge, and guide their methodological choices (Orlikowski & Baroudi 1991; Lee 1991). The two most dominant, and usually competing, paradigms are positivism (more generally empiricism) and interpretivism (more generally conventionalism) [1] (Mingers 2004; Tashakkori & Teddlie 1998; Lee 1991; Smith 2006).

Positivism is a school of thought that maintains that the methods of natural science enquiry are the only valid way of doing research. One of the main underlying assumptions of positivism is the existence of objective physical and social reality independent of humans, which can be apprehended and characterized by crafting precise measures (Orlikowski & Baroudi 1991).

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[1] Although positivism and interpretivism are commonly portrayed as the two dominant paradigms in social science research; they are not the only ones. For instance, the critical paradigm sets a foundation for research that is concerned with providing a critique to the status quo and challenging the prevailing assumptions (Orlikowski & Baroudi 1991; Myers & Klein 2011). It may be argued that while positivist and interpretive researchers aim at predicting and explaining the status quo respectively; critical researchers' aim is to transform it (Myers & Klein 2011).

Although post-positivist philosophies acknowledge the value-laden nature of science (Smith 2006); the positivist tradition is generally influenced by the hypothetic-deductive model of scientific explanation (Orlikowski & Baroudi 1991; Smith 2006), and typically views science as the "systematic observation of event regularities, the description of these regularities in the form of general laws, and the prediction of particular outcomes from the laws" (Mingers, 2004, p. 89). Therefore, positivist researchers' method of choice is often quantitative in nature; positivism typically underpins studies utilizing mathematical analysis, inferential statistics and experimental designs (Lee 1991).

Interpretivism, in contrast, adopts an explicit constructionist position – that is the belief that our knowledge of reality is a social construction, and hence incapable of being understood independent of the social actors (Orlikowski & Baroudi 1991; Walsham 1995b). Although this, in an extreme sense rejects the possibility of the existence of an independent reality; moderate interpretive positions (e.g., Walsham, 2006) would accept the stratification of reality (e.g., Mingers, 2004), which recognizes the existence of an independent reality at the ontological domain, yet is still bound by the relativism of knowledge as socially and historically conditioned, at the epistemological domain. The interpretive philosophy is premised on the epistemological belief that understanding of social processes requires immersing oneself in the phenomenon of interest and trying to understand the world of those who generate it. Walsham (2006) – quoting Greetz (1973, p.9) – offers a brief description of the interpretive view: "What we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to" (p. 320). As such, interpretive researchers construct interpretations of social actors' own interpretations that account for the way subjective meanings are created and sustained in a particular setting. Hence, interpretive researchers' method of choice is often qualitative in nature; that is, the use of qualitative data, such as interviews and documents, to understand and explain social phenomena (Myers 1997). Whereas "quantitative research codes, counts, and quantifies phenomena in its effort to meaningfully represent concepts" Gephardt (2004) points out, "qualitative research starts from and returns to words, talk, and texts as meaningful representations of concepts" (p. 455). This emphasizes the process of sense-making negotiated between the researcher and the researched aiming at reaching a shared understanding.

These two paradigms have attracted numerous proponents and opponents, and the debates that ensued amongst scholars in different disciplines have culminated in three major camps: imperialists, isolationists and pluralists (Mingers 2004). The first camp, *imperialists*, argues for the dominance of a single paradigm. For example, positivist imperialists view the methods of natural science "as the only truly scientific ones" (Lee, 1991, p. 350), and anything else is considered pseudoscience. The second camp, *isolationists*, accepts the reality that the two paradigms can co-exist, however, separate and independent of each other, forming two distinct schools of thought and targeting different audiences. Isolationists seem to have given up on abridging the conflict between the two paradigms and have reached the conclusion that the paradigmatic debate has become "unproductive" and needs to be "shut down" (Tashakkori & Teddlie, 1998, p. 4). The third and final camp, *pluralists*, accepts and welcomes the diversification of paradigms and research methods, and suggests that research should strive to be "trans-paradigmatic", and routinely combine diverse philosophies and research methods when appropriate (Mingers, 2004, p. 88). The pluralist camp, in my view, best describes my paradigmatic affiliation. Rather than acknowledging the co-existence of two incompatible paradigms, I embrace the assumption that there is a common ground between the different paradigms; they can strengthen each other, and build on one another.

Lee (1991) reconciles the seemingly irreconcilable (i.e., integrating the positivist and interpretive approaches) by proposing a framework for the stratification of understanding. The framework argues that knowledge (of phenomena) involves three different levels of understanding, building on one another: subjective understanding, interpretive understanding, and positivist understanding. *Subjective understanding* consists of the common-sense meanings and understanding in which human subjects make sense of themselves and their surroundings, which is also largely responsible for the behavior that emerges in their socially constructed setting. *Interpretive understanding* belongs to the observing researcher, as it describes the researcher's interpretation of the human subjects' subjective understanding; it may be described as the shared understanding that emerges between the researcher and the researched. Finally, *positivist understanding* is one that the researcher creates and tests with the intention to explain the empirical reality. The explanation positivist understanding seeks, is qualitatively different from both subjective and interpretive understandings because "it is

made up of constructs that belong exclusively to the observing researcher (as opposed to the observed human subjects) ... of which the observed human subjects might not be aware" (ibid, p. 351).
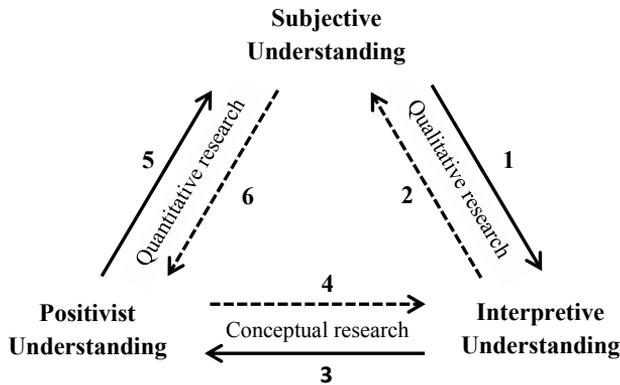
Figure 3 Integrative framework of understanding – Adapted from Lee (1991)

According to the integrative framework of understanding (see Figure 3), knowledge is a constantly evolving process that involves reciprocal interactions between three interconnected levels of understanding. The outer cycle (arrows 1 → 3 → 5) denotes that the subjective understanding provides a foundation for the interpretive understanding, which in turn provides a foundation for the positivist understanding. Based on this understanding, positivist researchers make predictions about the human subjects' actions. Since the framework acknowledges that the human subjects' actions are reflections of their own subjective understanding; predictions based on the positivist understanding may either be confirmed or disconfirmed by examining them against the subjects' actions. Disconfirmation of the positivist understanding would initiate the inner cycle (arrows 6 → 4 → 2) aiming at the refinement and improvement of positivist and interpretive understanding calling for a fresh reading of the subjective understanding. This in turn would provide a "basis to an improvement in the interpretive understanding (arrow 1), which would then provide the basis to an improvement in the positivist understanding (arrow 3), and so on" (Lee, 1991, p. 354).

Two central points can be realized from this framework. Firstly, the human subjects (and their subjective understanding) play a central role for both interpretive and positivist understandings, however, for different purposes. While interpretive understanding may be seen as a window crafted by the researcher into the subjective understanding to make sense of it; positivist understanding may be seen as efforts to systematically confirm or disconfirm

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interpretive understanding by formally testing its propositions against the subjective understanding. Secondly, the framework provides a way – though definitely not the only one – to map the extant research work on a particular domain into three categories: (1) research efforts utilizing the link between subjective understanding and interpretive understanding that is predominantly qualitative in nature (2) research efforts utilizing the link between subjective understanding and positivist understanding that is predominantly quantitative in nature; and (3) research efforts utilizing the link between interpretive understanding and positivist understanding that is predominantly conceptual (or theoretical) in nature.

2.2 Methodologies

Picking up from the integrative framework discussion presented in the previous section, this thesis is interpretive at heart, utilizing both qualitative and conceptual links, aspiring to improve existing – as well as generate new – interpretive understanding. While articles I and II may be categorized as conceptual (theoretical) research papers, articles III and IV are classified as qualitative (empirical) research papers. The four articles are intended to be read sequentially, and together they provide a holistic and multi-perspective understanding of crowdsourcing. Together, articles I and II provide a conceptual and theoretical foundation for crowdsourcing as a sourcing strategy, from an organizational perspective. Similarly articles III and IV together provide an interpretive understanding of the usage phenomenon of crowdsourcing as an IS artifact, from a crowd member/solver/user perspective.

2.2.1   Organizational perspective

Articles I and II are conceptual in nature and have been motivated by a quest to explicate how complexity theory was applied to explain the multifaceted nature of innovation, and to provide a theoretical foundation for crowdsourcing as a path to knowledge and expertise beyond organizational walls. Therefore, article I utilized a concept-centric systematic literature review methodology (Webster & Watson 2002). Two rounds of literature reviews were conducted on *"innovation"* and *"open innovation"*, with the *"complexity perspective"* in mind. The analysis process for the resulting publications was concerned with identifying the aim, theoretical framework, and key contributions of the research. Based on the content analysis, article I

identifies key lessons from the study of complexity in organizations and provides a number of practical implications supported by specific cases studied in the literature.

Article II adopts a narrower focus on crowdsourcing in the journalism context as an exemplary industry where organizations operating in it are under existential threat. The article's main objective is to provide a theoretically-driven discussion, supported by real life examples, on how organizations may utilize different forms of crowdsourcing strategies and how crowdsourcing could potentially become a source of competitive advantage.

2.2.2 Individual perspective

Articles III and IV are qualitative in nature, and have been motivated by a quest to investigate the factors driving the different phases of the use phenomenon of a crowdsourcing system, from the individual (i.e., crowd) perspective. It is with the methodological choices I made, the aim has been to produce a 'balanced qualitative research' (Pratt 2009) that (1) honors the worldview of informants, (2) provides sufficient evidence for the claims proposed, and (3) contributes to the extant body of theory.

The empirical setting of articles III and IV represents a crowdsourcing platform and mobile application called Scoopshot (www.scoopshot.com). The Scoopshot platform has been developed and run by P2S Media Group Inc., which was founded in April 2010 by a Finnish team, and is currently based in Finland's capital, Helsinki. Scoopshot is a crowdsourcing platform that facilitates and manages the trade of crowdsourced mobile user generated content (e.g., photos and videos), connecting media agencies (the seekers) with the crowd photographers (the solvers), with a revenue model based on a commission on each photo sale. The crowd photographers, or Scoopshooters, have complete volition to participate either by a) responding to a pre-set task by a seeker, or b) submitting content that they believe publishing-worthy. A submission may get compensated if it is chosen to be purchased by a seeker. Sold photos are typically used for publishing purposes in different visual media (e.g., TV, newspapers, online, etc.). The Scoopshot application has been installed by over 500,000 users across 177 countries. What makes Scoopshot an especially interesting research context, is that in the duration this research has taken place, the platform was run as a photography brokerage marketplace, and did not offer traditional within-community communication capabilities (e.g., voting, following, commenting, etc.). As such, Scoopshot

serves as a prime example of what Doan et al. (2011) refer to as non-community type of crowdsourcing platforms, where solvers do not necessarily form a networked community, but rather use a shared platform to solve a particular task or tasks. It was important to Scoopshot's management to emphasize that their niche should not be confused with traditional social media. They did not perceive themselves to be competing with other photo-based social media platforms, such as Flickr and Instagram. Instead, they envisioned that Scoopshot offers a unique opportunity for media organizations to utilize the crowd as a constant source of fresh content, and for the crowd to be compensated for their efforts. In an interview, the COO sums up the rationale of Scoopshot as: *"we are not doing social media; we are helping media to become social"*.

The data repository is composed of both primary data and secondary data. Additionally, to enhance my understanding of the user experience, I have been a registered user on the service since 2011, have participated in a number of the announced photography tasks, and have been following the service development from a user viewpoint ever since. The secondary data included press reviews and online materials concerning Scoopshot. As for the primary data, it consisted of semi-structured face-to-face and computer-mediated interviews. The primary data corpus relies on interviews conducted with twenty informants: two Scoopshot top management members, and eighteen Scoopshot users (Scoopshooters). The 18 Scoopshooters included 15 males and 3 females, of ages ranging between 17 and 46 years, and with different educational and professional backgrounds. The first round of interviews took place between April 2012 and May 2013, and the second interview round was conducted between May 2014 and December 2014. Of the eighteen Scoopshooters, ten participated in both interview rounds; while five participated in the first interview round only and three in the second interview round only. A detailed account of interviewees' demographics and interviewing rounds is provided in Appendix 1.

Considering the dispersed geographic locations of the Scoopshooters, a computer-mediated communication (CMC) strategy was chosen for the interviews. While the main interview core themes remained the same for all interviews, the exact wording and order of some questions differed from one interview to another, depending on the flow of the conversation. Myers and Newman (2007) argue that qualitative interviews are best described as a drama where actors (i.e., the interviewer and the interviewee) perform on a

stage (i.e., study context) using a script (e.g., interview protocol). Such script should have minimal elements (e.g., opening, key questions and closing), but "the qualitative interviewer should always use an incomplete script" to facilitate "openness, flexibility and improvisation" (ibid., p. 14). Exemplary interview protocols for articles III and IV are provided in Appendices 2 and 3 respectively.

The data analysis techniques utilized may be categorized under the umbrella term of thematic analysis. Thematic analysis is commonly described as an analysis technique that involves the cyclic iteration between six phases: (1) familiarizing oneself with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) refining themes and overall story; and finally (6) producing the report (Braun & Clarke 2006). The general aim of thematic analysis is to systematically identify, analyze and report patterns (i.e., themes) in a corpus of data (Fereday & Muir-Cochrane 2006; Braun & Clarke 2006). As such, careful reading and re-reading of the data was followed by initial coding which involves assigning codes (or labels) to quotes considered relevant to the study context. A line-by-line coding process was performed where both theory-driven codes as well as data-driven codes were used. Following the initial coding – and some cases in parallel to it – the codes were collated to generate the key themes and relationships among them. Finally, core themes explaining the research phenomenon were identified, and trivial themes were eliminated from the final analysis. The importance of this procedure (i.e., selective coding) stems from its role in allowing the researcher to saturate the selected themes, while avoiding the inclusion of diverse additional material that has no relevance to the core investigation (Holton 2007). The end-result of this iterative analysis process is a set of key findings which will be presented and discussed in the following chapters.

3 Results

The purpose of this chapter is to present the key findings and results of the dissertation. Section 3.1 gives a holistic insight into the dissertation's key findings, and section 3.2 is dedicated to presenting the key findings of each article individually.

3.1 Summary of findings

Overall, the key findings of this dissertation highlight the complexity and multifaceted nature of crowdsourcing. Crowdsourcing is at the heart of the interplay between actors of varying visions, objectives and motives: between *organizations* seeking survival and co-evolution with their environments, *individuals* seeking the fulfilment of their basic and economic needs, and *technological artifacts* featuring certain logics, designs and capabilities. A successful crowdsourcing endeavor starts with the careful understanding and alignment of the different objectives of those involved.

Firstly, from an organization standpoint, it is important to understand that organizational long term survival is very much dependent on keeping a balance between exploiting existing capabilities and resources on the one hand, and exploring uncharted horizons and introducing new combinations on the other. The dissertation argues that organizations in turbulent, rapidly changing environments need to operate at the edge of chaos, and that a careful crowdsourcing strategy can offer an organization a pathway into novelty without falling into complete mayhem and disintegration. However, it is of utmost importance to recognize the limits of what crowdsourcing can promise, and what to expect from the crowd. Crowdsourcing should not be taken as a substitute to organizations' human capital; rather a supplement. At best, crowdsourcing is an extension to the organizational problem solving capabilities, and as such, it requires a cautious reconciliation of the tension that will arise between internal and external sources of knowledge.

Secondly, from a technical standpoint, it is important to have a clear understanding of the objective(s) of the technology being developed for crowdsourcing purposes. The findings highlight that most crowdsourcing platforms – especially those seeking the crowd's creative contributions – are mixed information systems. This IS class is neither purely utilitarian IS (e.g., an organizational ERP accounting module) nor purely hedonic IS (e.g., a videogame played at home), but is rather a blend of both worlds. Thus, basic design principles of such systems should take into consideration that the time spent on crowdsourcing platforms, while solving specific problems for the organizer, needs to be rewarding and enjoyable.

Thirdly, and probably most critically, the findings emphasize that participating in crowdsourcing platforms is, first and foremost, a volitional and non-punitive behavior, which underlines an important fact: Any crowdsourcing effort is only as effective as the seeker's ability to attract the right crowd to the platform, and motivate their repetitive contributions. Failing to distinguish between the different motivations that drive members of the crowd to participate in crowdsourcing, and how these motivations change over time, will most likely translate into dissatisfaction and discontinuance.

3.2 Findings of individual articles

3.2.1 Paper I: Providing a theoretical foundation for crowdsourcing as a strategy for organizational adaptation

> Poutanen, P., Soliman, W. and Ståhle, P. (Forthcoming). "The complexity of innovation: An assessment and review of the complexity perspective". *European Journal of Innovation Management*.

This article builds on a fundamental assumption: The vast majority of organizations die young (O'Reilly et al. 2009; Stubbart & Knight 2006), and the ability to innovate is a key requirement for their evolution and survival (March 1991). This article is classified as a systematic literature review paper. The article explores the potentials and possibilities of complexity theory and identifies possible points of relevance to the study of (open) innovation. The

explicit research question is stated as follows: *How has complexity theory been applied to explain the dynamic and networked characteristics of an innovation process, and what added value does it bring from an open innovation perspective?*

This article provides an overview of the mainstream innovation management literature, and tracks the historical development of the term 'open' innovation and contrasts it with the 'closed' innovation paradigm. 'Open' innovation here, broadly, means that valuable knowledge (e.g., ideas) can come from both inside and outside the organization, and can take both internal and external paths to market (Chesbrough 2003); whereas 'closed' innovation implies that an organization relies solely on the innovative capacity of its own employees. After analyzing the extracted literature, the article identifies the key features of complexity theory that have been adopted in the (open) innovation studies, and discusses them at three levels of analysis: macro-, micro-, and management levels.

At the macro-level, complexity research portrays innovation as the product of a temporally complex process, and as a requirement for organizations to (co)evolve with the changing environment in which they exist. The two dominant concepts in the literature focusing on this level of analysis are 'temporal complexity' and 'co-evolution'. First, *temporal complexity* suggests that complex systems can be stable for a long period of time, but it is nonetheless possible that in the long run there will be unanticipated, qualitative changes. Temporal complexity emerges as a result of 'time delays', 'lags' and 'differences in rhythms' suggesting that "what had been considered trivial at a given time may become a solution to an unanticipated problem that may arise in the future" (Garud et al., 2011, p. 739) and vice versa. This concept is well-illustrated by a study investigating 3M's innovation practices and processes. The study reveals that one of 3M's key success enablers is the realization that what appears to be false starts or dead-ends in real time, may serve as the foundation for successful innovations at a later point in time (ibid). Second, *co-evolution* accentuates the adaptive behavior of complex adaptive systems; the changes that occur in a CAS in order to co-exist in harmony with its environment. The term co-evolution highlights the reciprocal nature of change and adaptation between the CAS and its environment. Eidelson (1997) notes that a complex adaptive system changes and adapts "either through alteration of its rules, connections, and responses or through

modification of the external environment" (p. 43), which itself, in turn, is composed of a web of complex adaptive systems. This concept is repeatedly illustrated in the (open) innovation literature in terms of open models of innovation describing collaborators evolving in conjunction with one another in order to fit into a larger environmental system (e.g., Basole, 2009; Sawhney & Prandelli, 2000).

At the micro-level, complexity research portrays innovation as an emergent and self-organization process, with a focus on relationship formation, interactions, and knowledge creation among heterogeneous actors. Two related concepts dominate the discussion on the micro level of analysis: self-organization and emergence. First, *self-organization* serves as a concept that can be used to describe how actors within a complex system act cooperatively, seeking solutions for their specific problems by relying on local sources of knowledge, and at the same time benefitting from the whole network of actors with which they interact. Chaos and disorder put complex systems under constant threat of collapse, but instead of collapsing, they destroy old structures and self-organize into new ones (Ståhle 2008). At the heart of this discussion is Schumpeter's evolutionary economics which argues that "the entrepreneurial desire to discover new and profitable organisational combinations provides ... a self-organisational impetus within the economic system" (Foster, 2000, p. 319). Tapsell and Woods's (2010) work on social entrepreneurship illustrates how innovation can be seen as a self-organizing process emerging as a result of different forms of cooperating groups in which interactions between the involved actors give rise to both chaotic and stable outcomes. Closely related to the concept of self-organization is that of emergence. *Emergence* highlights the 'relational complexity' (Garud et al. 2011) of the innovation process and its outcomes. It points to the notion that the output that emerges from an innovation process is qualitatively different from its constituent parts (i.e., cannot simply be understood by analyzing the individual components) (Desai 2010). The concept of emergence is clarified by making a distinction between complex systems and complicated systems. This distinction is well-illustrated by Cilliers' (2000) examples of a jumbo jet and mayonnaise. While a complicated system (e.g., jumbo jet) may be accurately modelled and understood by studying its parts; a complex one (e.g., mayonnaise) may not.

At the management level, complexity suggests institutionalizing governing structures that conceptualize innovation as a paradoxical tension (Jarvenpaa & Wernick 2011) aiming to a balance between chaos and order (Carlisle & Mcmillan 2006), exploration and exploitation (March 1991), or simply between business-as-usual and serendipity (Garud et al. 2011). Organizations embracing this management philosophy are referred to as ambidextrous organizations (Tushman & O'Reilly 1996) operating as a complex adaptive system (CAS). These complex adaptive systems are in constant pursuit of adapting to the environmental circumstances in which they find themselves. The message for organizations here is not to take too rigid a stance in approaches to innovation, but to respond flexibly as internal and external environments demand (Carlisle & Mcmillan, 2006). One of the article's concluding remarks is that in turbulent, rapidly changing environments, organizations need to open up their boundaries to external sources of knowledge and innovation, and crowdsourcing provides one such avenue. Several large organizations have been exploring the potential of such novel domain. Examples include *SAP* (Leimeister et al. 2009), *Dell* (Di Gangi et al. 2010) and the Finnish airline *Finnair* (Jarvenpaa & Tuunainen 2013).

3.2.2   Paper II: Crowdsourcing as a sourcing strategy

> *Soliman, W. (2013). "Crowdsourcing as a sourcing strategy for the ambidextrous organization". Proceedings of the International Society of Professional Innovation Management (ISPIM) Conference - Innovating in Global Markets: Challenges for Sustainable Growth, held in Helsinki, Finland on 16 to 19 June 2013. ISBN 978-952-265-421-2.*

Building on the foundation laid out in Article I, this paper is theoretically-oriented and introduces crowdsourcing as a sourcing approach for ambidextrous organizations. This article contributes to the crowdsourcing literature with two main research questions in mind: *"To what extent does the crowd represent a threat to professionals? And to what extent could organizations utilize this threat as a source of opportunity?"*

The article provides a critical examination of the formalized questions and concentrates chiefly on the media/journalism industry as an organizational field[2], and introduces concrete real life examples of crowdsourcing solutions in this domain. The article's main argument is that crowdsourcing should not be perceived as a replacement to the traditional sourcing channels. Rather, the potential competitive advantage of crowdsourcing stems from being treated as a supplement (i.e., an extension) to the organization's sourcing strategy. The research highlights the fact that unorganized crowd efforts are inherently unreliable, unpredictable and chaotic. However, modern technology provides professionals the tools with which crowd contributions and efforts can be assessed, organized and orchestrated.

The article builds its argumentation on two parallel organizational research streams with several commonalities: complex adaptive systems (CAS) and organizational ambidexterity (Tushman & O'Reilly 1996; Burnes 2005; Carlisle & Mcmillan 2006; Raisch et al. 2009; March 1991). These two research streams point out that organizational survival is contingent upon keeping a balance between exploitation of old certainties and exploration of new possibilities, and that self-destruction can be a result of an imbalance between these two activities. Whereas the term ambidexterity was originally coined to describe an organization's ability to balance between exploitation and exploration activities; recent development has extended the term to describe a firm's ability to simultaneously balance any activities that are in a trade-off situation (Rothaermel & Alexandre, 2009, p.759). In the same vein, ambidexterity from a CAS viewpoint reflects an organization's ability to strike a balance between keeping its heritage and seeking new opportunities (Tapsell & Woods 2010); between the known and the unknown; or simply between order and chaos (Burnes 2005). Furthermore, both research streams share the view that ambidexterity manifests itself at different levels of the organization. Whereas organizational ambidexterity is argued to be observed on all organizational levels, all the way down to the individual level (Raisch et al. 2009, p.688); complexity theory views organizations as complex adaptive systems nested in larger CAS, and composed of smaller CAS (Pellissier 2012, p.33). For instance, Carlisle and McMillan (2006) discuss the operation between stability and chaos at the level of the accounting and marketing

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[2] DiMaggio and Powell (1983) define an organizational field as "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (p. 148).

departments; while Rothaemel and Alexandre (2009) illustrate how ambidexterity can be achieved at the sourcing strategy level.

The article then identifies three types of crowdsourcing strategies that ambidextrous organizations in the media/journalism industry would be likely to adopt: a) as *quality assurance* of professional journalists' input; b) as a relatively inexpensive supply of the relatively expensive *known input*; and c) as a relatively inexpensive supply of the *unknown input*. First, an ambidextrous organization could utilize crowdsourcing as a verification tool to the professional news supply. Professor Alfred Hermida, a founding member of 'BBCnews.com', points out that real-time, networked technologies have unbundled the news verification process. For instance, popular social networks, like Twitter (www.twitter.com), may be utilized to allow members of the public to be involved – alongside editors and journalists – to fact check contradictory reports and rumors (Silverman 2012). Second, an ambidextrous organization could utilize crowdsourcing as a supplier of known, expensive-to-cover events. For instance, the crowdsourcing mobile application and platform Scoopshot (www.scoopshot.com) allows news agencies to send specific photography tasks to the crowd of known events, usually in return of a relatively small financial reward. For example, through the Scoopshot platform, a US-based media firm may crowdsource the coverage of a popular event happening in Japan. To control the quality of submitted content, only registered users may participate in this platform. Additionally, the mobile application automatically collects time and location stamps of each taken photo, and allows news agencies to connect with the source for further investigation if/when needed. Third, an ambidextrous organization could utilize crowdsourcing as a supplier of unknown (or as-they-happen) events. For instance, the social-media-like platform CNN's iReport (www.ireport.cnn.com) allows its registered members to submit and publish content on the site. Professionals from CNN can then go through all the submitted content and select reports that are suitable (e.g., confirmed breaking news) for airing on the multiple CNN platforms.

Finally, The article illustrates that by grounding crowdsourcing in the resource advantage theory (Hunt & Morgan 1995; Hunt & Davis 2008), media organizations can redefine their perception of their audience, from the traditional view as passive consumer of content, to a more active view as a valuable resource of co-producers. Within this theoretical framing, achieving

sustained competitive advantage is possible; though not guaranteed. Crowdsourcing success is contingent upon an *array of complex factors*, the most important of which are the ability to motivate the crowd; the ability to elicit the right contribution; and the ability to retain and nurture this crowd. Therefore, no crowdsourcing initiative can be perfectly imitated; the tacit experiences gained from each initiative remain within the firm. Only then can crowdsourcing be a potential source of competitive advantage.

3.2.3 Paper III: Factors leading to continued use of crowdsourcing systems.

> Soliman W. and Tuunainen V.K. (2015). "Understanding continued use of crowdsourcing systems: An interpretive study". *Journal of Theoretical and Applied Electronic Commerce Research*, 2015, vol. 10, pp. 1–18. DOI: 10.4067/S0718-18762015000100002.

Picking up from Article II's concluding remarks on the criticality of understanding the "array of complex factors" responsible for motivating the crowd, Article III is set out to investigate exactly that: *"to investigate the motivations that drive the initial use of a crowdsourcing system, and find out whether these motivations remain the same from initial to continued use".*

The article points out that existing crowdsourcing research investigating solvers' motivations to participate in various crowdsourcing initiatives provides us with consistent evidence that both intrinsic and extrinsic motivations are important in influencing the use of and participation in crowdsourcing systems, as illustrated in Table 2. While these studies add to our understanding of solvers' motivation, they largely ignore the dynamic nature of the relationship between the motivational factors and the system use behavior. This is mainly due to the fact that these studies: a) adopt unitary dimension of motivations, by observing the motivation origin only (i.e., intrinsic vs. extrinsic), and b) adopt a static view of the system's use motivations, by making no distinction between initial use and continued use.

Table 2 Reported motivations for participating in crowdsourcing initiatives - Source: (Soliman & Tuunainen 2015a)

Empirical Context	Findings	
	Intrinsic Motivations	Extrinsic Motivations
iStockPhoto (Brabham 2008)	• Creativity and fun.	• Desire to make money. • Develop individual skills.
SAP Idea Competition (Ebner et al. 2009)	• Creative challenge of the contest.	• SAP training offerings. • Monetary incentives.
SAP Idea Competition (Leimeister et al. 2009)	*(The authors acknowledge the importance of intrinsic motivations; however, they explicitly exclude them from the focus of the study.)*	• Learning and gaining knowledge. • Direct compensation. • Self-marketing. • Acknowledgement from others.
1. CrowdSpirit 2. FellowForce 3. Owela (Antikainen et al. 2010)	• Entertainment. • Collective creativity.	• Monetary reward. • Learning new ideas.
Threadless (Brabham 2010)	• Love and addiction towards the Threadless community.	• The opportunity to make money. • The opportunity to improve skills. • The opportunity to find work.
Taskcn (Zheng et al. 2011)	• Enjoyment of participating in the contest.	• To gain publicity. *(Money was not significant.)*
Sanoma Newspaper (Väätäjä 2012)	• Fun. • Sharing news.	• The opportunity to get monetary reward.

Considering these limitations, this article utilizes a dynamic view of the motivational factors framework (Nov et al. 2010). The motivational factors framework provides a two-dimensional classification of the various motivations depending on their origin and aim (see Figure 4). Based on their *origin*, motivations are classified as extrinsic (i.e., external) and intrinsic (i.e.,

internal) motivations. Extrinsic motivation describes doing something in order to attain some separable outcome, while intrinsic motivation is defined as the doing of an activity for its inherent satisfaction rather than some separable consequence (Ryan & Deci 2000a; Deci et al. 1999; Ryan & Deci 2000b). Based on their *aim*, human motivations are classified as selfish (i.e., aimed at the self) and social (i.e., aimed at others) (Nov et al. 2010). Behavior with a selfish aim means that the action is intended to serve one's self, while behavior with a social aim means that the action is directed at, or intended to serve others. The dynamic nature of motivations emphasize that their strengths vary over time. The same mix of motivations does not necessarily lead to the same behaviors in different circumstances, at different points of time, and while different motivations may co-exist over time, their respective strengths can lead to varying behaviors (Reeve 2008).

		ORIGIN	
		INTRINSIC	**EXTRINSIC**
AIM	**SELFISH**	**Initial Use** Curiosity	Monetary rewards
		Continued Use Enjoyment	Non-monetary rewards
	SOCIAL	Altruism	Publicity

Figure 4 Motivational factors and the temporal dimension – Source (Soliman & Tuunainen 2015a)

Consistent with previous research, the findings suggest that the main drivers to use the studied crowdsourcing platform, Scoopshot, were a mix of both extrinsic and intrinsic motivational factors. Intrinsically, members of the crowd were driven by curiosity, enjoyment, and altruism; while the main extrinsic drivers were monetary reward, developing one's skill and career, and publicity. However, while both intrinsic and extrinsic motivational factors were present in both initial and continued use, the interplay between selfish (i.e., aimed at the self) and social (i.e., aimed at others) motivational factors

provides an additional layer of explanation. The findings indicate that initial use is dominated by selfish motivational factors (namely, financial reward and curiosity), while continued use is driven by both selfish and social motivational factors. In continued use, neither financial reward nor curiosity played such a significant role anymore.

3.2.4 Paper IV: Factors leading to use discontinuance of crowdsourcing systems.

> Soliman W. and Tuunainen V.K. (Unpublished). Understanding discontinued use: Interpretive study of a volitional mixed system.

Article IV may be considered a continuation to article III; a second phase of a longitudinal research project with the general aim of understanding IS use lifecycle. This article points to a gap in the IS literature regarding how, when and why use discontinuance happens in information systems in general, and crowdsourcing systems in particular. As such, this research is set out with these two objectives in mind: *"First, to uncover what discontinuance means and how it unfolds in the context of crowdsourcing as an instance of volitional mixed systems. Second, it aims to produce a conceptual model that explains use-discontinuance"*.

It is well-established in the IS literature that IT artifacts, based on their intended purpose or "functional capacity" (Wu & Lu 2013), may be categorized into three classes of IS: utilitarian, hedonic, and mixed (or dual/multi-purposed) systems (Wu & Lu 2013; Gerow et al. 2013; Soliman & Tuunainen 2015a). The use of utilitarian systems (e.g. enterprise-class systems) is argued to be mainly driven by extrinsic motivational factors, for instance, perceived usefulness in terms of improving job performance (Davis 1989; Karahanna et al. 1999). The use of hedonic systems (e.g. video games) is argued in turn to be mainly driven by intrinsic motivational factors, like perceived enjoyment of spending time online or playing a game (van der Heijden 2004; Lin & Bhattacherjee 2010). The use of mixed systems (i.e. applications that are both useful and entertaining) is argued to be driven by a mix of both intrinsic and

extrinsic factors (Chesney 2006; Gu et al. 2010; Agrifoglio et al. 2012; Soliman & Tuunainen 2015a).

Article IV proposes the inclusion of another dimension – to the established IS class dimension – that improves our understanding of the use phenomenon: The use context dimension (e.g., the level of volition vs. mandate) by which a user perceives a particular IS. This framing has two very important implications. First, use behaviors with different IT applications belonging to the same IS class (e.g., utilitarian IS) could potentially have different antecedents and outcomes in different contexts. For example, contexts in which a new enterprise system (e.g. SAP modules) is imposed on employees in work context are not expected to be generalizable to non-work contexts, in which users choose to adopt and use a freely available cloud-based tool (e.g. Dropbox). Second, this also means that use behaviors of the same IT application (e.g., Twitter) could be explained differently depending on the users' cognitive frame or use-contexts. For example, Agrifoglio et al. (2012) found that users who used Twitter for work purposes, were predominantly driven by extrinsic motivational factors, while users who used it for leisure purposes were predominantly driven by intrinsic motivational factors.

Based on the proposed classification, six IS types can be observed, as illustrated in Table 3. The article argues that most crowdsourcing platforms represent an instance of systems that belongs to the Type-6 category. Interestingly, while crowdsourcing as a research topic has become increasingly popular, discontinuance of such volitional mixed systems has been entirely unexamined in previous research. Hence, article IV was set out to investigate use discontinuance and the factors leading to it in the Scoopshot context (i.e., a Type-6 IS).

Table 3 IS classification based on system type and use-context – Adapted from (Soliman & Tuunainen 2015b)

	Context (level of volition)	
	Work context (low volition)	Non-work context (high volition)
Utilitarian IS	**(Type-1) Mandated use of enterprise systems.** Examples include enterprise systems like SAP (www.sap.com).	**(Type-2) Volitionally used utilitarian tools.** Examples include cloud storage tools like Dropbox (www.dropbox.com).
Hedonic IS	**(Type-3) Mandated use of a gamified utilitarian system.** Examples include tools like Microsoft's Ribbon Hero game (www.ribbonhero.com).	**(Type-4) Volitionally used hedonic systems.** Examples include video games played in leisure time like King's Candy Crush Saga (www.king.com).
Mixed IS	**(Type-5) Mandated use of systems that are both hedonic and utilitarian.** Examples include enterprise-oriented social media tools like Yammer (www.yammer.com).	**(Type-6) Volitionally used systems that are both hedonic and utilitarian.** Examples include crowdsourcing systems like Scoopshot (www.scoopshot.com).

The findings reveal that all interviewees who participated in the study had stopped using Scoopshot for varying periods of times (see Figure 5). Close analysis of the data suggests that discontinuance is not a single discrete event, but rather a process that takes shape over time, starting with dormancy (marked in yellow in Figure 5) and ending with quitting (marked in red in Figure 5). From a system-user relationship perspective, the main difference between dormancy and quitting is whether or not users have made the deliberate decision of removing the application from their mobile phones. The removal marks the transition from undetermined dormancy to final quitting.

The findings also show that there was a behavioral distinction between two types of users: hobbyists, who were predominantly motivated by the service's hedonic value and did not attach much significance to the financial reward;

and instrumentalists, who in contrast were mostly driven by the service's utility[3] and did not attach much value to its hedonic aspects. These profiles imply neither positive nor negative connotations; they are merely labels that we find best to describe the users' perceptions of the system, and the dominant expectations these perceptions entail. This classification – informed by the framing theory (Lindenberg 2001) – is determined by identifying the key factors motivating the participants to use Scoopshot, and the salient factors responsible for their dissatisfaction.
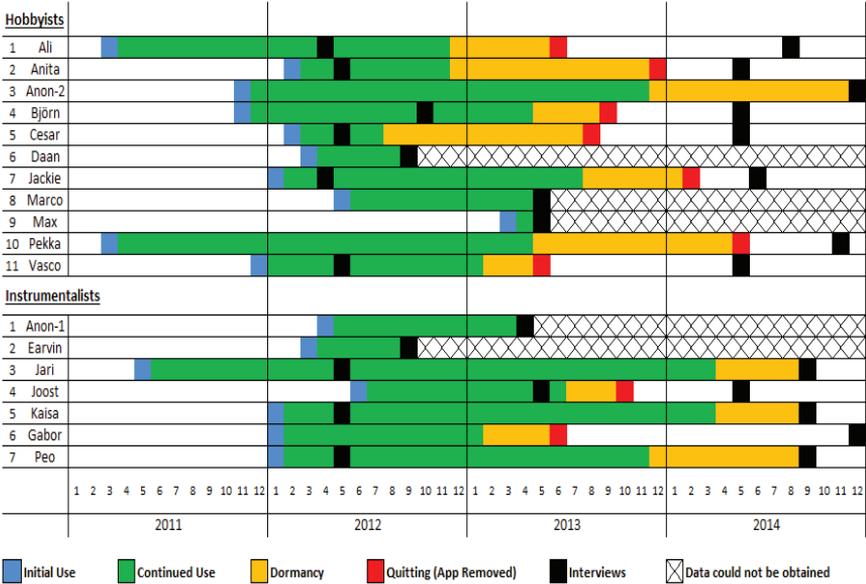
Figure 5 Time map illustrating the use lifecycle of users in different groups

Most importantly, the findings highlight that the source of dissatisfaction differed for hobbyist and instrumentalist users. While decreasing perception of usefulness (i.e., disappointing utility) was the dominant source of dissatisfaction for instrumentalists; the unfulfilled basic needs for competence and relatedness were the main sources of dissatisfaction for hobbyist users. Consistent with EDT theory dissatisfaction with Scoopshot was a key antecedent of reaching the first stage of discontinuance: dormancy. However, dissatisfaction is not the sole factor responsible for making the transition from active use to dormancy. The data provides strong evidence that the availability

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[3] Note that the term utility is used here more generically, as opposed to its strict use in economic theory as a measure of consumers' preferences. As such, following the Merriam-Webster dictionary, utility is treated as "the quality or state of being useful", or the extent to which a user perceives an IS to be useful and instrumental (Venkatesh et al. 2003; Gerow et al. 2013; Wu & Lu 2013).

of (seemingly better) alternative offerings in a user's environment appears to be an important condition that needs to be satisfied before users do make the transition to the quitting phase. In other words, attention to alternatives has a significant role in amplifying or mitigating the impact of dissatisfaction on discontinuance. This assertion explains, for example, why some users who are unaware of any available alternatives, keep using a system that they are dissatisfied with – an occurrence that may be called *'dissatisfaction-continuance anomaly'*.

4 Discussion and Conclusions

The point of departure of this dissertation has been the assertion that crowdsourcing is a complex phenomenon which is at the heart of the interplay between actors of varying objectives and motives: between *organizations* seeking survival and co-evolution with their environments, *humans* seeking the fulfillment of their basic and economic needs, and *technological artifacts* featuring certain logics, designs and capabilities. The intricate nature of this socio-techno-economic mesh warrants a multi-disciplinary research orientation with multiple levels of analysis. Taken together, the four articles that make up this dissertation provide a holistic and multi-perspective understanding of crowdsourcing. The thesis as such provides a number of important contributions to both theory and practice. Section 4.1 lists a summary of the overall contributions alongside corresponding article(s) supporting each of them. These contributions – both theoretical and practical – are then discussed elaborately in sections 4.2 and 4.3 respectively. Finally, section 4.4 is dedicated to discussing the limitations of this thesis work and directions for future research.

4.1 Summary of contributions

The following table provides a list of the key theoretical and practical implications of the thesis as a whole.

Table 4 Summary of contributions

Implications	Notes
Theoretical Implications (1) Ambidextrous organizations are more likely than others to devise a sourcing strategy that keeps a balance between its traditional/orderly and nontraditional/chaotic sourcing approaches; crowdsourcing is the farthest point the ambidextrous organization can reach without deteriorating into complete chaos and disintegration.	• This implication is discussed extensively in Articles I and II. • Rooted in complexity theory and studies of organizational ambidexterity. • The argument is theoretically driven.
(2) Crowdsourcing systems, particularly those in the trade of creative tasks, are, by and large, mixed (i.e., dual-purposed) systems that cannot be categorized as hedonic or utilitarian only. Use behavior of such systems may be explained by an amalgam of both extrinsic and intrinsic motivational factors.	• This implication is discussed extensively in Article III. • Rooted in motivation theory and studies of IS adoption and use. • The argument is theoretically driven and empirically grounded.
(3) While crowdsourcing systems' initial use seems to be predominantly driven by selfish motivational factors, continued use requires the interplay of both selfish (aimed at the self) and social (aimed at others) motivational factors.	• This implication is discussed extensively in Article III. • Rooted in motivation theory and studies of IS adoption and use. • The argument is theoretically driven and empirically grounded.
(4) Users of crowdsourcing systems, particularly those in the trade of creative tasks, may be classified into two distinct groups: Instrumentalists whose primary motivation is driven by the system's utilitarian value; and hobbyists whose primary motivation is driven by the system's hedonic value.	• This implication is discussed extensively in Article IV. • Rooted in motivation and cognitive framing theories. • The argument is theoretically driven and empirically grounded.

Implications	Notes
(5) After extended periods of crowdsourcing systems usage, particularly those in the trade of creative tasks, discontinuance may be seen as a process that takes shape over time, which can be explained by a) dissatisfaction with the crowdsourcing system, and b) availability of, and attention to, alternatives.	• This implication is discussed extensively in Article IV. • Rooted in motivation and expectation disconfirmation theories. • The argument is theoretically driven and empirically grounded.
<u>Practical implications</u> (1) Crowdsourcing is undoubtedly chaotic and unpredictable, therefore, it is best thought of as a strategy that increases the chances of organizational survival; not as one that guarantees it.	• This implication is discussed extensively in Articles I and II. • Rooted in complexity theory and studies of organizational ambidexterity. • The argument is theoretically driven.
(2) While crowdsourcing success is not guaranteed; not understanding what motivates the crowd to participate in a crowdsourcing initiative will most likely lead to failure.	• This implication is discussed extensively in Article II. • Rooted in complexity theory and studies of organizational ambidexterity. • The argument is theoretically driven.
(3) Crowdsourcing continued use (i.e., sustained participation) may be boosted by: a) adopting an appropriate and transparent communication strategy; b) facilitating social networking capabilities; c) supporting a mechanism for feedback; and d) implementing a strategy that increases switching costs.	• This implication is discussed extensively in Articles III and IV. • Rooted in motivation and expectation disconfirmation theories. • The argument is theoretically driven and empirically grounded.

4.2 Theoretical contributions

This thesis offers a number of theoretical insights that are relevant to scholars interested in studying organizational behavior and IS adoption and use. These insights are discussed in the following sections.

(1) Ambidextrous organizations are more likely than others to devise a sourcing strategy that keeps a balance between its traditional/orderly and nontraditional/chaotic sourcing approaches; crowdsourcing is the farthest point the ambidextrous organization can reach without deteriorating into complete chaos and disintegration.

One of the main assumptions underlying this thesis – rooted in complexity theory and organizational ambidexterity (Tushman & O'Reilly 1996; Burnes 2005; Carlisle & Mcmillan 2006; Raisch et al. 2009; March 1991) – is that organizations resemble in their behavior living organisms aiming for survival through adaptation to their environment (Poutanen et al. Forthcoming). Mainstream organization behavior research asserts for a positive link between organizational survival and organizational ambidexterity (see, Raisch et al., 2009). As illustrated earlier, ambidexterity reflects an organization's ability to strike a balance between exploiting its existing capabilities and exploring new horizons (March 1991); between keeping its heritage and seeking new opportunities (Tapsell & Woods 2010); between the known and the unknown (Cheng & Van de Ven 1996); or simply between order and chaos (Burnes 2005). Influenced by this understanding, I proposed conceptualizing crowdsourcing as a sourcing strategy, by which the organization broadens its procurement channels through the careful integration of the crowd as a supplier (Soliman 2013). While the term *procurement* here is used broadly to encompass any kind of resource residing beyond the boundary of the organization (e.g., crowd's knowledge, expertise, creativity, funding, belongings, etc.); the emphasis that I would like to highlight is on the *complementarity* nature of crowdsourcing to the organizational existing resources. A crowdsourcing strategy works best when *integrating* the crowd's contributions with the organizational existing resource base. In other words, crowdsourcing should not be mistaken for an absolute substitute of organizational existing resources.

Complexity theory provides a rationale (i.e., theoretical explanation) for such assertion. To adapt, a complex adaptive system (CAS) tends to operate at the

edge of chaos because if it is too stable, nothing changes and it risks ossification; and if it is too chaotic, it is overwhelmed with change and risks disintegration. Carlisle & Mcmillan (2006) point out that although the survival of a CAS is not certain; it will try to increase its surviving chances by trying to operate at the edge of chaos. It is important, however, to be sensitive to the distinction between operating on the edge of chaos (i.e., zone of emergent complexity) and operating under complete chaos (i.e., randomness). Embracing chaos of the unknown does not equate with complete loss of control. Such interpretation is congruent with the paradox management perspective (see, Jarvenpaa & Wernick, 2011) which, instead of suppressing one side of two seemingly opposing poles (e.g., *either* order *or* chaos), advocates tapping the positive potential of both sides (e.g., **both** order **and** chaos).

(2) Crowdsourcing systems, particularly those in the trade of creative tasks, are, by and large, mixed (dual-purposed) systems that cannot be categorized as hedonic or utilitarian only. Use behavior of such systems may be explained by an amalgam of both extrinsic and intrinsic motivational factors.

As pointed out earlier, the IS field has classified IT artifacts, based on their intended purpose, into three categories: utilitarian, hedonic, and mixed systems. Crowdsourcing systems, particularly those in the trade of creative tasks (e.g., ideation, problem solving, coding, art design, music, photography, etc.) belong to this class of IS. Such crowdsourcing systems are mixed due to the fact that they reflect a utilitarian relationship between an organization and its community with the aim of carrying out specific tasks, while user participation is still highly volitional, self-determined and hedonistic values are very likely to be strong influencers.

In the empirical setting of Scoopshot, I found that both intrinsic and extrinsic motivations factors have had a strong impact on the crowdsourcing system's use. The salient extrinsic motivational factors were the opportunity to gain financial (i.e., money) and non-financial rewards (e.g., skill development and future employment), and the opportunity of publicity (i.e., being noticed and recognized). The salient intrinsic motivational factors, on the other hand, were curiosity, enjoyment, and altruism (i.e., inherent desire to help others). While these identified motivational factors together give a holistic picture of the motivational factors driving the crowdsourcing system's use from a static point

of view (i.e., cross-sectional analysis); adding the temporal dimension to the analysis allows us to distinguish between two widely acknowledged IS use phenomena: *IS initial use* (aka, adoption), and *IS continued use* (aka, post adoption). This theoretical insight is discussed next.

(3) While crowdsourcing systems' initial use seems to be predominantly driven by selfish motivational factors, continued use seems to require the interplay of both selfish (aimed at the self) and social (aimed at others) motivational factors.

Various IS use studies (Joyce & Kraut 2006; Karahanna et al. 1999; Ortiz de Guinea & Markus 2009; Park & Snell 2011) have shown that the antecedents (e.g., motivational factors, activities, decisions, or behaviors) leading to the initial use of an IS are different from those leading to the subsequent and continued use (i.e., IS continuance) of that system (Bhattacherjee 2001; Karahanna et al. 1999), and that the antecedents associated with initial usage may fail to explain subsequent usage (Agrifoglio et al. 2012; Sun et al. 2012). Also, motivation theory highlights the dynamic nature of motivations (Reeve 2008). The same mix of motivations does not necessarily lead to the same behaviors in different circumstances, at different points of time. While different motivations may co-exist over time, their respective strengths can lead to varying behaviors. For instance, a certain behavior (e.g., IS continuance) is likely to be observed when the mix of motives inducing such behavior is strong. This also means that if and when these motives grow weaker; it is likely that the behavior will no longer take place (e.g., IS continuance turns into IS discontinuance).

Consistent with this understanding, the findings suggest that the motivational factors responsible for the crowdsourcing system's initial use are qualitatively different from the motivational factors leading to continued use. Above all, I found that while *selfish motivational factors* (e.g., curiosity and the financial reward) played a dominant role in attracting the solvers in making their initial use decision; *social motivational factors* (e.g., altruism and publicity) distinctly grew in importance during the subsequent use stage. To the best of my knowledge, this is the first research to highlight the changes that occur in the nature of the motivations from initial to continuous use in the context of mixed (crowdsourcing) systems.

(4) Users of crowdsourcing systems, particularly those in the trade of creative tasks, may be classified into two distinct groups: Instrumentalists, whose primary motivation is driven by the system's utilitarian value; and hobbyists, whose primary motivation is driven by the system's hedonic value.

While collectively, contributions of the crowd solvers are seen to be driven by a mix of both intrinsic and extrinsic (and selfish and social) motivational factors; participants may be classified into two distinct groups: instrumentalists and hobbyists. This classification is rooted in the theorized link between goals and behavior via selective cognitive processes. According to Lindenberg (2001), in any situation a multitude of (conflicting and/or compatible) goals are competing over our limited cognitive resources (e.g., attention and memory). The goal that manages to overshadow the other goals strongly influences our cognitive frame according to which we make sense of situations around us (see also, research on cognitive categorization theory, e.g., Dutton & Jackson, 1987; Webster & Martocchio, 1993). For example, in performing a creative task, if the goal of "making money" overshadows the goal of "having fun"; a cognitive frame is created in which the mobilized heuristics and attitudes are specific to achieving the "money making" goal. It is also argued that the goals that do not win (e.g., having fun) are not discarded altogether. Rather, they are still active in the background and, depending on their strength and compatibility with the winning goal, they are said to either "weaken or strengthen the grip the frame has on the scarce cognitive resources" (Lindenberg, 2001, p. 322).

This discussion suggests that the classification proposed here only reflects which factors are on the foreground and which are in the background, and that the observed behavior results from the interplay between the various motivational factors. Therefore, while the two proposed profiles (i.e., hobbyists and instrumentalists) may reflect a dominating cognitive frame for appropriating the crowdsourcing system, it does not mean that either profile is driven by a pure set of motivational factors. But most importantly, these two profiles imply neither positive nor negative connotations; they are merely labels that best describe the solvers perception of the crowdsourcing system, and the dominant expectations these perceptions entail.

(5) After extended periods of use of crowdsourcing systems, particularly those in the trade of creative tasks, discontinuance may be seen as a process that takes shape over time, which can be explained by a) dissatisfaction with

the crowdsourcing system, and b) availability of, and attention to, alternatives.

The evidence from the longitudinal research suggests that (use) discontinuance is a process that takes shape over time, where a period of dormancy precedes the eventual decision to permanently end the use-lifecycle. The distinction between dormancy and quitting parallels to some extent what earlier research identified as stalling and rejection (Pollard 2003). The terms stalling and rejecting are more suitable to contexts that involve a form of imposition (e.g., in organizational context) where users might show signs of resistance to organizational change projects. In volitional contexts, however, users presumably have complete autonomy over their choices and decisions; thus, dormancy and quitting better describe these behaviors.

Consistent with expectation disconfirmation theory (EDT), the findings strongly point out that dissatisfaction is a key antecedent of reaching the first stage of discontinuance: dormancy. The findings also indicate that sources of dissatisfaction for instrumentalists and hobbyists are different. To instrumentalists, dissatisfaction was predominantly attributed to disappointing utility, as suggested by EDT (Bhattacherjee 2001; Lee 2010). This finding is also in general accord with IS discontinuance within organizational setting (e.g. Furneaux & Wade, 2011). The important issue to highlight here, however, is that the definition of utility (e.g., perceived usefulness) varies immensely from one user to another. While it may be interpreted in terms of financial gains to some users, others may interpret it differently, discarding the importance of money altogether and focusing on non-financial gains, like seeking publicity. The definition of utility is essentially a matter of what a user intends to utilize the system for.

To hobbyists on the other hand, dissatisfaction was attributed to the crowdsourcing system's failure to satisfy their hedonistic aspirations (e.g., feedback and social networking). IS research highlights the importance of such values on users' productivity in volitional use contexts, like content contribution on YouTube (Huberman et al. 2009), participation in news communities (Joyce & Kraut 2006) and involvement in (unpaid) OSS development projects (Shah 2006). Motivation research provides a remarkable explanation regarding the role of feedback and social relatedness on human behavior (e.g., Deci et al. 1999; Deci & Ryan 2000). It is widely recognized that

intrinsically motivated behaviors require the fulfillment of the three psychological needs for autonomy, competence and relatedness. While joining and participating in most crowdsourcing systems is an entirely volitional behavior with no punitive repercussions (thus fulfilling the users' need for autonomy); for the period this research was conducted, the studied crowdsourcing system did not have features in place to satisfy users' needs for competence (e.g., voting, commenting) and relatedness (e.g., sharing and connecting with peers). Interestingly, the research findings suggest that hobbyists viewed these features as more valuable than the financial incentives. Actually, earning money did not prevent dissatisfied hobbyists from quitting the crowdsourcing system; and in some cases, the user made the quitting decision even without reimbursing his earned money.

Dissatisfaction, however, is not the sole factor responsible for making the transition from active use to dormancy. The availability of (seemingly better) alternative offerings in a user's environment appears to be an important condition that needs to be met before users do make the transition to the quitting phase. In other words, attention to alternatives can be seen as having a significant and moderating effect on the impact of dissatisfaction on discontinuance. This assertion explains, for example, why some users who are unaware of any available alternatives, keep using a system that they are dissatisfied with. Note that the "attention to alternatives" concept has a cognitive component (e.g., knowing about an alternative) as well as conative/behavioral component (e.g., trying an alternative) (see, Kim & Son 2009). In practical terms, attentiveness to alternatives denotes that a user of a focal system knows about the availability of an alternative and that they have also tried that alternative. It is also important to note that the impact of attention to alternatives on discontinuance is conceptually and temporally different from the impact of disconfirmation on dissatisfaction. Whereas dissatisfaction resulting from disconfirmed expectations is based on a comparison between what a user expects of an IS and what it delivers; attention to alternatives initiates a comparison between the performances of two concurrent alternative systems.

In sum, as illustrated in Figure 6, the underlying process driving IS discontinuance (i.e., transition from dormancy to quitting) seems to be heavily contingent on dissatisfaction (with its respective sources), but also contingent on the users' ability to find an appropriate alternative to the focal system. In

other words, once a satisfactory replacement is found, keeping the focal system or removing it becomes a trivial matter in most cases.
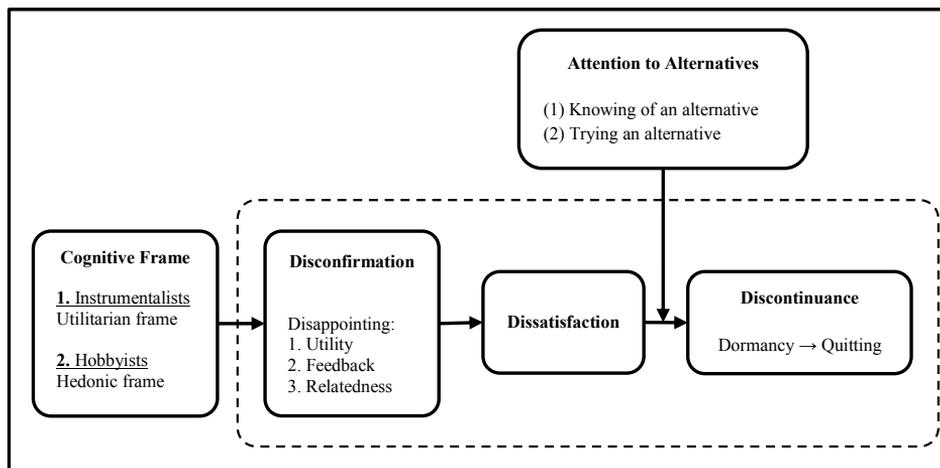
Figure 6 Conceptual model for use discontinuance of volitional mixed systems

4.3 Practical contributions

This thesis offers a number of practical implications to organizations seeking utilizing crowdsourcing as an approach to problem solving.

(1) Crowdsourcing is undoubtedly chaotic and unpredictable, therefore, it is best thought of as a strategy that increases the chances of organizational survival; not as one that guarantees it.

Charles Darwin has been quoted as saying, *"it is not the strongest of the species that survive, nor the most intelligent, but the one that is most responsive to change"* (O'Reilly and Tushman, 2008, p. 186). This is very much true of organizations as well. It has been shown that the vast majority of organizations die young. For instance, only a percentage of less than 0.1% of US firms actually make it to celebrate their 40th anniversary (O'Reilly et al. 2009; Stubbart & Knight 2006). Organizational survival and adaptability is influenced by exposure and response to external events. In practical terms, organizations may expose themselves and respond to external events by opening up their boundaries to external sources of knowledge and innovation. It is only recently that organizations have begun to use unorthodox approaches to knowledge procurement, often described as "chaotic", like crowdsourcing. Crowdsourcing can be thought of as a "distant search" strategy by which an organization broadens its solution landscape (Afuah & Tucci 2012). While

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InnoCentive is probably one of the earliest and highly cited examples of organizations that have incorporated the "unusual suspects" in solving organizational challenges (Lakhani & Jeppesen 2007), many large organizations have followed suit in exploring this novel domain, including SAP (Leimeister et al. 2009), Dell (Di Gangi et al. 2010), Lego (Schlagwein & Bjørn-Andersen 2014), and Finnair (Jarvenpaa & Tuunainen 2013). It is important, however, to note that organizations must not overestimate the promise of crowdsourcing. It is best thought of as a strategy that increases the chances of organizational survival, not as one that guarantees it.

(2) While crowdsourcing success is not guaranteed; not understanding what motivates the crowd to participate in a crowdsourcing initiative will most likely lead to failure.

Despite the many flagship success stories (e.g., the InnoCentive Platform and the Goldcorp Challenge); there are even more (usually untold) stories of failure. These cases have failed for various reasons; it could be because they have failed to engage/motivate the crowd; they have failed to source the relevant/desired contributions; or they have failed to retain/nurture the crowd. For example, Levia, a producer of light-based technology aimed at healing the psoriasis disease, tried to crowdsource its advertising commercial; but flopped mainly due to its failure to generate interest among the crowd (Levia 2010). Also, a firm might succeed in motivating the crowd to generate content; just not the desired type. Chevrolet, in an early experimentation attempt to tap into the crowd as a source of advertising content for its (then) new Tahoe model, the organization was bombarded with a flood of unexpected/undesired ridiculing content (Brabham 2009). Yet, a firm may succeed to engage the crowd, provoke the correct contributions; but subsequently fails in retaining the crowd. The crowdsourcing platform Cambrian House represents such an example. Commenting on the matter, the company's CEO says: "Indeed, our model failed. In short: we became a destination people loved to bookmark more than they loved to actively visit" (Schonfeld 2008). The lessons learnt from these real life stories suggest that crowdsourcing success is contingent upon an array of complex factors, the most important of which are the ability to motivate the crowd; the ability to elicit the right contribution; and the ability to retain and nurture this crowd.

(3) Repetitive participation in crowdsourcing may be boosted by a) adopting an appropriate and transparent communication strategy; b) facilitating social networking capabilities; c) supporting a mechanism for feedback; and d) implementing a strategy that increases switching costs.

Firstly, in terms of the crowdsourcing organizers' communication and marketing strategies, this thesis emphasizes that system usage is induced by a mix of at least four broad classes of motivational factors (see Figure 4), of which the financial compensation plays only a partial role, and particularly for the first time users. While an important incentive, the financial reward alone does not seem to be enough to retain a community of repetitive solvers. Highlighting the utilitarian aspect of such platforms, while ignoring the hedonic value that users expect to experience, would eventually translate to short-term usage span. To motivate users who value more than financial rewards, crowdsourcing organizers need to provide features that facilitate the fulfillment of their basic needs for *autonomy* (i.e., volition), *competence* (e.g., through feedback) and *relatedness* (e.g., through social networking). As such, adopting the same marketing campaign for attracting new users might not be as effective for retaining them. While highlighting the financial reward aspect might seem effective in attracting curious users to try the service, demonstrating also other values that the system could provide (e.g., personal and societal values) may have a profound effect on retaining and building a community of repetitive participants.

Secondly, the possibility to gain publicity or recognition seems to be particularly influential on forming the solvers' decision to continue to use the service. To accommodate this, crowdsourcing organizers of similar services may integrate an additional motivational component to their platforms that would satisfy the users' desire to exhibit (i.e., present or display) their contributions. For instance, the answer to this could be as simple as adding a webpage (i.e., public wall) where crowd contributions may be viewed, shared and discussed among the community members.

Thirdly, feedback seems to have a major impact on solvers' attitude towards participating in the crowdsourcing system. Another motivational component that appeals to this could be an addition to the previously discussed public wall, in which users are allowed to vote (e.g., give the thumbs-up) and

comment on each other's sold or unsold content. This feedback mechanism could satisfy the basic need of competence within the individual solver, and as a result, this could induce a positive attitude towards the service, and eventually reinforce the behavior of continuous participation.

Finally, while crowdsourcing organizers have no direct control over their users' attention to alternatives, they could adopt a strategy that increases switching costs. Switching costs are conceptualized as potential losses that could result from terminating the existing relationship with a system and establishing a new one (Kim & Son, 2009). One such strategy is utilizing a gamification feature (Hamari & Koivisto 2015) like introducing a scoring mechanism (Blohm & Leimeister 2013) with points awarded to all contributions whether sold or not (e.g., points for submitting content, points from peer-evaluation, etc.). Introducing such a scoring system can have dual effect on the users of the service: adding a scoring system could amplify the constraint mechanism (i.e., barrier to discontinuance) by fueling the users' feeling of loss if/when they consider switching to alternatives; and more importantly, scores would function as a feedback mechanism on one's contributions, thus enhancing their basic need for competence.

4.4   Limitations and future research

As with all social science research, this dissertation was faced with a number of trade-offs and limitations that are worth mentioning. These limitations are associated with certain assumptions and methodological decisions. This section is dedicated to discussing the acknowledged limitations, the rationale behind accommodating them, as well as the future research avenues that they open.

Firstly, the lack of empirical evidence – while relying predominantly on conceptual and theoretical argumentation in articles I and II – is an obvious limitation of the organizational perspective of the dissertation. Nevertheless, this methodological choice has contributed to filling a recognized theorizing gap in organizational level crowdsourcing research (see, Schlagwein & Bjørn-Andersen, 2014). Conceptual work is much needed particularly for connecting the link between the positivist and interpretive understanding (see the integrative framework of understanding in section 2.1). It is only natural that future studies build on this dissertation's conceptual work in their efforts to generate new knowledge. For instance, future interpretive studies could utilize

the complexity theory as theoretical framework to investigate and analyze how successful solutions emerge from chaotic and seemingly unorganized crowds. Also, future positivist studies may investigate the hypothesized relationship between careful crowdsourcing and organizational performance.

Secondly, the empirical investigation of the individual perspective of this dissertation – articles III and IV – adopts a qualitative methodology, and relies on a limited number of participants. While this methodological choice enabled an in-depth interpretive understanding of the studied phenomenon; the disadvantage of such methodological choice is that it limits the findings' generalizability to domains beyond the studied context. However, as Lee and Baskerville (2003) have extensively explained, there are different types of generalizability that fit different types of research, and that qualitative research, such as the one at hand, can make analytical generalizability claims, that is, generalizability from empirical statements to theory (i.e., ET generalizability). These statements – which may be described as a mid-range theory (Gregor 2006) – can easily lead to testable hypotheses, and as such form the basis for generating positivist understanding (Lee, 1991).

Thirdly, the generation of primary data utilized computer mediated communication (CMC) strategy, which might have moderated the richness of the interview context. For instance, observing visual representations like body gestures, facial expressions and the surrounding visual and spatial organization of the social life (Moisander & Valtonen 2006) would have added to the richness of our analysis. Nonetheless, it is long established that richness or leanness is not an inherent property of electronic communication per se; rather context-dependent (Lee, 1994). As such, CMC interviewing should not be perceived as better or worse than face-to-face interviewing; rather it is merely a different qualitative approach, with its own set of potential merits and limitations (Brabham 2010). The merits include for instance enabling the freedom of choice for the interviewees as to the time and place they preferred and felt most comfortable with, thus, mitigating the difficulties and awkwardness of formal face-to-face interactions.

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Appendices

Appendix 1: Interviewees' demographics and dates of interviews

Name*	Interviewee Location	Age**	Sex	Occupation	First Interview Round	Second Interview Round
Scoopshot Management						
Nico	Finland	--	M	Scoopshot CEO	Feb 2012	--
Petri	Finland	--	M	Scoopshot COO (founder)	Feb 2012	--
Scoopshooters						
Ali	Finland	37	M	Marketer and entrepreneur	Apr. 2012	Aug. 2014
Anita	The Netherlands	27	F	Social media marketing	May 2012	May 2014
Anon-1	Hong Kong	27**	M	News reporter	Apr. 2013	--
Anon-2	Canada	21	M	Student/salesman	--	Dec. 2014
Björn	Sweden	42	M	Professional chef	Oct. 2012	May 2014
Cesar	Chile	26	M	Retail store worker	May 2012	May 2014
Daan	The Netherlands	17**	M	Part-time bartender	Sep. 2012	--
Earvin	The Netherlands	19**	M	Journalism student/marketer	Sep. 2012	--
Gabor	The Netherlands	35	M	Professional Journalist	--	Dec. 2014
Jackie	The Netherlands	46	F	Restaurant worker	Apr. 2012	June 2014
Jari	Finland	38	M	After-sales manager	May 2012	Sep. 2014
Joost	The Netherlands	30	M	School teacher	Apr. 2013	May 2014
Kaisa	Finland	29	F	Food engineer	May 2012	Sep. 2014
Marco	Mexico	27**	M	Communication Engineer	May 2013	--
Max	Austria	21**	M	Shop assistant	May 2013	--
Pekka	Finland	40	M	Car parts dealer	--	Nov. 2014
Peo	Sweden	45	M	Operations manager	May 2012	Sep. 2014
Vasco	The Netherlands	33	M	Factory worker	May 2012	May 2014

* Except for Anon-1 and Anon-2, all participants have agreed to be referred to by their real first names.

** For those who did not participate in the second interview round, age corresponds to the first interview round.

Appendix 2: Interview protocol for article III

Session Introduction:
- I am doing my research on Scoopshot and I would like to hear from you about your experience.
- So, first of all, give me some basic info about yourself (age/sex/country/ occupation)?
- What phone do you have?
- So how many photos in total have you sent?
- And how many were sold?
- So do you use your phone camera or a standalone camera?

Initial Adoption:
- How did you hear about Scoopshot?
- When did you hear about Scoopshot?
- What was the most interesting aspect in the advertisement about Scoopshot?
- I mean, as first impression, what was the most interesting thing about this app?
- How was it introduced in this article?
- Ok, so why did you decide to install it on your phone?
- How about the tasks: do you only take task photos; or do you also submit photos without requests?

Post Adoption:
- Now that you have been using Scoopshot for a while, could you think of all possible reasons that made you keep on sending photos?
- Clarification if needed
    - I am trying to get all possible reasons why you find Scoopshot interesting.
    - Try to list all reasons that together made you decide to use the App.
    - So, if you think of all possible reasons that together made you decide to go and take that photo; can you describe them?
- Imagine that Scoopshot does not offer money for photos. Would you still participate?
- If the answer is *yes*:
    - Why would you bother? Could you elaborate?

- o How does having a photo published impact you personally (if it was for free)?
- o What if the task is not related to your work? Would you take it?
- So, how many newspapers have you submitted photos to? Which ones are they?
- Now that these newspapers are using normal people photos (amateurs) in their papers, how do you think this impacts the paper's image? positively, negatively, or not at all?
- If the response is positive:
  - o I had an earlier interview with a professional photographer who had a different opinion. He thinks that photography must remain professional and newspapers should not use low quality phone camera photos.
  - o What do you think about that? How would you respond to that? as an amateur photographer then as a reader?
- What was your favorite task? And what exactly did you do?

Ending the Interview Session:
- How do you think Scoopshot could be improved?
- How about feedback on your photos? Do you think it is important to get some feedback on the photos you submit? or you don't care?
- By the way, may I use your real first name in my research, which could be published in an academic journal?

Thank you very much for your time and patience. May I contact you again if I have more questions?

Appendix 3: Interview protocol for article IV

<u>**Opening Session:**</u>

- Hi ------! I hope you remember our talk a while ago. As a reminder, my focus is on understanding usage behavior of information systems, and I've been doing my investigation on an application called Scoopshot, and I would like to hear from you about your experience.
- Now, I'm basically investigating how your Scoopshot experience has evolved? Still using it regularly? Not so often? Or stopped using it?
- Do you still use Scoopshot?
- When was the last time you used it?
- To organize our discussion, I will be interested in hearing from you about three phases over time:

    1) The time when you first heard of Scoopshot and decided to try it out.

    2) The time when you used it quite regularly.

    3) The time when you started losing interest, and eventually uninstalled it.
- Do these three stages describe what you've been through over time?

<u>**Core Questions:**</u>

- In the previous interviews we had about a year ago, you were still in the "user" stage. Today, you are not. I am trying to understand exactly (and as clearly as possible) how and why this happened?
- Simply put, could you explain how you went from stage 2 to stage 3?
- So, what was the biggest disappointment in your Scoopshot experience? I mean features that you expected it to have but weren't there?
- So, in your opinion what kind of features might have interested you to keep using it?
- Would these features keep you interested even if you are not getting paid for your photos?
- So, how long did it take before you decided to remove it from your phone?
- How do you think Scoopshot could be improved?
- I mean, what could the app have done differently to make you more interested, and using it today?
- So, do you think that the availability of other photo apps (like Instagram) affected how you evaluate Scoopshot?

- So, if Instagram did not exist, what are the chances of you using Scoopshot today?
- Have you felt any kind of loss by removing Scoopshot?

<u>Ending Session:</u>
- By the way, may I use your real first name in my research, which could be published in an academic journal?
- Thank you very much for your time and patience!
- May I contact you again if I have more questions?

PART II: ORIGINAL ARTICLES

Article I

Poutanen, Petro; Soliman, Wael; Ståhle, Pirjo (Forthcoming): The complexity of innovation: An assessment and review of the complexity perspective, *European Journal of Innovation Management*, pp. 1–33.

Please, note.

Article I related with this publication has been omitted due to restrictions by the journal publisher.

Article II

Soliman, Wael (2013): Crowdsourcing as a sourcing strategy for the ambidextrous organization, in the *Proceedings of The XXIV ISPIM Conference - Innovating in Global Markets: Challenges for Sustainable Growth Conference* held in Helsinki, Finland on 16 to 19 June 2013. ISBN 978-952-265-421-2.

Crowdsourcing as a Sourcing Strategy for the Ambidextrous Organization

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Abstract: People-driven, ICT-enabled innovations have initiated a process of disruption in the journalism industry. In such turbulent environment, many players have retired, and many are yet to come. Surviving these complex conditions require a level of organizational ambidexterity that maintains a balance between exploitation of the known and exploration of the unknown, and embraces risk-taking as a part of the evolution process. Focusing primarily on the content sourcing process in journalism, this paper provides a theoretically driven discussion (supported by real life examples) on the relationship between the organization, the crowd and technology. As such, the paper contributes to the ongoing discussion on the relationship between journalism and the crowd with two questions in mind: to what extent does the crowd represent a threat to the journalism industry? And to what extent could news organizations utilize this threat as a source of opportunity?

News was a broadcast, from one to many. We live in the network age now, where the many can talk to the many, bypassing the one completely.

- John Kelly (2009)

1   Introduction

Markets, industries, firms, and most importantly jobs are being created and destroyed by discontinuous innovations. It is said that an industry is witnessing a discontinuous innovation when it experiences significant changes in its value creation process (Michel et al. 2008). There is strong evidence that the media industry (i.e., all types of audio, video and textual mass communication channels) is witnessing such discontinuity, mainly due to the rapid development in (and adoption of) information and communication technologies (ICT). This paper focuses its attention to journalism for two reasons. First and foremost, journalism is one of the fundamental pillars of a functioning democracy; that it is often referred to as the fourth estate. Second, the journalism industry represents a clear illustration of an ongoing disruption. Recent market assessments show that the economics of news production and distribution have been radically altered, so that publishers in most OECD countries face a substantial decline in circulation, revenues and employment levels (OECD 2010). An earlier report shows that professionals in the media industry view user generated content (UGC) as a major challenge the industry is facing (Accenture 2007).

From a supply chain management (SCM) perspective, journalism revolves around the sourcing and dispatching of content (Graham & Smart 2010); something the OECD (2010) report refers to "the economics of news production and distribution" (p.6). Thus, studying the impact of changing operating environment on these two processes (content production and distribution) are of utmost importance. This research, however, focuses mainly on the upstream activities (i.e., content sourcing) - more specifically, the news organization's sourcing strategy. Two interrelated factors are argued to have caused/catalyzed this disruptive effect on the journalism industry: pervasiveness of ICT, and the crowds. Combined, these two factors have given rise to what is broadly referred to as citizen journalism; that is the act of non-journalists doing the things that only journalists used to do (Kelly 2009). As such, this novel type of non-professional journalism has attracted much criticism, particularly by journalists trying to protect the boundaries of their profession (Witschge and Nygren 2009). Citizen journalism has been mainly criticized for its unreliability and chaotic, "spaghetti-like" networked subjectivity (Maher 2005).

In parallel to this development, technology has enabled the emergence of a new mode of production: crowdsourcing, i.e., outsourcing to the crowd (Howe 2006). As such, crowdsourcing in the context of journalism is seen as a model for distributing the reporting function across many people (i.e., crowd) (Kelly 2009, p.18); or generally as a sourcing strategy that bridges an organization with motivated and capable crowds. The study of crowdsourcing is still in its infancy (Estellés & González 2012). In the context of journalism, crowdsourcing is a novel and under-researched topic (see e.g., Frohlich et al. 2012; Soliman & Tuunainen 2012; Väätäjä 2012), and very few have pointed to the potential value of crowdsourcing in journalism at the institutional level (Robinson 2013).

With this backdrop in mind, this theoretically-driven research is set out to investigate the role of chaos on organizational survival in turbulent environments. Particularly, the

relationship between journalism and ICT-equipped crowds; to what extent the crowd represents a threat to the journalism industry; and to what extent organizations operating in this industry may utilize this threat as a source of opportunity. The remainder of this paper is organized as follows: Section 2 discusses the nature of disruption the journalism industry is facing. Section 3 reviews the latest development on crowdsourcing, and discusses how it is framed as a sourcing strategy for ambidextrous organizations and its potential impact on sustainable competitive advantage. Finally, section 4 is dedicated to some concluding remarks.

2   Industry in Distress: What is the Problem?

Journalism is one of the fundamental requirements for democratic societies. It is evident, however, that the journalism industry is facing a major challenge in its traditional value system. In the same fashion that the introduction of radio and TV had disrupted the journalism practice after a long period of stability; we are witnessing yet another disruption, particularly due to modern technologies (e.g., the Internet, web 2.0, etc.) and the radical impact these technologies have on how news are produced and consumed. The term Web 2.0 technologies is commonly used in reference to the integration and interaction of products and services such as smartphones, location-aware services, social media and user generated content (hereafter, UGC) (Tingling et al. 2011, p.33). A recent market assessment shows that UGC is viewed as a major threat the media industry is facing (Accenture 2007). The OECD (2010) report shows how the economics of news production and distribution have been radically altered, so that publishers in most OECD countries face a substantial decline in circulation, revenues and employment levels. McIntire (2011) points out that the change to digital content is catastrophic to those whose careers are focused on moving materials.

Relatively easy-to-use and inexpensive communication tools, when combined with ubiquitous crowds create an unprecedented distributed problem-solving model. As such, ICT-enabled crowds have become a major threat, and a direct cause of disruption, to the traditional way how the journalism profession is perceived and performed in the news business. Taken together, this has given rise to what is usually today referred to as "citizen journalism". The term has evolved to broadly describe the act of non-journalists doing the things that only journalists used to do; such as witnessing, reporting, capturing, writing and disseminating (Kelly 2009).

Many terms have been used to describe this phenomenon; it has been called citizen journalism, crowd journalism, layman journalism and open source journalism, among many others. Frohlich and colleagues (2012) give a comprehensive review of these terms and the slight differences between each of them. What can be taken away from these different definitions is that community journalism reflects an alternative (i.e., democratic, networked) mode of content production; where "producers do not make a living out of the production" of what they produce (Frohlich et al. 2012, p.1045-1046). A conflict arises when two different perceptions of UGC are contrasted: that of the professional and that of the amateur. In their study, (Witschge & Nygren 2009) report that "most journalists consider themselves to have the sole right in producing news ... they view news as being tied to journalism and do not (want to) envisage other spaces as creating news" (p. 51-52). Obviously, open source news communities see the situation differently; they believe that the current journalism model does not satisfy all their needs. Whatever side of the argument we take, it seems certain that the impulses underlying the rise of

citizen journalism are here to stay, ensuring that citizen journalism will, in some form, be a part of whatever form of media is standing after the current shakedown (Kelly 2009, p.4).

In his address to the Canadian Journalism Foundation, John Paton (2012) sums up the nature of the challenge the journalism business is facing today, and argues that journalism needs letting go of the things that were once held true. He explains: *"Things like we are the gatekeepers of information. That we are the agenda setters and that we decide what news is and what is not. And that we keep the Outside world outside and only let in the chosen few – people like us ... Our traditional journalism models and our journalistic efforts are inefficient and up against the Crowd – armed with mobile devices and internet connections – incomplete"* (Paton 2012).

3   Crowdsourcing

Whereas some journalists view the crowd as a major threat and fight against them; others view the crowd as an opportunity and try to utilize them. Crowdsourcing can offer such opportunity. Crowdsourcing is a relatively new phenomenon, still in its infancy (Estellés & González 2012). The term "crowdsourcing" was popularized by Jeff Howe (2006) who defined it as the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call. Interestingly, the act of inviting unknown crowds to participate in solving a challenge had existed in the pre-ICT era, for example the Oxford English Dictionary (OED) was a crowdsourcing project that started in the 19th century and took 70 years to complete (Lanxon 2011). However, advances in ICT in general, and web 2.0 technologies in particular, have played a significant role in shaping the generic framework within which crowdsourcing operates today. To get a deeper understanding of the different crowdsourcing capabilities, it is good to look at crowdsourcing from different perspectives. From typological perspective, crowdsourcing involves three layers of actors: 1) *the client layer* – usually a company that has a task that needs to be fulfilled, sometimes referred to as "the seeker"; 2) *the crowd layer* – usually formed of individuals who are willing and able to perform the specific task as defined by the client company; and 3) *the platform layer* – usually in the form of an Internet-based marketplace through which tasks are announced to the crowd. The platform can be either operated directly by the client company, or it can be moderated by a third party (Schenk & Guittard 2011). From task fulfillment frequency perspective, two dominant models are observed: the one-off approach and the continuous supply approach. The one-off task approach can be exemplified by the "Netflix Prize[1]", where Netflix sought help from the crowd to solve a non-recurring challenge. The continuous supply approach, on the other hand, represents a company that seeks help from the crowd to fulfill a frequently occurring challenge. This can be exemplified by "Threadless", the T-shirt design crowdsourcing platform (Brabham 2010).

Afuah and Tucci (2012) point out that firms have three alternative approaches to sourcing: *'Internal'* sourcing; *'out'*-sourcing and *'crowd'*-sourcing. By choosing internal sourcing, the organization will search the solution among its employees – for example, reporters on the newspaper's payroll. By choosing outsourcing, the supply landscape will

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[1] http://www.netflixprize.com/

be extended to those designated suppliers – for example, external news agencies. Finally, by choosing crowdsourcing, the organization will resort to the crowd as suppliers of content. From a supply chain management perspective (Mentzer et al. 2001), sourcing/purchasing strategy represents a critical driver for business performance, mainly due to its role in enhancing our understanding of the buyer-supplier relationship (Kraljic 1983; Pagell et al. 2010). From this perspective, crowdsourcing is considered "a sourcing strategy, by which an organization broadens its procurement channels through the careful integration of the crowd as a supplier". Framed this way, the following section theoretically examines the role of crowdsourcing on organizational survival, and its sustainable competitive advantage.

3.1   The Crowd, Chaos and Organizational Ambidexterity

A major premise of this article is that organizations resemble in their behavior living organisms. They are not eternal. Some organizations fade away sooner than others; and that those who last the most are the ones that learn from their environment and co-evolve with it. This premise is influenced mainly by two streams of organizational studies: the study of organizational ambidexterity (Tushman & O'Reilly 1996; Raisch et al. 2009), and the application of complexity theory to organizations, i.e., the organization as a complex adaptive system (Burnes 2005; Carlisle & Mcmillan 2006). Broadly speaking, organizational ambidexterity refers to the ability of balancing between exploitation and exploration activities; whereas, complex adaption refers to the ability of self-organizing and keeping a balance between order and chaos. While using different terminologies, these two streams have many similar assumptions for how they depict organizations, that one could argue that ambidextrous organization is in fact a representation of the complex adaptive system (hereafter, CAS) (see figure 1, for a conceptual illustration).

Both streams reference March's (1991) seminal work on organizational learning; according to which organizations are best illustrated as a living organism aiming for survival through adaptation to their environment (Tushman & O'Reilly 1996; Burnes 2005; Carlisle & Mcmillan 2006; Raisch et al. 2009). Both complexity and ambidexterity studies point out that organizational survival is contingent upon keeping a balance between exploitation of old certainties and exploration of new possibilities, and that self-destruction can be a result of an imbalance between these two activities. Actually, several studies have found and reported a positive correlation between the ambidexterity construct and organizational performance and sustainability (see e.g., Gibson & Birkinshaw 2004; He & Wong 2004; Rothaermel & Alexandre 2009). Whereas the term ambidexterity was originally coined to describe an organization's ability to balance between exploitation and exploration activities; recent development has extended the term to describe a firm's ability to simultaneously balance any activities that are in a trade-off situation (Rothaermel & Alexandre, 2009, p.759). In the same vein, ambidexterity from a complex adaptive systems viewpoint reflects an organization's ability to strike a balance between keeping its heritage and seeking new opportunities (Tapsell & Woods 2010); between the known and the unknown; or simply between order and chaos (Burnes 2005). Firms behave this way because if it is too stable, nothing changes and it risks ossification; and if the firm is too chaotic, it is overwhelmed with change and risks disintegration. Although survival of a CAS is not certain; it will try to increase its surviving chances by trying to operate at the edge of chaos (Carlisle & Mcmillan 2006). It is extremely important to make a distinction between operating on the

edge of chaos (i.e., zone of emergent complexity) and operating under complete chaos (i.e., randomness). Embracing the chaos of the unknown does not equate with complete loss of control. Indeed, as Smith and Graetz (2006) put it "After all, if the outcome of complexity is out of the manager's hands altogether, what good is its further study?" (p.853). Only the ambidextrous organization will operate at the zone of emergent complexity, and find an approach to controlled chaos.

Finally both research streams share the view that complexity/ambidexterity manifests itself at different levels of the organization. Whereas organizational ambidexterity is argued to manifest itself on all organizational levels, all the way down to the individual level (Raisch et al. 2009, p.688); complexity theory views organizations as complex adaptive systems nested in larger CAS, and composed of smaller CAS (Pellissier 2012, p.33). For instance, Carlisle and McMillan (2006) discusses the operation between stability and chaos at the accounting and marketing departments level. Similarly, Rothaemel and Alexandre (2009) illustrate how ambidexterity manifested itself at the sourcing strategy level, while Jarvenpaa et al. (2013) illustrate it at the customer socialization strategy level.
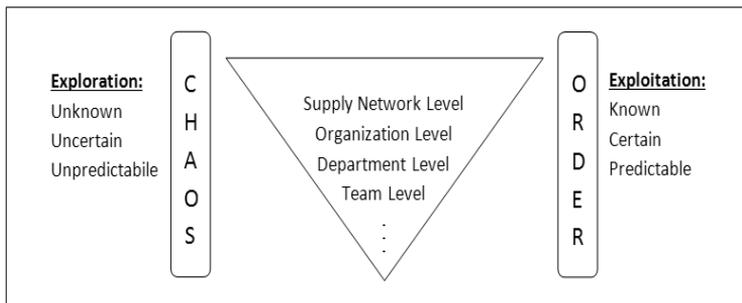
Figure 1. Conceptual Depiction of the "Ambidextrous (CAS) Organization"

Based on this discussion, ambidexterity is applicable to all organizational levels and to virtually any industry. The focus of this paper, however, is primarily on the journalism ecosystem, and specifically at the level of content sourcing strategy. It is strongly argued that the disruption in the journalism industry has already begun, and it is irreversible, and that surviving through this phase will be dependent on each organization's ability to adapt to the rapidly transforming environment. While news organizations may exhibit ambidextrous behavior at all hierarchical levels; ambidexterity at the content sourcing strategy level is exceptionally critical to the news organization's survival. Whereas traditional media organizations have relied predominantly on the professional journalists for their news supply (Graham & Smart 2010); ambidextrous organizations will devise a sourcing strategy that balances the "orderly" professionals' input with the "near chaotic" crowds' input. Not because operating at the edge of chaos guarantees survival; but because it increases its chances. Indeed, organizations neither should underestimate nor overestimate the capabilities of crowdsourcing. While increasing the survival chances, integrating the crowd into the firm's sourcing strategy is not as clean and predictable as the organization might have been accustomed to in traditional sourcing approaches. In fact, crowd generated content will involve false input, noise, and chaos. But that is where

professional journalists and technology play the pivotal role of preventing the organization from deteriorating into complete chaos.

Contemporary ICT provides many tools by which content crowdsourcing can be utilized with three levels of integration in the formal news production process: a) as *quality assurance* of professional journalists' input; b) as a relatively inexpensive supply of the relatively expensive *known input*; and c) as a relatively inexpensive supply of the *unknown input*. First, an ambidextrous sourcing strategy could utilize crowdsourcing as a verification tool to the professional news supply. For instance, The Register Citizen[2] news platform includes online fact-checking boxes on every story they publish, appealing for crowd correction of any mistakes that might have occurred. At the end of each online article, there is a link to a fact-correction report requesting information about the nature of reported error, how it could be corrected, who should be contacted to improve the story, as well as the contact information of the corrector. Second, an ambidextrous sourcing strategy could utilize crowdsourcing as a supplier of known, expensive-to-cover events. For instance, the crowdsourcing mobile application and platform Scoopshot[3] allows news agencies to send specific photography tasks to the crowd of known events (e.g., coverage of a live concert), usually in return of a small financial reward (e.g., 20€). To control the quality of submitted content, only registered users may participate in this platform. Additionally, the mobile application automatically collects time and location stamps of each taken photo, and allows news agencies to connect with the source for further investigation if/when needed. Finally, an ambidextrous sourcing strategy could utilize crowdsourcing as a supplier of unknown (or as-they-happen) events. For instance, the social-media-like platform CNN's iReport[4] allows registered crowds to submit and publish content on the site. Professionals from CNN can then go through all the submitted content and select reports that are suitable (e.g., confirmed breaking news) for airing on the multiple CNN platforms.

To sum, ambidexterity studies inform us that adapting organizations are more likely than others to survive disruptive moments, such the one journalism is experiencing. Similarly complexity theory suggests that by operating at the edge of chaos, organizations will increase their survival chances. Consequently, the author contends that ambidextrous news organizations will be more likely than others to devise a sourcing strategy that keeps a balance between its traditional/orderly and nontraditional/chaotic sources of content provisioning; and that crowdsourcing is the farthest point the ambidextrous organization can reach without deteriorating into complete chaos and disintegration.

3.2 The Crowd and Sustainable Competitive Advantage

In a recent article by Ronald Coase – the Nobel laureate in economics – he criticized the notion that "economics as currently presented in textbooks and taught in the classroom does not have much to do with business management". He highlights how some traditional economics theories have been detached from reality; and concludes that "knowledge will come only if economics can be reoriented to the study of man as he is and the economic system as it actually exists" (Coase 2012). There is little doubt that this critique applies to the neoclassical theory's view of a) *resources*; and b) the impact of

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[2] http://www.registercitizen.com
[3] http://www.scoopshot.com
[4] http://ireport.cnn.com/

sourcing on *sustainable competitive advantage* (hereafter, SCA). In terms of resources, the neoclassical theory views them as land, labor and capital (i.e., factors of production) that are homogenous (i.e., all units of production are identical) and perfectly mobile (i.e., can flow from one firm to the other without restriction) (Hunt & Morgan 1995, p.2). In terms of SCA, the neoclassical theory argues that firms can gain an SCA only from the rare, imperfectly imitable resources. Consequently, sourcing activities (from the assumed perfectly open market) can never be a source of long term competitive advantage (Ramsay 2001, p. 40).

Also, the neoclassical theory would argue that the crowd (generated content) is not a resource to begin with. Even if it is accepted as a resource (as a form of non-contracted labor), the theory would still argue that considering it is an abundant resource, freely tradable, perfectly mobile; crowdsourcing can never be a source of SCA. This argument, Ramsay (2001) points out, is founded on four neoclassical assumptions: functional homogeneity, perfect competitor information, perfect purchased resource mobility, and universal imitation attractiveness. He convincingly contends that this market depiction is an oversimplification of reality and that these conditions are routinely breached in reality. Hunt and Davis (2008; 2012) - picking up Ramsay (2001)'s line of reasoning - argue that purchasing (i.e., sourcing) strategy, and supply chain management in general, need to be grounded in a theory that is based on a research tradition that provides a clean break from the neoclassical theory. They propose that by grounding them in the resource-advantage theory, firms start to get a market perception that is closer to reality than proposed by the neoclassical economics theory (Hunt & Morgan 1995; Hunt & Davis 2008; Hunt & Davis 2012).

While the neoclassical theory views resources as land, labor and capital; the R-A theory takes a more inclusive view of resources; according to which, resources are seen as all tangible and intangible entities available to the organization that enable it to produce efficiently and/or effectively a market offering that has value of some market segment(s) (Hunt & Davis 2008, p.13). More importantly, the R-A theory proposes that firms are in constant pursuit of superior financial performance through two distinct types of advantages: advantages in resources and advantages in marketplace position (as illustrated in figure 2). A comparative advantage may be gained, neutralized, or lost, depending on a firm's own behavior as well as changes in its environment (e.g., rivals efforts, public policy, consumers' tastes, etc.). One of the major contributions of the R-A theory to supply chain management, and sourcing strategy particularly, is that it posits that "when resources are tacit, causally ambiguous, socially or technologically complex, [and/or] interconnected … they are less likely to be quickly and effectively neutralized and more likely to produce a sustainable competitive advantage" (Hunt & Davis 2008, p.16).
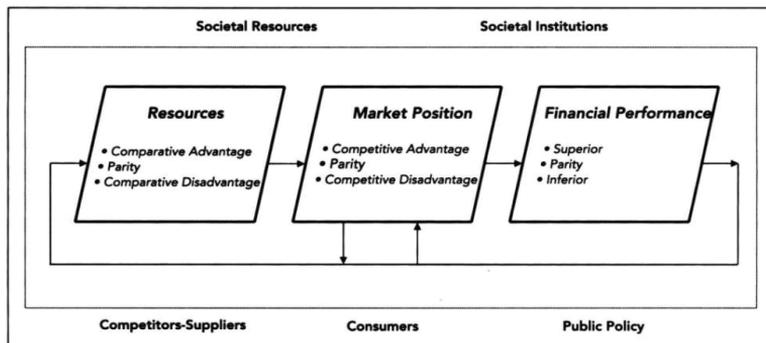
Figure 2: Resource Advantage Theory - Source: (Hunt & Davis 2008)

Framed this way, the R-A theory provides an appropriate lens for news agencies to see the crowd as a resource, and that by devising an effective (crowd)-sourcing strategy, they could attain an SCA. The argument as such represents a stark contrast with that of the neoclassical theory, which would argue that crowdsourcing can never be a source of SCA. Such alternative framing presents organizations with an exploration direction that could yield an SCA.

Having said that, crowdsourcing is a relatively new, near chaotic, socially and technologically complex sourcing model. Despite the many flagship success stories (e.g., the InnoCentive Platform[5] and the Goldcorp Challenge[6]); there are even more (usually untold) stories of failure. These cases have failed for various reasons; it could be because they have failed to engage/motivate the crowd; they have failed to source the relevant/desired contributions; or they have failed to retain/nurture the crowd. For example, Levia[7], a producer of light-based technology aimed at healing the psoriasis disease, tried to crowdsource its advertising commercial; but flopped mainly due to its failure to generate interest among the crowd (Levia 2010). Also, a firm might succeed in motivating the crowd to generate content; just not the desired type. Chevrolet, in an experimentation attempt to tap into the crowd as a source of advertising content for its (then) new Tahoe model, the organization was bombarded with a flood of unexpected/undesired ridiculing content (Brabham 2009). Yet, a firm may succeed to engage the crowd, provoke the correct contributions; but subsequently fails in retaining the crowd. The crowdsourcing platform Cambrian House represents such example. Commenting on the matter, the company's CEO says: "Indeed, our model failed. In short: we became a destination people loved to bookmark more than they loved to actively visit" (Schonfeld 2008). The lessons learnt from these real life stories suggest that crowdsourcing success is contingent upon an array of complex factors, the most important of which are the ability to motivate the crowd; the ability to elicit the right contribution; and the ability to retain and nurture this crowd. Therefore, no one crowdsourcing initiative can be perfectly imitated, the tacit experiences gained from each

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[5] http://www.innocentive.com/
[6] http://www.goldcorp.com/files/Doc_news/02-18-02.pdf
[7] http://www.mylevia.com/

initiative remains within the firm. Only then can crowdsourcing be a potential source for SCA.

To sum, organizations can see the crowd's potential as a resource and its potential impact on the competitive advantage, only when they adopt a theoretical framework that captures such view. This paper proposes that the R-A theory provides a lens with which crowdsourcing can be seen to generate a comparative advantage in resources (particularly the crowd as a resource) that is difficult to neutralize by rivals. At a certain point, the comparative advantage in resources will yield a competitive advantage in marketplace, and eventually a superior financial performance. Consequently, the author contends that news agencies that devise a crowdsourcing strategy are more likely than others to achieve a superior market position; while firms that do not, are more likely to lose their market position.

4   Conclusion

This theoretically-driven research was set out with the purpose of investigating the role of chaos on organizational survival in turbulent environments, with a particular emphasis on the relationship between journalism and the crowd. For this purpose, this research adopted a supply chain management perspective, and accordingly proposed the conceptualization of crowdsourcing as "a sourcing strategy, by which an organization broadens its procurement channels through the careful integration of the crowd as a supplier". Two questions have guided this conceptual endeavor: to what extent does the crowd represent a threat to the journalism industry? And to what extent could news organizations utilize this threat as a source of opportunity?

Regarding the first question, the paper argues that crowdsourcing must not be overestimated; it is not a magic bullet. In no way, crowdsourcing should be perceived as a replacement to the traditional sourcing channels. Rather, crowdsourcing should be perceived as a supplement (i.e., a mere extension) to the organization's content sourcing strategy. The research highlighted the fact that unorganized crowd efforts are inherently unreliable, unpredictable and chaotic. However, modern technology provides the tools with which crowds can be organized and orchestrated. After all, ambidextrous organizations will explore crowdsourcing initiatives to increase their survival chances by operating at the edge of chaos. Framed this way, professional journalists need not fight against disruptive innovations and position the crowd on the enemy side. The change has happened; and as previous research has shown us, adaptability is the key to survival in these environments.

Regarding the second question, the paper shows that by grounding crowdsourcing in the resource advantage (R-A) theory, news/media organizations can redefine their perception of their audience, from the traditional view of a passive consumer to a more emancipatory view as a valuable resource and active co-producer. This paper argued that within the R-A theory framework, gaining SCA is possible; though not guaranteed. Due to the social and technical complexity of the crowdsourcing phenomenon, it becomes relatively difficult for rivals to effectively neutralize the gained comparative advantage. However, this complexity requires a detailed crowdsourcing strategy in which the organization must clarify whether it is building/nurturing a dedicated crowd, or partnering with a third party platform. The crowdsourcing strategy must also clarify the nature and scope of crowd generated content, the rewarding plan, the role of technology

and the verification and authentication policy. Only then can this resource (i.e., the crowd) be a potential source for sustainable competitive advantage.

Professor John Kelly from Oxford University proposes four "musts" for those operating in the journalism business: they must accept that a radical change has happened; must see the public (i.e., crowd) as more than a passive and receptive audience; must explore new ways to tell stories; and they must do all this on the "tilting deck" of today's industry (Kelly 2009, p.2). In conclusion, this article suggests extending Kelly's advice by proposing a fifth must if organizations to survive the current shakedown: they must devise a crowdsourcing strategy, in which they redefine the role of the crowd from passive consumers to value co-creators.

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Article III

Soliman, Wael; Tuunainen, Virpi Kristiina (2015): Understanding continued use of crowdsourcing systems: An interpretive study, Journal of Theoretical and Applied Electronic Commerce Research, vol. 10, pp. 1–18, DOI: 10.4067/S0718-18762015000100002.

Understanding Continued Use of Crowdsourcing Systems: An Interpretive Study

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Abstract

Crowdsourcing as a model for distributed problem solving has been rapidly gaining in popularity. In investigating what drives the solvers to participate in crowdsourcing, the extant research has one-dimensionally only viewed the origins of motivation. While these studies have revealed that crowdsourcing systems' use is driven by both intrinsic and extrinsic motivations, they fall short of explaining how these motivations change over time from initial to continued use. To address this research gap, our study highlights the dynamic nature of human motivation and shows that by including the aims of motivation in the analysis, we can better capture the dynamic nature of motivation across time. With a case study of a photography crowdsourcing platform, we illustrate how the solvers' motivations change from the initial use to sustained participation. While initial use seems to be inspired by selfish motivations, continued use requires both selfish and social motivations to be satisfied. This study contributes to theory by extending our understanding of the motivational factors driving the use of crowdsourcing systems by looking into both the origins and the aims of motivation together with the temporal dimension. It also contributes to practice by providing suggestions in terms of communication strategies for crowdsourcing organizers.

Keywords: Crowdsourcing, Mixed systems, Motivational factors, Adoption, Continued use

1

1   Introduction

In recent years, crowdsourcing as an online, distributed problem solving and production model [7] has gained increased attention from academics and practitioners, alike. Although the term crowdsourcing was only introduced in 2006 [26], the idea of orchestrating a crowd to produce value has been around for centuries. For example, what we know today as the Oxford English Dictionary was in fact a crowdsourcing project that started in the late nineteenth century: laypersons were invited to submit paper slips, each containing an English word and its definition, and the project was successfully completed 70 years later [33]. However, recent advances in information and communication technologies (ICT), particularly Web 2.0 technologies, have increased the possibilities offered by crowdsourcing to a variety of organizations. Crowdsourcing is most often facilitated by an ICT supported platform, through which an organization extends its reach for ideation or problem solving capabilities by integrating the crowd [1]. Information systems (IS) literature has well established the importance of system use as a major success indicator for any IS [15], [31], and this is very much true also for crowdsourcing platforms (i.e., crowdsourcing systems). Hence, it is imperative to understand what motivates the crowd to use crowdsourcing systems, and subsequently provide them with the right mix of incentives that appeal to them and match their motivations [35].

Recent crowdsourcing literature (e.g., [64]) has pointed out that to better understand this phenomenon, we need to understand the users' motivations. Existing studies investigating crowd motivation have drawn us a preliminary picture of the motivational factors influencing the crowdsourcing systems' use. These studies have found that crowd members are driven by both extrinsic and intrinsic motivational factors [8], [17], [58], [65]. While these findings are valuable in suggesting that most crowdsourcing systems serve as dual-purpose systems (i.e., a mix between utilitarian and hedonic information systems [10], [63]); they leave a research area uncharted regarding the change in crowd motivations across time. That is, whether or not the motivational factors that lead to the initial use of a crowdsourcing system and those leading to subsequent and continued use are the same. This is a particularly important question for crowdsourcing systems seeking to establish a long-term relationship with their crowds.

Earlier IS research has shown that omitting the temporal dimension from system usage studies may limit our understanding of the processes of initial adoption and continued usage (see, e.g., [4], [31], [43]). In line with Karahanna et al.'s [31] conceptualization, we define the temporal dimension as the sequence of activities that lead to the initial use and subsequent continued usage of the crowdsourcing system at the individual user level.

In addressing this research gap, our aim is first to understand, then to explain how the crowd participation motivation unfolds from initial to continued use. To this end, following the interpretive research tradition [61], [62], our endeavor has been to produce a plausible explanation of the phenomenon through an iterative sense-making process. This means that our ultimate goal is not to generate *truth or social laws* about the research subject, but rather to provide interpretations of people's interpretations of their worldviews [61]. While the research question was initially designed to investigate the motivational factors influencing the usage of the reported crowdsourcing system, it was at a later stage of the analysis process that it was found important to include the temporal dimension to the theoretical framework. As such, the research question was further developed to provide a deeper understanding of the motivations that drive the initial use of a crowdsourcing system, and whether these motivations remain the same from initial to continued use.

In the next section, we present an overview of previous work related to crowdsourcing initiatives and systems. In section 3, we introduce the theoretical grounding of our study, addressing the motivation theory and the distinction made between initial and continued use. We then describe the empirical context of our study and the research methodology, the data collection and analysis process utilized, in sections 4 and 5 respectively. Discussion of the study's findings is presented in section 6. Finally, in sections 7 and 8 we discuss the limitations of the study, then provide a summary of conclusions, and suggest directions for future research.

2   Related Work

Crowdsourcing has been defined as a type of participative online activity in which an individual, an institution, a non-profit organization or a company proposes via a flexible open call voluntary undertaking of a task to a group of individuals of varying knowledge, heterogeneity, and numbers [18]. Contemporary crowdsourcing is most typically a web-enabled information system [16] with "network platform construction and network connectivity of potential participants" [52]. p. 73. In this sense, crowdsourcing IS - as a platform or a marketplace for *seekers* (the crowdsourcers, buyers of ideas or solutions) and *solvers* (the crowd workers, suppliers of ideas or solutions) - facilitates sharing of demand and supply information and supports various crowdsourcing transactions. When the crowdsourcing platform is managed and operated by a third party connecting seekers and solvers, revenue is usually generated by charging commissions from the seekers [52]. Crowdsourcing has also been conceptualized as a sourcing strategy, by which an organization broadens its solution landscape (e.g., procurement channels) through careful integration of the crowd as suppliers [1], [53].

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Previous crowdsourcing literature distinguishes between crowdsourcing systems depending on the nature of crowd contributions [51]. *Integrative crowdsourcing* is complementary by nature in that a single contribution has very little value on its own, but the value stems from the large amount of input from the crowd. Examples of this type include services like text digitization services, such as, DigiTalkoot, reCaptcha [60], crowd-funding [42] and different forms of crowd voting and crowd ranking [6]. Waze is yet another example of integrative crowdsourcing. It is a navigation application that is aimed at improving the driving and routing guidance by integrating real-time crowd generated traffic data. *Selective crowdsourcing*, in turn, implies that the crowd is solicited to provide solutions to a particular problem or a task, and that the seeker may choose and reward the best contribution(s). In this form of crowdsourcing, contributions are competitive in nature, meaning that the seeker expects that someone in the crowd will deliver an optimal solution, and that single solution will be rewarded. A well-known example of this crowdsourcing type is Innocentive with its business model centered on announcing science problems and soliciting solutions to them from the crowd, while charging a fee from the seeker [28]. Crowdsourcing has also been utilized by firms as an approach to user-driven open innovation [17], [35]. For instance, Starbucks launched its *MyStarbucks Idea* as a social media platform where members in the community (i.e., solvers) were encouraged to propose ideas, promote innovations and give feedback on forthcoming products [20]. Similarly, Dell launched its *IdeaStorm* to engage its wide user base in search of ideas to help Dell regain its market position [21]. In the area of open service innovation, Finnish airline Finnair co-created new service ideas with an online community in its *Quality Hunters* campaigns [27].

From the perspective of recurrence of the crowdsourcing task(s), we can distinguish two different models: the recurring and non-recurring (one-off) approach. The *non-recurring task model* is exemplified by the movie *Iron Sky*: the crowd was involved both in the funding and developing of this filming project. Another example of a non-recurring task is *Netflix Prize* (a provider of on-demand Internet streaming media). Netflix sought help from the crowd to solve a single non-recurring challenge related to its recommendation system algorithm. A firm that seeks help from the crowd to fulfill frequently occurring assignments represents, in turn, the *recurring task model*. Content crowdsourcing in the media industry (news media particularly) exemplifies such approach. The CNN-run iReport platform for instance, allows the crowd to submit and publish content online on a continuous basis. Professionals from CNN can then go through all the submitted content and select reports that are suitable (e.g., confirmed breaking news) for airing on the various CNN platforms. Such platforms are changing the role of consumers who are increasingly becoming participants in the content production and value co-creation processes. Table 1 lists a number of crowdsourcing examples categorized according to the recurrence and contribution dimensions.

Table 1: Crowdsourcing examples based on task nature and recurrence

CONTRIBUTION	RECURRENCE	
	Non-Recurring (One-Off)	*Recurring*
Integrative	*Iron Sky:* Crowdsourcing & funding of a motion picture (Site 1). *DigiTalkoot:* Crowdsourcing project to digitize the National Library of Finland (Site 2).	*Recaptcha:* Crowdsourcing platform for text digitization and human verification (Site 3). *Waze:* Crowdsourcing platform for community-based navigation information (Site 4).
Selective	*Netflix Prize:* Crowdsourcing of a recommendation system algorithm (Site 5). *MyStarbucks Idea:* Crowdsourcing of product development ideas (Site 6) [20]. *Finnair's Quality Hunters:* Crowdsourcing of service development ideas (Site 7) [27].	*CNN's iReport:* Crowdsourcing of news and content (Site 8). *Dell IdeaStorm:* Crowdsourcing of product development ideas platform (Site 9) *Innocentive:* Crowdsourcing of solutions to science problems (Site 10) [28].

The existing research investigating solvers' motivations to participate in various crowdsourcing initiatives and programs provides us with consistent evidence that both intrinsic and extrinsic motivations are important in influencing the use of and participation in crowdsourcing systems. The findings from the studies listed in Table 2 below support such argument. While these studies add to our understanding of solvers' motivation, they largely ignore the dynamic nature of the relationship between the motivational factors and the system use behavior. This is mainly due to the fact that these studies: a) adopt unitary dimension of motivations, by observing the motivation origin only (i.e., intrinsic *vs.* extrinsic), and b) adopt a static view of the system's use motivations, by making no distinction between initial use and continued use. To fill this research gap, our theoretical and analysis framework extends the motivation origin dimension with: 1) the *motivations' aim* dimension [40] which allows us to distinguish between motivations aiming at the self (i.e., selfish) and motivations aimed at others (i.e., social); and 2) the *temporal dimension* [31] with which we are able to distinguish between the motivational factors that influence the initial and continued usage of the crowdsourcing system. We elaborate on this discussion in the following section.

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Table 2: Reported motivations for participating in crowdsourcing initiatives

Study	Empirical Context	Findings	
		Intrinsic Motivations	**Extrinsic Motivations**
[7]	iStockPhoto	• Creativity and fun.	• Desire to make money. • Develop individual skills.
[17]	SAPiens Idea Competition	• Creative challenge of the contest.	• SAP training offerings. • Monetary incentives.
[35]	SAPiens Idea Competition	*(The authors acknowledge the importance of intrinsic motivations; however, they explicitly exclude them from the focus of the study.)*	• Learning and gaining knowledge. • Direct compensation. • Self-marketing. • Acknowledgement from others.
[3]	1. CrowdSpirit 2. FellowFoce 3. Owela	• Entertainment. • Collective creativity.	• Monetary reward. • Learning new ideas.
[8]	Threadless	• Love and addiction towards the Threadless community.	• The opportunity to make money. • The opportunity to improve skills. • The opportunity to find work.
[65]	Taskcn	• Enjoyment of participating in the contest.	• To gain publicity. *(Money was not significant.)*
[57], [58]	Sanoma Newspaper	• Fun. • Sharing news.	• The opportunity to get monetary reward.

3   Theoretical Grounding

The success of any crowdsourcing initiative or service is first and foremost dependent on attracting and maintaining an actively participating crowd that are willing to use the system. Thus, organizers of such platforms need to provide the right mix of incentives that match the participants' motivations [35]. The study of motivations concerns those processes that give behavior its energy (i.e., strength) and direction (i.e., aim), and at its core it strives to answer how motivation affects behavior's initiation, persistence, change, goal directedness, and eventual termination [46]. With its roots in the field of psychology, Harlow's experimental research in the 1950s [45], and DeCharms' work on motivations' loci of causality in the 1960s [13], the Self-Determination Theory (SDT) represents a broad framework for the study of human motivation and wellbeing [9], [14], [29], [50]. One of the widely accepted assumptions of the theory is that motivations, based on their locus of causality (i.e., the origin) are divided into external (i.e., extrinsic) and internal (i.e., intrinsic) motivations. Extrinsic motivation describes doing something in order to attain some separable outcome, while intrinsic motivation is defined as the doing of an activity for its inherent satisfaction rather than some separable consequence [14], [49], [50].

The *origin dimension* (i.e., extrinsic *vs.* intrinsic) has been widely applied in IS research, and accordingly, information systems have been classified as utilitarian and hedonic IS [59], [63]. Utilitarian or productivity-oriented systems are intended to provide instrumental value to the user, while hedonic or pleasure-oriented systems are intended to provide self-fulfilling value [36], [55]. The underlying assumption is that the purpose of an IS (i.e. whether utilitarian or hedonic) determines the core set of incentives that are required to motivate the use of this system. For utilitarian IS, the defining drivers or incentives are predominantly extrinsic by nature (e.g. perceived usefulness), and for hedonic IS, the drivers are predominantly intrinsic (e.g. perceived enjoyment) [11], [36], [41]. Mixed systems, or dual-purposed systems [10], [23], [63] are information systems that exhibit both qualities: usefulness and enjoyment, that is, both productivity and hedonism. Accordingly, mixed systems are argued to be driven by both extrinsic and intrinsic motivations, as reported by the studies reviewed in the previous section.

Further developments of the motivation theory suggest that supplementing the motivations' origin dimension with the dimension of aims would provide us with a more profound understanding of human motivations. The motivation aim dimension classifies human motivations as selfish (i.e., aimed at the self) and social (i.e., aimed at others) [40]. Behavior with a selfish aim means that the action is intended to serve one's self, while behavior with a social aim means that the action is directed at, or intended to serve the others. For instance, when a person makes a donation at a charity event to support an underprivileged group because helping others makes him/her feel good, this behavior is said to be intrinsically motivated with a social aim. However, if the behavior is driven by a desire to seek publicity among peers in the community, then this behavior would be said to be extrinsically motivated with a social aim. Similar distinctions can be made with the selfish aim as well. Adding the aim dimension to the already established and widely used origin dimension, affords us a finer perception of the human motivation landscape. The motivational factors framework (as depicted in table 3) serves as the underlying theoretical framework guiding our initial empirical inquiry and preliminary analysis.

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Table 3: Motivational factors framework. Adapted from [40]

		ORIGIN	
		Intrinsic	**Extrinsic**
A I M	**Selfish**	*Intrinsic* motivations with *selfish* aim.	*Extrinsic* motivations with *selfish* aim.
	Social	*Intrinsic* motivations with *social* aim.	*Extrinsic* motivations with *social* aim.

Motivation theory also highlights the dynamic nature of motivations. As depicted in Figure 1, motivations are dynamic in nature: their strengths vary over time [46]. The same mix of motivations does not necessarily lead to same behaviors in different circumstances, at different points of time. While different motivations may co-exist over time, their respective strengths can lead to varying behaviors (i.e. Behaviors X, Y or Z in Figure 1). A certain behavior (e.g., IS continuance) is likely to be observed when the mix of motives inducing such behavior is strong. This also means that if and when these motives grow weaker; it is likely that the behavior will no longer take place (e.g., IS continuance turns into IS discontinuance). Hence, we integrate the temporal dimension in our analysis in order to investigate whether or not, as well as how, the solvers' motivations change between the initial and continued use in the case of recurring crowdsourcing tasks.
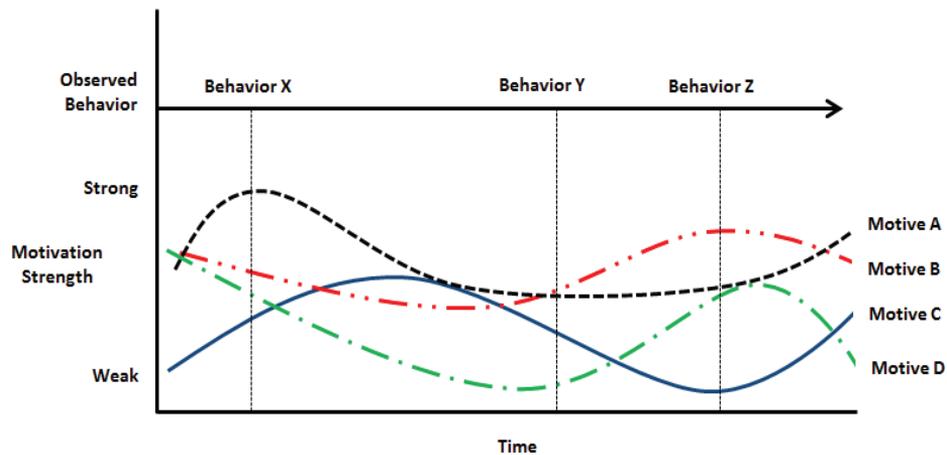
Figure 1: The dynamic nature of motivations. Adapted from [46]

In IS adoption literature, the temporal dimension referring to these different stages has been defined as "the sequence of activities that lead to the initial adoption and subsequent continued usage of an IT innovation at the individual adopter level" [31]. p.184. We make two salient observations from the extant literature addressing the temporal dimension of IS usage [4], [30], [31], [43], [44]. The first observation points to a general consensus that the antecedents (e.g., motivational factors, decisions, or behaviors) leading to the initial use of an IS are different from those leading to the subsequent and continued use (i.e., IS continuance) of that system [4], [31], and that the antecedents associated with initial usage may fail to explain subsequent usage [2], [56]. The second observation is that most of these studies have been conducted with a quantitative approach and user surveys as the research instrument. Therefore, we believe that with the qualitative approach that we have chosen for our study of a photography crowdsourcing platform, we can provide a richer picture of the multifaceted user motivations of initial and continued use of crowdsourcing systems.

4 Case Context

Scoopshot (Site 11) is an ICT supported platform, a form of intermediation described in crowdsourcing literature as solver brokerages [19]. Scoopshot is dedicated to the trade of crowdsourced mobile user generated content, connecting publishing and media agencies (the seekers) with consumers, and enabling consumers as users (the solvers) of the service to be compensated for the content they provide. Founded in 2010, Scoopshot is a Finnish, Helsinki based company, and the popularity of its service has been growing rapidly since the beginning. In 2012, Scoopshot was declared the WSA mobile (World Summit Award) winner in the category of m-Media & News; and in March 2013 it reached third place of most downloaded free mobile applications (apps) in Germany. At least for the time being, the platform does not offer any social networking capabilities for the users to communicate. As such,

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Scoopshot is a prime example of a crowdsourcing platform, where solvers do not necessarily form a networked community, but are using a shared platform to solve a particular task or tasks [16].

Typically, the Scoopshot service works so that a potential solver goes to her app store or market and downloads the smartphone app for free. After installing the app, she creates an account and can immediately access the pool of tasks. Scoopshot's platform allows a solver (also referred to as a *Scoopshooter*) to either respond to a specific pre-defined task, or to upload a photo that she believes is newsworthy. For a pre-defined task, the reward is pre-set, whereas when uploading a photo believed to be of interest to potential buyers, the photographer may set the price she sees fair for her photo. In both cases, the service allows the photographer to complement the photo with some additional descriptive text and location information. To ensure the content authenticity, the Scoopshot app has a built-in verification procedure that flags any edited or altered photographs. In addition, Scoopshooters may provide personal information, such as, a phone number, when submitting the photo for sale. The phone number can be used for additional verification purposes, if and when needed. For instance, a news agency may contact a Scoopshooter directly to ask specific questions about the surroundings of her submitted photo. Figure 2 illustrates how the application's user interface looks on a solver's smartphone.

Currently, Scoopshot has extensive networks of both seekers and solvers. At the seeker side, Scoopshot serves over 60 publishing and media houses in 15 countries across Europe, Americas and Asia. At the solver side, the service has over 350,000 users covering over 170 countries worldwide. The revenue model is based on commission on each photo sale.
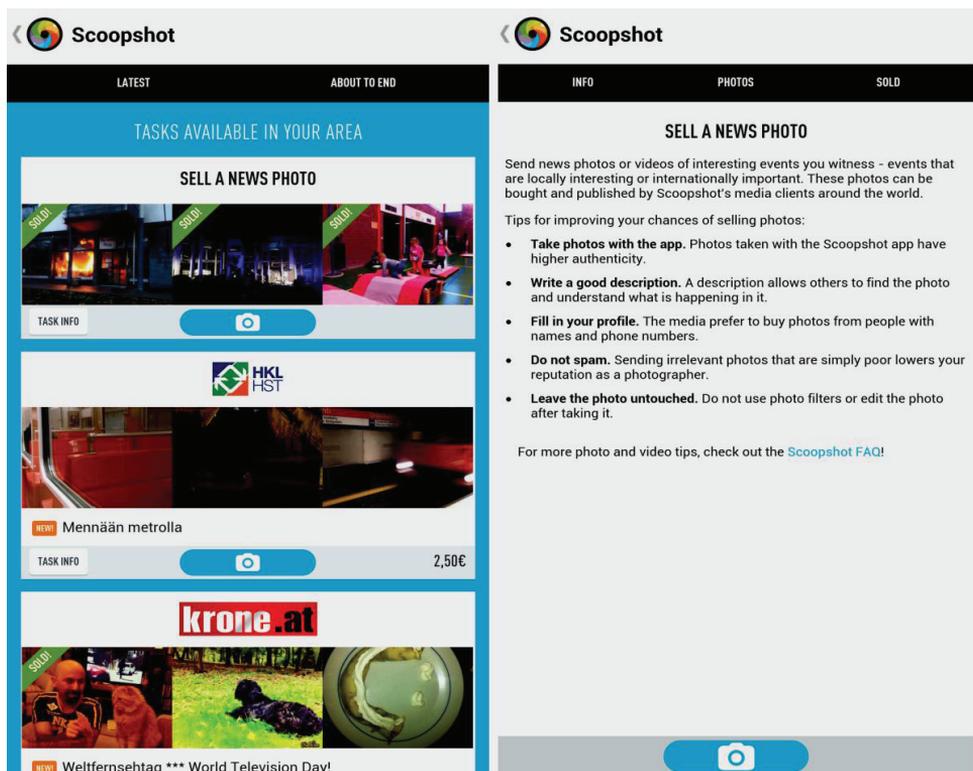
© 2014 Scoopshot. Printed with permission.

Figure 2: Scoopshot user interface

5   Research Approach

In this study, we followed the qualitative tradition of scientific enquiry, best described as the use of qualitative data, such as interviews and documents, to understand and explain social phenomena [39], which "starts from and returns to words, talk, and texts as meaningful representations of concepts" [22]. p. 455.

Series of interviews were conducted with both Scoopshot management as well as the Scoopshooters. With Scoopshot's top management the interviews were conducted with Founder and President (Mr. Petri Rahja) and CEO

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(Mr. Niko Ruokosuo). The management described the rationale of Scoopshot as *trying to make media social; not social media*. In other words, they do not perceive themselves to be competing with other photo-based social media platforms, such as Flickr and Instagram. Instead, they see that Scoopshot offers a unique opportunity for media organizations to utilize the crowd as a constant source of fresh content. This study's main focus however, is on the solvers' side. In total, fifteen interviews were conducted with different Scoopshooters (i.e., content suppliers or solvers). Adhering to the qualitative tradition, purposive (i.e., nonprobabilistic) sampling was utilized in recruiting the interviewees, meaning that the interviewees were selected according to predetermined criteria that was relevant to the research objective [24]. Taking the research purpose into consideration, the selection criteria focused on candidates who have signed up in the Scoopshot platform and who have used the application for at least several months, regardless of whether they have sold a photograph or not. Candidates were then invited to personal interviews by means of emails.

Considering the dispersed geographic locations of the solvers around the world, a computer-mediated communication (CMC) strategy was chosen as a tool for our interviews with those who agreed to participate in the study. The use of synchronous CMC (e.g. instant messaging or chat) enabled the freedom of choice for the interviewees as to the time and place they preferred and felt most comfortable with, as well as the communication channel (e.g. Facebook Chat, Google Talk or Skype) [8], [32]. Such remote interviewing technique has been found to mitigate social desirability bias (the tendency of respondents to provide answers that are more socially acceptable than based on what they truly think), to help in overcoming the possible awkwardness of the interview formality, and to encourage the interviewees to express themselves as openly as possible. Interviews took place between April 2012 and May 2013. The fifteen Scoopshooters included 12 men and 3 women, ages ranging between 17 and 44 years, and with different educational and professional backgrounds. They were geographically located in Austria (1), Chile (1), Finland (3), Hong Kong (1), Mexico (1), Netherlands (6) and Sweden (2). On average, each interview lasted for 120 minutes, varying from 50 minutes to almost 3 hours in one session. Some interviews took place over multiple sessions. A detailed account of interviewees' demographics and duration of each interview is provided in Appendix A. It is worth noting that while the main interview themes remained the same for all interviews, the exact wording and order of some questions differed from one interview to another, depending on the flow of the conversation. An exemplary interview protocol is provided in Appendix B.

The data analysis of our study draws on a reductionist analytic framework [37], [47], which permits the generation of meaningful interpretations and conclusions. Our coding procedures were informed by the grounded theory guidelines [5], [54]. As such, the data went through the three stages of open coding, axial coding and selective coding. A sample of the multi-level coding procedure is provided in Appendix C. In open coding, the aim was to identify general concepts, ideas and perceptions and assigning those to portions of texts. A line-by-line coding process was performed where both theoretical codes as well as *in vivo* codes were used. Here, similar concepts were grouped into higher order categories. For instance, codes like *winning the prize*, *extra income* and *easy money* were all grouped under the category of *financial reward*. In axial coding, relations between categories and sub-categories were created, with a particular emphasis on the nature of these relations (e.g., association, causation, contradiction, etc.). For instance, clear causal relation patterns emerged between *enjoyment* and *continued system use*. Also, one of the most interesting relations that emerged was the contradictory relation between the apparent importance of the financial reward during the initial usage phase, and the interviewees' willingness to participate for free in the subsequent continuous use phase. Finally, in selective coding, core themes explaining the research phenomenon were identified, and trivial themes were eliminated from the final analysis. The importance of selective coding stems from its role in allowing the researcher to saturate the selected categories, while avoiding the inclusion of diverse additional material that has no relevance to the core investigation [25]. It is worth noting that, consistent with the guidelines offered by [24] and qualitative studies similar to ours (e.g., [8]), data saturation was achieved within the first twelve interviews. In practice, information gained from the Scoopshooters after the tenth interview produced little change to the findings.

6 Findings and Discussion

In this section, we present the findings of our study, and discuss both their theoretical and practical implications.

We reflect on the findings as three major stages that emerged during the study's life cycle. The first stage represents an answer to the initial research question regarding motivational factors influencing the solvers' use behavior. Following the traditional one-dimensional view of motivations, the primary aim of this stage is to present a static account of the motivational factors influencing the crowdsourcing system's use behavior, and to compare it with existing research findings.

The second stage of the study represents a reframing of the theoretical lens by utilizing the two-dimensional motivational factors framework. The primary aim here is to present a dynamic account of how the motivational factors leading to the system's initial use are different from those leading to continued participation.

Finally, the *third* stage represents a discussion of a novel finding that emerged from the data: the reinforcing role of feedback on system continuous usage.

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6.1 System Use Motivation: Static View

The initial impetus behind our research was to create a plausible understanding of what drives the crowd to participate in the crowdsourcing system. Although the sense-making process with each interviewee drew on an interpretation of their own personal experiences, through the analysis process we could reach a more holistic understanding of the motivational factors that drove the crowd participation and use of the Scoopshot's crowdsourcing system. Following the traditional one-dimensional approach to motivation analysis, our findings show that both intrinsic and extrinsic motivations have had a strong impact on the system's use. We identified six motivational factors that together have shaped the use behavior. In terms of occurrence in the interviews (as illustrated in Table 4), these motivational factors in order are: the opportunity to gain a financial reward, the opportunity of publicity, enjoyment, curiosity, gaining non-financial rewards (e.g., skill development and future employment), and altruism. Appendix D illustrates a breakdown of each interviewee's motivational factors.

Table 4: Static and uni-dimensional view of motivational factors for scoopshot system use

Intrinsic	Extrinsic
Enjoyment (12)	Financial Rewards (15)
Curiosity (7)	Publicity (12)
Altruism (6)	Non-financial rewards (6)

6.1.1 Financial Reward

Since Scoopshot has marketed its service with the slogan of *Take Photos, Make Money*, it was not surprising that the opportunity to receive a financial compensation for one's mobile photography was reported as the most intriguing aspect when they first heard of Scoopshot, whether in a newspaper ad, on TV or through a friend. Actually, all interviewees highlighted the importance of the financial reward for using Scoopshot. *Vasco*, for instance, recalling what attracted him to use Scoopshot, said: *It [a newspaper] made reference to the application every day, and always focused on the fact that you can make money with photos.* Similarly, *Peo* explained: *Since I am a very active photographer, I see it as an alternative way to spread my pictures and get additional income.* As such, the possibility to make some *easy* or *extra* money, as reported by the interviewed users, clearly exerted a major influence on their decision to use Scoopshot.

6.1.2 Publicity

The possibility to have one's photos published and viewed by peers and the general public also had a major role in forming the system's use behavior. The theme of gaining publicity (i.e., recognition) generated from having one's photos published in a newspaper or a magazine emerged as one of the most influential motivational factors for solvers' participation in the service. To reflect this perception, the interviewees used phrases like [I like to] *get some attention*, *I want my pictures to be seen in newspapers*, and *it gives a kick to see your own picture in the papers*, and most of them admitted that the possibility of having their photos published with their names in a newspaper was enough a reason for them to participate. *Earvin*, for instance, said that he would use Scoopshot even for free, because *now I know how nice it is to see my picture in the papers.* Similarly, *Vasco* stressed the importance of having his photos displayed in the newspapers. *Cesar's* response further highlights the importance of gaining publicity, also from one's peers: *My name was on the newspaper when my photo was selected. For me that was more important than the money; that my friends say: wow Cesar did you take that photo?*

6.1.3 Enjoyment

Enjoyment of using the service was also a repeatedly recurring theme in the interviews. The interviewees used phrases like *just for fun*, *entertainment* and *it feels like a game* to explain why they use Scoopshot, and with only a few exceptions, all interviewees reported enjoyment as a reason for using Scoopshot. *Daan*, for instance, said: *It's really fun; it's exciting. Every day I watch to see if there is a new task. And every new task is a surprise*. Also for *Jackie*, using the application was mainly enjoyment driven, as it made her *feel like a paparazzi*, and she goes on explaining how fun it was to take photos with her son in the forest, and that they *had quite a laugh when sending it*. Similarly, when *Björn* was asked to discuss the most essential features that kept him using the service, he said: *I really enjoy shooting and sharing photos. I am not hunting missions or so. If I see one, and it's in reach so to speak, I'll go for it.*

6.1.4 Curiosity

Interest towards the system was increased by the curiosity to discover and try out a new technology. Phrases reflecting this driver, such as, *interesting idea*, *give it a try* and *try it out*, were commonly used by the interviewees to explain their initial interest, and decision to install the app on their smartphones. *Ali*, for instance, pointed out that he liked the application idea, and that he was initially trying different types of photography apps on his smartphone.

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Earvin explained that seeing how unsophisticated the winning pictures were, it made him curious to try this new app. In addition, as *Jari* pointed out, installing the app was very easy, so he just *thought to give it a try*.

6.1.5   Non-Monetary Personal Gains

Various non-monetary personal gains were found to be important as well. Skill and career-development were evident motivations for some of our interviewees to use the system. For instance, driven by her career ambitions, *Anita* said she wished to improve her photography skills by using the service. She thought that it was important to have her name published with her photos because of her own photography business, and publishing her name would function as *personal branding*. Similarly, *Earvin* expressed his career ambitions in journalism: *I'm studying journalism, and in that way I can always refer to my own work. It can help me getting a job in the future working for a* [news] *paper*. *Peo*, a part-time photographer, saw Scoopshot *as an alternative way to spread* [his] *pictures*.

6.1.6   Altruism

A final motivational factor that emerged from our analyses reflects the users' willingness to help others. This kind of *altruism* reflects the users' willingness to contribute to the service without expecting anything in return. This was evident when the interviewees were asked to explain if and why they would contribute content for free. They used phrases like *happy to help*, *good mood from helping others* and *it is everybody's responsibility to inform what is happening*. *Jari,* for example*,* explained: *I think* [about] *it this way: Why not help if I could help? So it isn't the main thing to me to get the money from helping, though it helps that decision a little… I get good mind of doing that,* [even] *if I would do it for free. I believe in the phrase that if you are good to other people, they are good to you*. This sense of altruism - or obligation towards society - was even more apparent in *Cesar*'s statement: *The main reason* [is] *to inform about a news that not everybody will see … because everybody has the right to know the truth, any truth even when the governments don't want it …* [it] *is everybody's responsibility to inform what's wrong and what is happening*.

The findings as depicted above are consistent with previous research on crowdsourcing systems' use, which on the main has adopted a static, uni-dimensional view of motivations. Our findings support earlier assertions that the motivational factors influencing individual crowd members' decisions to use crowdsourcing systems are an amalgam of both intrinsic and extrinsic motivations (see e.g. [3], [8]). Indeed, while most crowdsourcing systems reflect a utilitarian relationship between an organization and an undefined crowd, with the aim of carrying out specific tasks, user participation is still highly volitional, self-determined and hedonistic values are very likely to be strong influencers. Therefore, we extend this discussion by arguing that crowdsourcing systems, particularly those in the trade of creative tasks, are, by and large, mixed systems that cannot be categorized as hedonic or utilitarian only. The implications of this will be discussed in a later section of this paper.

6.2   System Use Motivations and Temporal Dimension: Dynamic View

While both intrinsic and extrinsic motivational factors were present in both initial and continued use, the interplay between selfish and social motivational factors provides an additional layer of explanation. Our findings indicate that *initial use* is dominated by selfish motivational factors (namely, financial reward and curiosity), while *continued use* is driven by both selfish and social motivational factors. In continued use, neither financial reward nor curiosity played that significant role anymore.

At the beginning of each interview, the interviewees were asked to recall how and when they first heard of Scootshot, and what were the most interesting aspects about this app that made them decide to install it on their smartphones and use it (see Appendix D). The possibility to earn money and curiosity to try a new technology emerged together as the two dominant antecedents to the initial use decision. Then, the interviewees were invited to consider a situation in which Scoopshot would not offer financial rewards anymore, and were asked to reflect on their willingness to continue using the service. The purpose of this question was to provoke the interviewees to re-evaluate the importance of the financial reward amid all other potential motivational factors, particularly since they had all been using the system for a while. It also allowed us to tap into the temporal dimension of the system use by eliciting a response regarding the solver's intention towards continued use. We expected that in the absence of a financial reward, most interviewees would not be willing to continue their participation. However, most interviewees declared without hesitation that they would still participate, even for free. This indicates that the motivational factors that play a strong role for the initial use of a crowdsourcing system do not necessarily remain the same to warrant continued participation.

Combining the dimensions of motivation aim and the origin provided us with a lens through which we were able to capture the changing nature of the motivational factors driving solvers' behavior from initial to continued use (see Figure 3). While selfish motivational factors (particularly the financial reward) played a dominant role in attracting the solvers in making their initial usage decision, social motivational factors (e.g., publicity) distinctly grew in importance during the subsequent decisions. This suggests that before the initial usage stage, when the knowledge about the system is based on information received through different media, an explicit incentive, such as, the possibility to *make easy money* (as described by one of our interviewees) plays a significant role in attracting potential participants. Then, typically fuelled by an additional intrinsic motivation of curiosity, the decision to use the system is made. After gaining familiarity with the system, curiosity is satisfied, and also the importance of the financial reward tapers -

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especially when these rewards are not very substantial, as in Scoopshot's case. For continued use of the system, the initial motivations are then gradually displaced or supplemented with new ones, and these motivations are both selfish (e.g., enjoyment and non-financial gains) and social (e.g., publicity and altruism).

		ORIGIN	
		INTRINSIC	**EXTRINSIC**
A I M	**S E L F I S H**	**Initial Use** Curiosity	Monetary rewards
		Continued Use Enjoyment	Non-monetary rewards
	S O C I A L	Altruism	Publicity

Figure 3: Motivational factors and the temporal dimension

This finding is consistent with earlier IS research in arguing that the antecedents leading to the initial use of an IS are different from those leading to the subsequent and continued use of that system, and that the antecedents associated with initial usage may fail to explain subsequent usage [2], [4], [31], [56]. Indeed, our findings suggest that the motivational factors that influence the initial usage decision would fail to account for and explain continued participation. In fact, overemphasis on the initial use drivers may even hinder the continued use behavior, especially when only a selected few (i.e., winners) actually receive a financial reward.

Earlier research has shown that for utilitarian IS in work context, extrinsic normative pressures from management, supervisors, and/or peers signify the user's initial usage decision [31]. Subsequent continued usage is chiefly determined by the system's instrumental value, which is typically captured in terms of perceived usefulness [12] on one's job and/or career. We call this an *outside-in* adoption process. Our study suggests that for a crowdsourcing system - a mixed IS with both utilitarian and hedonic components - the adoption process operates in a reverse fashion that can be described as an *inside-out* process. In other words, initial usage of the crowdsourcing system emanates from selfish motivations, while subsequent continued use requires the reinforcement of additional social motivations.

6.3   The Reinforcing Role of Feedback

At the end of each interview, the users were asked how they generally felt about Scoopshot and whether they had any recommendations on how to improve the service. Some requested posting more tasks, while others recommended using smarter task customization options. A recurring theme, however, was *the lack of feedback* on one's submitted photos. *Anita*, who runs her own photography venture, explained that *because of the lack of response … the fun could be gone very fast*. To her, a response could be any sort of feedback; something like *at the end of the quest, some kind of response with we're sorry to let you know that you didn't sell anything. This is the picture that did sell*. She explained further: *I would like any response from Scoopshot of the winning pictures so I can learn of the picture type they like. I don't want to have the feeling that I'm doing it for nothing at all*. Similarly, *Ali*, who said he genuinely enjoys photography as a hobby, explained how his interest in the service was fading away: *I don't know why I stopped using Scoopshot. I sent them many good photos and didn't receive any response at the end ... my photos don't look bad … As a result I got a bit tired of the service. I don't send them photos very often nowadays. But I do send them if I'm at the location with a good photo, then I'm almost sure that it will be sold*. Interestingly, he considered the financial reward as a form of feedback. In other words, he compensated the absence of feedback on his photos with the positive reinforcement he gained from the financial reward.

Research in psychology has found feedback on an individual's performance to have a major impact on several outcomes, like work performance, learning and development, as well as motivation [48]. Furthermore, earlier

motivation studies have demonstrated that positive feedback enhances intrinsic motivation, whereas negative feedback weakens it [49]. In organizational context, feedback has been seen as a type of information in the work environment that indicates how well an employee is performing his or her goals. In this sense, feedback operates as a mechanism by which the organization evaluates the quality of relevant work behaviors [48]. Feedback represents a component of the interpersonal events and structures that conduce towards feelings of self-efficacy, and these feelings are important for motivating human actions, because they satisfy our *basic need for competence* [49] p. 58. While the importance of receiving feedback *per se* and its impact on future behavior has been acknowledged in organizational settings and studies of human behavior, to our best knowledge this has been largely ignored by IS researchers studying mixed systems, such as crowdsourcing.

7   Limitations of the Study

Finally, as with all research, the current study was faced with a number of trade-offs and limitations. Firstly, the empirical evidence is from a single case study and a limited number of participants, which might limit the findings' generalizability to domains beyond the studied context. Therefore, we do not claim that our findings are applicable and readily generalizable to all types of crowdsourcing systems, in the sense of statistical generalizability. However, as Lee and Baskerville [34] have extensively explained, there are different types of generalizability that fit different types of research, and that qualitative research like ours can make analytical generalizability claims, that is, generalizability from empirical statements to theory. Secondly, although we made an effort to balance between active and inactive users to gain as much insight as possible about the relationship between motivation and behavior termination as well [46], those who agreed to be interviewed belonged to the former group. Thirdly, our choice of the computer mediated communication (CMC) strategy with the interviewees might have moderated the richness of the interview context. For instance, observing visual representations like body gestures, facial expressions and the surrounding visual and spatial organization of the social life [38] would have added to the richness of our analysis. While acknowledging these limitations, we decided to utilize the CMC strategy after weighing its merits as well.

8   Summary and Conclusions

The main objective of this study was to investigate the motivations that drive the initial use of a crowdsourcing system, and whether these motivations remain the same from initial to continued use. In the empirical context of the Scoopshot platform connecting seekers and solvers of photography tasks, the main drivers were found to be a mix of both extrinsic and intrinsic motivational factors. Intrinsically, the crowd members were driven by curiosity, enjoyment, and altruism, while the main extrinsic drivers were monetary reward, developing one's skill and career, and publicity. We have shown that understanding the motivations to use a crowdsourcing system requires inquiry into both the origins (i.e., extrinsic or intrinsic) as well as the aims (i.e., selfish or social) of these motivations. Furthermore, we have shown how the motivational factors that attract the solvers in the beginning differ particularly in terms of the aim from those leading to continued use. While the initial use seems to be predominantly driven by selfish motivations, continued participation seems to require the interplay of both selfish (aimed at the self) and social (aimed at others) motivational factors.

Our findings have implications both to theory and practice. To theory, the implications are threefold. Firstly, the study extends the crowdsourcing literature by suggesting that such systems are mixed or dual-purpose systems. Secondly, the study extends our understanding of the motivational factors essential to drive the use of a crowdsourcing system by adding the temporal dimension into the analysis. To our best knowledge, this is the first study to highlight the changes that occur in the nature of the motivations from initial to continuous use in the context of mixed systems. Thirdly, the study draws attention to the importance of feedback loops on crowdsourcing systems' usage.

The findings have important practical implications for crowdsourcing organizers or service designers of other services of similar nature, particularly in terms of their communication strategies. Firstly, in terms of the crowdsourcing organizers' communication and marketing strategies, our study emphasizes that system usage is induced by a mix of at least four types of motivational factors, of which the financial compensation plays only a partial role, and particularly for the first time users. The financial incentive alone does not seem to be enough to retain a community of repetitive solvers. As such, adopting the same marketing campaign for attracting new users might not be as effective for retaining them. While highlighting the financial reward aspect might seem effective in attracting curious users to try the service, demonstrating also other values that the system might provide (e.g., personal and societal values) can have a profound effect on retaining and building community of repetitive participants.

Secondly, the possibility to gain publicity or even fame seems to be particularly influential on forming the solvers' decision to continue to use the service. To accommodate this, Scoopshot could integrate an additional motivational component to its services that would satisfy the users' desire to exhibit (i.e., present or display) their work. For instance, the solution to this could be as simple as adding a webpage (i.e., public wall) where unsold photos can be viewed and shared in public.

Finally, feedback seems to have a major impact on solvers' attitude towards the service, and consequently on sustained participation. Another motivational component that appeals to this could be an addition to the previously

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discussed public wall, in which users are allowed to vote (e.g., give the *thumbs-up*) and comment on each other's sold or unsold content. This feedback mechanism could satisfy the basic need of competence within the individual solver, and as a result, this could induce a positive attitude towards the service, and eventually reinforce the behavior of continuous participation.

To fully understand the dynamics and the changing nature of the users' motivations to use crowdsourcing or other mixed systems requires both more theorizing as well as further empirical research. Future studies should investigate the validity of our findings with a wider set of empirical data, and in different IS contexts. Future research should also explore the interplay between intrinsic and extrinsic motivations, and their influence on user participation. In the particular setting of crowdsourcing, deeper understanding of the motivations and changes in them over time with different types of initiatives (integrative and selective, as well as one-off and recurrent) could provide valuable new knowledge on users' motivation formation and sustenance processes.

Websites List

Site 1: Iron Sky
http://www.ironsky.net/

Site 2: DigiTalkoot
http://www.digitalkoot.com

Site 3: Recaptcha
http://www.google.com/recaptcha

Site 4: Waze
http://www.waze.com

Site 5: Netflix Prize
http://www.netflixprize.com

Site 6: My Starbucks Idea
http://www.starbucks.com/coffeehouse/learn-more/my-starbucks-idea

Site 7: Finnair's Quality Hunters
http://www.qualityhunters.com

Site 8: CNN's iReport
http://www.ireport.cnn.com

Site 9: Dell IdeaStorm
http://www.ideastorm.com

Site 10: Innocentive
http://www.innocentive.com

Site 11: Scoopshot
http://www.scoopshot.com

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Appendix A: Interviewees' Demographics and Interviews' Durations

With one exception, all interviewees have approved to be identified with their first names.

Name	Location	Age	Sex	Occupation	Interview	
					Date	Duration
Ali	Finland	35	Male	Marketer and entrepreneur	18.04.2012	130 min
Anita	Netherlands	25	Female	Part-time photographer, waitress and intern at an advertising company	10.05.2012	180 min
Anony mous	Hong Kong	27	Male	News reporter	17.04.2013	140 min
Björn	Sweden	40	Male	Professional chef	09.10.2012	80 min
Cesar	Chile	24	Male	Part-time worker at a retail store	13.05.2012	150 min
Daan	Netherlands	17	Male	Part-time bartender	29.09.2012	90 min
Earvin	Netherlands	19	Male	Part-time electronics marketer	24.09.2012	150 min
Jackie	Netherlands	44	Female	Waitress at a *lunchroom*	16.04.2012 / 18.04.2012	180 min / 120 min
Jari	Finland	36	Male	After-sales manager	17.05.2012	120 min
Joost	Netherlands	29	Male	School teacher	11.04.2013	110 min
Kaisa	Finland	27	Female	Engineer in the food industry	17.05.2012	100 min
Marco	Mexico	27	Male	Solution engineer at a communication company	07.05.2013	80 min
Max	Austria	21	Male	Shop assistant	07.05.2013	70 min
Peo	Sweden	43	Male	Operations manager in a petroleum company and part-time photographer	08.05.2012	120 min
Vasco	Netherlands	31	Male	Worker at a benzene factory	09.05.2012	120 min

Appendix B: Exemplary Interview Protocol

Session Introduction + Basic Information:
- I am doing my research on Scoopshot and I would like to hear from you about your experience.
- So, first of all, give me some basic info about yourself (age/sex/country/occupation)?
- What phone do you have?
- So how many photos in total have you sent?
- And how many were sold?
- So do you use your phone camera or a standalone camera?

Initial Adoption:
- How did you hear about Scoopshot?
- When did you hear about Scoopshot?
- What was the most interesting aspect in the advertisement about Scoopshot?
- I mean, as first impression, what was the most interesting thing about this app?
- How was it introduced in this article?
- Ok, so why did you decide to install it on your phone?
- How about the tasks: do you only take task photos; or do you also submit photos without requests?

Post Adoption:
- Now that you have been using Scoopshot for a while, could you think of all possible reasons that made you keep on sending photos?
- Clarification if needed
    - I am trying to get all possible reasons why you find Scoopshot interesting.
    - Try to list all reasons that together made you decide to use the App.
    - So, if you think of all possible reasons that together made you decide to go and take that photo; can you describe them?
- Imagine that Scoopshot does not offer money for photos. Would you still participate?
- If the answer is *yes*:
    - Why would you bother? Could you elaborate?
    - How does having a photo published impact you personally (if it was for free)?
    - What if the task is not related to your work? Would you take it?
- So, how many newspapers have you submitted photos to? Which ones are they?
- Now that these newspapers are using normal people photos (amateurs) in their papers, how do you think this impacts the paper's image? positively, negatively, or not at all?
- If the response is positive:
    - I had an earlier interview with a professional photographer who had a different opinion. He thinks that photography must remain professional and newspapers should not use low quality phone camera photos.
    - What do you think about that? How would you respond to that? as an amateur photographer then as a reader?
- What was your favorite task? And what exactly did you do?

Ending the Interview Session:
- How do you think Scoopshot could be improved?
- How about feedback on your photos? Do you think it is important to get some feedback on the photos you submit? or you don't care?
- By the way, may I use your real first name in my research, which could be published in an academic journal?

Thank you very much for your time and patience. May I contact you again if I have more questions?

Appendix C: Sample of Quotes and Multi-Level Coding

Quote	Codes	Level-I Category	Level-II Category
Cesar: *I like the idea of making some money taking photos.*	Making Money, Financial Reward	Financial Reward	Extrinsic-Selfish
Peo: *Since I am a very active photographer, I see it as an alternative way to spread my pictures and get additional income.*	Additional Income, Making Money, Financial Reward		
Earvin: *I'm studying journalism, and in that way I can always refer to my own work. It can help me getting a job in the future working for a [news]paper.*	Help getting a Job, Work, Future Employmen	Non-Financial Reward	
Anita: *For me, because of my profession [as a photographer]; to do something with personal branding.*	My profession, Personal Branding		
Jackie: *I recently uploaded 2 pictures for the first time; just to see how it is working … it was just fun to experience it.*	See how it works, Experimenting	Curiosity	Intrinsic-Selfish
Ali: *I like the idea. I was also trying new apps to use on my iPhone.*	Trying new apps, Experimenting		
Vasco: *If you see my [Facebook] page; you will see how much I like photography.*	Like photography	Enjoyment	
Daan: *It is really fun, it's exciting; every day I watch to see if there is a new task. And every new task is a surprise.*	Fun, Excitement, Surprise		
Earvin: *My name was published in the papers as proof for my work … Now [that] I know how nice it is to see my picture in the papers; I will [use Scoopshot even if it was for free].*	My Name Published, See my picture in papers, Fame	Publicity	Extrinsic-Social
Joost: *It is really hot to share things with others … it gives a kick to see your own picture in the papers or magazines.*	Hot to Share, See my picture in papers, Fame		
Cesar: *Everybody has the right to know the truth … As a citizen of the mother earth; it is everybody's responsibility to inform what's wrong and what is happening.*	Citizen of Mother Earth, Everyone's Right to Know, Obligation Towards Society	Altruism	Intrinsic-Social
Jari: *I think in this way: Why not help if I could? … I get good mind of doing that, even if I would do it for free … I believe in the phrase that if you are good to other people, they are good to you.*	Happy to Help, Good to Others, Reciprocity		

Understanding Continued Use of Crowdsourcing Systems: An Interpretive Study

Wael Soliman
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Appendix D: Identified Motivational Factors and Willingness to Participate for Free

Interviewee	Identified Motivational Factors						Intention to participate in Free Tasks?	
	Intrinsic			Extrinsic				
	Selfish		Social	Selfish		Social		
	Curiosity	Enjoyment	Altruism	Financial Reward	Non-Financial	Publicity	Yes	No
Ali	x	x		x		x	x	
Anita	x	x		x	x	x	x	
Anonymous			x	x			x	
Björn		x		x		x	x	
Cesar		x	x	x	x	x	x	
Daan	x	x		x		x	x	
Earvin	x	x		x	x	x	x	
Jackie	x	x	x	x		x	x	
Jari	x		x	x		x	x	
Joost	x	x	x	x	x	x	x	
Kaisa		x		x				x
Marco		x		x	x	x	x	
Max		x	x	x		x	x	
Peo				x	x			x
Vasco		x		x		x	x	

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Article IV

Soliman, Wael; Tuunainen, Virpi Kristiina (Unpublished): Understanding use discontinuance: Interpretive study of a volitional mixed system.

*Currently in review in an international research journal.

Understanding Use Discontinuance: Interpretive Study of a Volitional Mixed System

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Abstract

While understanding initial and continued use of different information systems has been a key focus in IS research, much less attention has been paid to IS discontinuance beyond the context of utilitarian systems. Yet, it is widely acknowledged that particularly more hedonic or mixed systems get eventually discarded by users. Hence, the purpose of this study is to describe and explain discontinuance, especially in the context of a volitionally used, mixed system. Based on our analysis, we identified two distinguishable groups of users that we label hobbyists and instrumentalists. We also found discontinuance to consist of two distinct stages of dormancy and quitting. The main difference between the two stages is whether or not a user has made the conscious decision to permanently abandon the system. We found that discontinuance can be explained by a number of interrelated factors including attention to alterative systems, dissatisfaction with the current offering, lack of feedback, lack of social connectedness, and decreasing perception of usefulness. The study contributes to theory by proposing a mid-range theory that explains user dissatisfaction and use discontinuance. It also contributes to practice by suggesting a number of recommendations for similar systems that should satisfy users' expectations and needs, thereby lowering the chances of abandonment.

Keywords: IS Discontinuance, Crowdsourcing, Mixed Systems, Interpretive Study

Introduction

Research examining information technology adoption and post-adoption behaviours is one the richest and most mature research streams in Information Systems (IS) (Jasperson et al., 2005). However, the vast majority of this body of research has conceptualized post-adoptive use of an IT application as an increasing, intensifying, continuing behaviour (Karahanna et al., 1999; Bhattacherjee, 2001b; Agrifoglio et al., 2012), when in reality "post-adoptive behaviours [...] may also diminish over time, as the various features of an IT application are resisted, treated with indifference, [or] used with a limited fashion" (Jasperson et al. 2005, p. 527), rendering discontinuance an integral component of the system's use lifecycle (Furneaux & Wade, 2011; Recker, 2014). Nevertheless, over the past 25 years only a very limited number of studies have paid considerable attention to phenomena related to ending the relationship with a focal technology, i.e., IS discontinuance (Cooper, 1991; Pollard, 2003; Furneaux & Wade, 2011; Turel, 2014). IS discontinuance, in this sense, can be seen as a decision made by users to quit the use of a system and not go back to it (Turel, 2014), or a decision to reject a system after it has previously been adopted either because of the dissatisfaction with its performance or in order to adopt a better one (Pollard, 2003).

Conventionally, IS research has classified IT artifacts, based on their intended purpose or "functional capacity" (Wu & Lu, 2013), into three categories: utilitarian, hedonic, and mixed (or dual/multi-purposed) systems (Wu & Lu, 2013; Gerow et al., 2013; Soliman & Tuunainen, 2015). The use of utilitarian systems (e.g. enterprise-class systems) is argued to be mainly driven by extrinsic motivational factors, for instance, perceived usefulness in terms of improving job performance (Davis, 1989; Karahanna et al., 1999). The use of hedonic systems (e.g. videogames) is argued in turn to be mainly driven by intrinsic motivational factors, like perceived enjoyment of spending time online or playing a game (van der Heijden, 2004; Lin & Bhattacherjee, 2010). The use of mixed systems' (i.e. applications that are both useful and entertaining), is argued to be driven by a mix of both intrinsic and extrinsic factors (Chesney, 2006; Gu et al., 2010; Agrifoglio et al., 2012; Soliman & Tuunainen, 2015).

Another dimension that adds to our understanding of the use phenomenon is the use-context, that is, the cognitive frame (Lindenberg 2001), or the level of volition vs. mandate by which a user perceives a particular IS (Turel, 2014). This framing has two very important implications. First, use behaviours with different IT applications belonging to the same IS type (e.g., utilitarian IS) could potentially have different antecedents and outcomes in different contexts. For example, contexts in which a new enterprise system (e.g. SAP modules) is imposed on employees in work context are not expected to be generalizable to non-work contexts in which users choose to adopt and use a freely available cloud-based tool

(e.g. Dropbox). Second, this also means that use behaviours of the same IT application (e.g., Twitter) could be explained differently depending on the users' cognitive frame or use-contexts. For example, Agrifoglio et al. (2012) found that users who used Twitter for work purposes, were predominantly driven by extrinsic motivational factors, while users who used it for leisure purposes were predominantly driven by intrinsic motivational factors.

The absence of the use-context dimension may explain the somewhat contradicting findings of two meta-analyses studies investigating the impact of IS type (utilitarian vs. hedonic vs. mixed) on the core set of motivational factors driving their use (Wu & Lu, 2013; Gerow et al., 2013). Wu and Lu (2013) concluded that extrinsic motivations were the key predictors of utilitarian IS use, and intrinsic motivations were more critical in both hedonic and mixed IS. In turn, Gerow and colleagues (2013) concluded that the hedonic nature of IS was not a boundary condition for studying IS use, and that intrinsic motivation was central to understanding the three IS types. However, neither of the IS classifications used in the analyses did take into account the users' dominant cognitive frame (e.g., their perception of volition) guiding their use experience.

Earlier research on IS discontinuance has been dominated by attention to utilitarian systems, particularly in the work context (Cooper, 1991; Pollard, 2003; Lee, 2010; Furneaux & Wade, 2011). While research on IS discontinuance beyond utilitarian systems is scarce (Turel 2014 is one exception); contexts of volitionally used mixed IS, such as crowdsourcing systems, have been entirely overlooked. There are two plausible reasons to why use discontinuance is so rarely discussed in IS literature, while adoption and continuance studies are abundant. In the context of empirical research, it is likely that users would not be easily motivated to participate in a study regarding a technology they had already decided to abandon (see e.g., Soliman & Tuunainen 2015). Methodologically, on the other hand, quantitative, cross-sectional studies – the dominant approach in IS use-related questions – typically operationalize continuance intention in terms of participants' response to how strongly they agree or disagree with statement of future use intention (see e.g., Karahanna et al. 1999; Bhattacherjee 2001a; Bhattacherjee 2001b; Hong et al. 2008). This methodological choice would always lead to trivialization of discontinuance as being the lowest level of continuance intention, or at best, as the extent to which respondents report their future discontinuance intention (e.g., Furneaux & Wade 2011). Hence, we believe that we can gain invaluable knowledge on discontinuance by allowing discontinuing users to reflect on their past decisions; to give them a chance to reconstruct their experience based on how they lived it. In doing so, not only do we gain a rich understanding of the competing meanings of discontinuance, but also we would be able to improve our understanding of systems' continued use as well.

With this backdrop, the aim of this article is twofold. First, we aim to uncover how discontinuance unfolds in the context of volitional/mixed IS, such as crowdsourcing systems. Second, "as a final product of the research" (Walsham, 1995), we aim to develop a mid-range theory (Gregor, 2006), or conceptual model, that explains use-discontinuance. To this end, the article is organized as follows. In the following section, a literature review is presented covering the topics of crowdsourcing and IS discontinuance. In section 3, the empirical context, and theoretical foundation governing the data collection and analysis are discussed in fair detail. Then, in sections 4 and 5, the key findings are presented and discussed, respectively. Section 6 is dedicated to presenting study's limitations and contributions, and section 7 presents the concluding remarks.

Prior research

IS discontinuance

In the extant IS literature continuance refers to the usage behaviour beyond the initial use and acceptance phase. IS discontinuance, on the other hand, is described as a decision to reject a system after it has previously been adopted either because of the dissatisfaction with its performance or in order to adopt a better one (Pollard, 2003). Review of existing research points to two broad conceptualizations of IS discontinuance. The first approach implies that use continuance and discontinuance are two opposite extremes of a unidimensional continuum (e.g., Bhattacherjee 2001b; Lee 2010). Turel (2014) notes that this approach assumes that continuance and discontinuance share the same predictors, and that low levels of continuance intentions are considered equivalent to high levels of discontinuance intentions. The alternative approach suggests that discontinuance is a more complex phenomenon, and that continuance and discontinuance decisions need to be regarded as two theoretically and conceptually distinctive issues that can co-exist, with potentially different antecedents and outcomes (Pollard, 2003; Turel, 2014).

Taking into account both the widely accepted IS types classification (utilitarian and hedonic) and the use context (mandated and volitional), we can classify the prior research on IS discontinuances into six different categories targeting specific IS types (see Table 1).

	Context (level of volition)	
	Work context (low volition)	Non-work context (high volition)
Utilitarian IS	**(Type-1) Mandated use of enterprise systems.** Discontinuance research is *dominated* by this IS type. Studies in contexts of e.g. office automation systems (Cooper, 1991); group support systems (Pollard, 2003); e-learning tools (Lee, 2010); and enterprise systems (Furneaux & Wade, 2011).	**(Type-2) Volitionally used utilitarian systems.** Discontinuance research in this area is *rather limited*. Studies in contexts of e.g. switching between ISPs (Spiller et al., 2007); switching between web browsers (Bhattacherjee et al., 2012); and switching between file sharing tools (Polites & Karahanna, 2012).
Hedonic IS	**(Type-3) Mandated use of gamified utilitarian systems.** Discontinuance research in this area is *lacking*. Example of an IS in this class: Microsoft's Ribbon Hero game (www.ribbonhero.com).	**(Type-4) Volitionally used hedonic systems.** Discontinuance research in this area is *very limited*. One study on discontinuance of the hedonic use of Facebook (Turel, 2014).
Mixed IS	**(Type-5) Mandated use of systems that are both hedonic and utilitarian.** Discontinuance research in this area is *lacking*. Example of an IS in this class: Yammer (www.yammer.com).	**(Type-6) Volitionally used systems that are both hedonic and utilitarian.** Discontinuance research in this area *lacking*. *The focus of the current study*.

As depicted in Table 1, research on utilitarian IS discontinuance in work context (Type-1: utilitarian/mandated) has received the largest share of attention. In such contexts, discontinuance is conceptualized as the decision that is made to stop using an IT application in support of a work task (Recker, 2014). From that perspective, Furneaux and Wade (2011) observed three types of discontinuance: abandonment, when the use of a system is halted without introducing a replacement; upgrade, which varies from small-scale maintenance projects to large-scale initiatives, and; replacement by an alternative. Replacement has been found to be the most recurring type of discontinuance, with the focal system's shortcomings, support availability, and technical integration with other systems as the three most salient factors impacting IS replacement intentions (Furneaux & Wade, 2011). In a similar vein, in a study examining the use of a group support system in organizational context, Pollard (2003) suggests that IS discontinuance is a "multidimensional state" consisting of stalling and rejection stages. Stalling describes users who temporarily stop using the system with a probability of using it again; and rejection describes users who decided to reject the system permanently. System's unreliability was found to be one of the strongest reasons for use

discontinuance decision. Most interestingly, however, all respondents in the study expressed strong intentions to use the system in the future, regardless of whether they had actually continued or discontinued their use. Such finding calls into question the suitability of discontinuance intentions as a proxy for understanding actual discontinuance behaviour.

Research on utilitarian IS discontinuance in non-work context (Type-2: utilitarian/volitional) is rather limited. The few studies conducted in this domain show users having full autonomy over their behaviour, and that the systems' use (and discontinuance) decisions are completely volitional. Most research in this area has focused on users' switching intentions – that is, users' intentions to discontinue using a focal system or service in order to use a better alternative (e.g., Spiller et al. 2007; Polites & Karahanna 2012; Bhattacherjee et al. 2012). For example, Bhattacherjee et al. (2012) found that users' intentions to switch from one web browser to a new one were influenced by an interplay between the positive impact of users' perceptions of the new system's relative advantage on one hand, and the negative impact of users' satisfaction with the incumbent one on the other; while actual switching behaviour was significantly influenced by users' level of habituated use of the incumbent system.

Also research on discontinuance of hedonic IS in non-work context (Type-4: hedonic/volitional) is very limited; only a single study was found (Turel, 2014). Unlike research on types 1 (utilitarian/mandated) and 2 (utilitarian/volitional), Turel (2014) focuses on discontinuance intentions of addictive hedonic systems, and the negative feelings of guilt that are associated with such unproductive use patterns. The key findings of this study suggest that users' discontinuance intentions are driven by the users' feelings of guilt together with their confidence on being able to quit. These drives, however, are counterbalanced by the level of habit (i.e., addiction) together with the satisfaction with the system.

Volitional, mixed crowdsourcing systems

While crowdsourcing as a research topic has become increasingly popular (Howe 2006; Leimeister et al. 2009; Antikainen et al. 2010; Schenk & Guittard 2011; Feller et al. 2012; Majchrzak & Malhotra 2013; Schlagwein & Bjørn-Andersen 2014), discontinuance of such volitional mixed systems has been entirely unexamined in previous research. By definition, crowdsourcing is a type of participative online activity in which a firm proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task (Estellés-Arolas & González-Ladrón-de-Guevara, 2012). As such, crowdsourcing systems represent a class of IT/IS artifact, whereby *seekers* (usually firms seeking solutions and/or ideas to specific challenges) and *solvers* (potentially anyone in the crowd) are in the voluntary trade of solutions-for-rewards over an electronic communication platform, usually a volitionally used and publicly available online service.

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IS research on individual-level crowdsourcing motivation strongly suggests that most crowdsourcing systems are mixed systems. Consistently, the research has shown that users are driven by a mix of both intrinsic and extrinsic motivational factors (see Table 2).

Table 2. Users' motivation to participate in crowdsourcing systems

Intrinsic factors	Extrinsic factors
• Fun / enjoyment / entertainment (Brabham, 2008; Antikainen et al., 2010; Zheng et al., 2011; Väätäjä, 2012; Soliman & Tuunainen, 2015) • Creativity / creative challenge of the contest / collective creativity (Brabham, 2008; Ebner et al., 2009; Antikainen et al., 2010) • Altruism / helping others / informing others (Väätäjä, 2012; Soliman & Tuunainen, 2015)	• Direct compensation / financial reward / monetary incentive (Brabham, 2008; Ebner et al., 2009; Leimeister et al., 2009; Antikainen et al., 2010; Väätäjä, 2012; Soliman & Tuunainen, 2015) • Develop personal skills / get training / learning something new (Brabham, 2008; Ebner et al., 2009; Leimeister et al., 2009; Antikainen et al., 2010; Soliman & Tuunainen, 2015) • Self-marketing / fame / publicity / acknowledgement by others (Leimeister et al., 2009; Zheng et al., 2011; Soliman & Tuunainen, 2015)

It has also been suggested that in the context of crowdsourcing systems, the motivational factors responsible for initial use are different from those responsible for continued use (Soliman & Tuunainen, 2015). However, to our best knowledge, no studies have looked at what happens beyond continued use. Specifically, when, how and why do crowd-solvers end their relationship with a crowdsourcing system?

Research approach

This study is the second phase of a longitudinal research project examining the key determinants of the use lifecycle of a volitional mixed crowdsourcing system. Whereas findings regarding the factors responsible for initial and continued use have been reported in detail in earlier work (*reference to be added*), the current study has been concerned with post-continuance behaviour. Since our study is the first research endeavour examining discontinuance in the described IS class, we needed to gain an in-depth understanding of a representative technological artifact, the various contexts in which it was used, as well as how the users made sense of them and of the factors influencing their use behaviour. It is well established that qualitative, interpretive approaches are most relevant for studies of such nature and objective (e.g., Walsham & Sahay 1999; Schlagwein & Bjørn-andersen 2014; Leclercq-Vandelannoitte et al. 2014). Qualitative research is best described as a process that is designed at the same time it is being done; is open to unanticipated events, as it offers

holistic depictions of realities that cannot be reduced to a few variables (Gephardt, 2004). The remainder of this section offers a detailed account of the study context, and the rationale behind our theoretical and methodological choices.

Research context

The IS artifact under study is a crowdsourcing platform and mobile application called Scoopshot (www.scoopshot.com). The Scoopshot platform has been developed and run by P2S Media Group Inc., which was founded in April 2010 by a Finnish team, and is currently based in the centre of Finland's capital, Helsinki. Scoopshot – currently available for Apple, Android and Windows phones – has been installed by over 500,000 users across 177 countries. Scoopshot is a crowdsourcing platform that facilitates and manages the trade of crowdsourced mobile user generated content (e.g., photos and videos), connecting media agencies (the seekers) with the crowd photographers (the solvers), with a revenue model based on a commission on each photo sale. The crowd photographers, or Scoopshooters, have complete volition to participate either by responding to a pre-set task by a seeker, or by submitting content that they believe publishing-worthy. The submitter may get compensated if the photo is chosen to be purchased by a seeker. Sold photos are typically used for publishing purposes in different visual media (e.g., TV, newspapers, online, etc.). Scoopshot's President and Chief Operations Officer reports that "all in all, almost £300,000 has been paid to Scoopshooters worldwide" (Journalism.co.uk, 2014). The company's CEO sums up how Scoopshot works: *"Media can send targeted tasks to the Scoopshooters anywhere in the world. In other words, I select a region and I direct and send a push notification to all the Scoopshooters in that region asking them to take photographs of an event. At the same time I tell them how much I'm willing to reward them for that photo"* (Salz 2012).

One the most intriguing aspects of Scoopshot as a research setting is that in the duration of this study, the platform has been run as a photography brokerage marketplace, without offering any within-community communication capabilities (e.g., voting, following, commenting, etc.). As such, Scoopshot serves as a prime example of what has been referred to as non-community type of crowdsourcing platforms, where solvers do not necessarily form a networked community, but rather use a shared platform to solve a particular task or tasks (Doan et al., 2011). Scoopshot's management emphasizes that their niche should not be confused with social media. During an interview, the COO described the rationale of Scoopshot: *"we are not doing social media; we are helping media to become social"*. In other words, they do not perceive themselves to be competing with other photo-based social media platforms, such as Flickr and Instagram. Instead, they envision Scoopshot offering a unique

opportunity for media organizations to utilize the crowd as a constant source of fresh content, and for the crowd to be compensated for their efforts. The CEO elaborated on this point: *"To me the dilemma is that social means stuff. If you go social, people start sending photos of their favourite decoration, their cat, hairstyle, umm, their best friend, and all that kind of stuff. That to me is social; but that is not news. So, [the dilemma is] how do we leverage social - meaning awareness, excitement and action - but maintain the content value of what we can provide?"*

It can also be noted that in its early days, Scoopshot's incentive program was heavily reward-oriented, and was frequently advertised using the slogan "*Snap a Photo and Earn Money*".

Theory

We turn to the expectation-disconfirmation theory (EDT) for a lens to better understand IS discontinuance on the individual level of analysis. The fundamental assumption of EDT is that customer (user) satisfaction is the key determinant of product or service repurchase or reuse intention, while dissatisfaction is argued to determine discontinuance intention and/or complaining behaviour (Oliver, 1980; Oliver & DeSarbo, 1988; Bhattacherjee, 2001b; Venkatesh & Goyal, 2010). Rooted in marketing and consumer behaviour research, expectancy disconfirmation operates in two successive processes: a process for creating expectations, followed by a process of disconfirming those expectations by comparing them with first-hand experience (Oliver, 1977; Oliver, 1980). The judgment that arises from this comparison is considered negative disconfirmation if the product or service is worse than expected, positive disconfirmation if it is better than expected, and simple confirmation if it is as expected (Oliver & DeSarbo, 1988). Positive disconfirmation enhances satisfaction, negative disconfirmation decreases it, while simple confirmation has little effect on satisfaction (Oliver et al., 1994). EDT also posits that the comparison between expectations and actual outcome may be calculated objectively in early stages of the process, while in later stages it may be interpreted more subjectively. The latter subjective comparison is deemed the principal determinant of satisfaction or dissatisfaction (Oliver et al. 1994). Satisfaction in this sense is conceptualized as an affective response to the disconfirmation process.

EDT has been utilized in IS research to explain continuance intention in specific IS use contexts, such as, e-commerce (Bhattacherjee, 2001a), online banking (Bhattacherjee, 2001b), and e-learning (Lee, 2010). Consistently, satisfaction with IS has turned out to be the strongest predictor of users' continuance intention. Simply put, EDT argues that the discrepancy between what a user expects of an IS and what he or she gets in reality determines future use, where "the *delight* of a positive disconfirmation enhances a satisfaction judgment, while the *disappointment* of a negative disconfirmation decreases it" (Oliver &

DeSarbo 1988, p. 496, emphasis added). Hence, IS discontinuance is theorized to be a result a subjective feeling of dissatisfaction resulting from negatively disconfirmed expectations.

The initial data collection of the study reported in this paper was informed by the theoretical implications of EDT. However, we used it with caution and made a conscious decision to be open for alternative and/or complementary explanations along the way (Walsham, 1995). While EDT played a major role in developing the initial stage of the research project, during data analysis it became apparent that self-determination theory (Ryan & Deci, 2000b; Deci et al., 1999; Brief & Aldag, 1977) would provide the needed supporting role. Self-determination theory (SDT) represents a broad framework for the study of human motivation and its impact on behaviour. One of the widely accepted assumptions of the theory is its portrayal of the *processes of attribution* (Lindenberg, 2001). These processes suggest that situational aspects determine whether an individual attributes his or her own action to an internal (i.e., intrinsic), or external (i.e., extrinsic) cause (i.e., locus of causality). Intrinsic motivation is defined as the doing of an activity for its inherent satisfaction rather than some separable consequence, while extrinsic motivation describes doing something in order to attain some separable outcome (Ryan & Deci, 2000a; Deci et al., 1999; Ryan & Deci, 2000b). This distinction between extrinsic and intrinsic motivations has provided a theoretical lens through which most IS research has divided systems into utilitarian, hedonic, or mixed systems.

When a person behaves a certain way because of an authentic interest (i.e., intrinsically motivated), in contrast to acting because of reasons external to the self (i.e., extrinsically motivated), this behaviour has a strong and positive impact on their sense of confidence, enhanced performance, persistence, creativity and general well-being (Ryan and Deci, 2000b). However, underlying intrinsic motivations are the psychological needs for autonomy, competence and relatedness that must be satisfied (Deci et al., 1999; Deci & Ryan, 2000). First, the need for autonomy suggests that people must feel a sense of choice and self-directedness if intrinsic motivation to be maintained or enhanced. Next, the need for competence suggests that structures that conduce toward feelings of self-efficacy (e.g., rewards and positive feedback) can enhance intrinsic motivation because they allow satisfaction of the basic psychological need for competence. Finally, the need for relatedness suggests that people have an innate tendency towards social integration, which reflects humans' need for relatedness, a desire to feel connected to others, to love and be loved, and to care and be cared for (Deci & Ryan, 2000; Ryan & Deci, 2000a). The main argument is that environments that permit the satisfaction of these needs tend to increase intrinsic motivation; whereas those that forestall their satisfaction tend to decrease intrinsic motivation.

Data collection and analysis

Our data repository is composed of both primary data and secondary data. Our primary data consists of semi-structured face-to-face and computer-mediated interviews. Additionally, to enhance our understanding of the user experience, the first author has been a registered user of the service since 2011. He has participated in a number of the announced photography tasks, and has been following the service development also from a user's viewpoint. Our secondary data included press reviews and online materials concerning Scoopshot.

In qualitative IS research, the interview is the most common technique of qualitative data collection (Beaulieu et al., 2013), and when utilized to its full potential, it is considered one of the most powerful data gathering tools (Myers & Newman, 2007). Our primary data corpus relies on interviews conducted with twenty informants: two Scoopshot top management members, and eighteen Scoopshot users (Scoopshooters). The 18 Scoopshooters included 15 males and 3 females, of ages ranging between 17 and 46 years, and with different educational and professional backgrounds. The first round of interviews took place between April 2012 and May 2013, and the second interview round was conducted between May 2014 and December 2014. Of the eighteen Scoopshooters, ten have participated in both interview rounds; while five had participated in the first interview round only and three in the second interview round only. A detailed account of interviewees' demographics and interviewing rounds is provided in Appendix 1.

Considering the dispersed geographic locations of the Scoopshooters, a computer-mediated communication (CMC) strategy was chosen for our interviews with those who agreed to participate in the study. The use of synchronous CMC enabled the freedom of choice for the interviewees as to the time and place they preferred and felt most comfortable with, as well as the communication channel (Brabham, 2010; Kazmer & Xie, 2008). While the main interview core themes remained the same for all interviews; depending on the flow of the conversation, some questions were added or omitted, and the exact wording and order of some questions differed from one interview to another. Myers and Newman (2007) argue that qualitative interviews are best described as a drama where actors (i.e., the interviewer and the interviewee) perform on a stage (i.e., study context) using a script (e.g., interview protocol). While the script should have minimal elements (e.g., opening, core questions and closing); "the qualitative interviewer should always use an incomplete script" to facilitate openness, flexibility and improvisation (ibid., p. 14). Consistent with these guidelines, our interview script was planned and performed – an exemplary interview protocol is provided in Appendix 2.

The qualitative analysis approach adopted here rests on an abductive logic, rendering both deductive and inductive principles usable (Leclercq-Vandelannoitte et al., 2014). Abductive logic calls for a stronger reliance on theory than is suggested by true induction, yet, distances itself from true deduction (Dubois & Gadde, 2002). Specifically, we identified deductively a priori set of themes informed by the EDT, but we also remained open for new themes to (inductively) emerge from the data. Mingers (2004) explains that based on the abductive logic "we take some unexplained phenomenon and propose hypothetical mechanisms that, if they existed, would generate or cause that which is to be explained ... This [however] does not of itself prove that the mechanism exists, and we may have competing explanations, so the next step is to work towards eliminating some explanations and supporting others" (pp. 94-95). This logic is in congruence with the complementarity of knowledge inquiry as portrayed by Lee's (1991) integrative framework of the three types of understanding: subjective-, interpretive-, and positivist-understanding. This study occupies the link between the subjective and interpretive understandings.

Thematic analysis is the method of our choice, with the general aim of systematically identifying, analysing and reporting patterns (i.e., themes) in a corpus of data (Fereday & Muir-Cochrane, 2006; Braun & Clarke, 2006). Thematic analysis is commonly described as an analysis technique that involves the cyclic iteration between six phases: (1) familiarizing oneself with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) refining themes and overall story; and finally (6) producing the report (Braun & Clarke, 2006). As such, careful reading and re-reading of the data was followed by initial coding, which involved assigning codes (or labels) to quotes considered relevant to the study context. A line-by-line coding process was performed where both *theory-driven* codes as well as *data-driven* codes were used. "Dissatisfaction", for instance, was considered a theoretical code informed by EDT to reflect a negative affective response an unmet expectation. "Lack of Connectedness", on the other hand, was a data-driven code that emerged from the data to reflect instances in which participants expressed their frustration with their inability to connect with peers through Scoopshot. Then, codes were collated to generate the key themes and relationships among them. Finally, core themes explaining the research phenomenon were identified, and trivial themes were eliminated from the final analysis. The importance of elimination (i.e., selective coding) rests on its role in allowing the researcher to saturate the selected themes, while avoiding the inclusion of diverse additional material that has no relevance to the core investigation (Holton, 2007). The end-result of our analysis process is a set of key findings that we present and discuss in the following sections.

Findings

In this section, we report our findings in terms of four interrelated subsections: users' profiles, stages of discontinuance, sources of dissatisfaction, and attention to alternatives.

Users' profiles

While Scoopshooters' use behaviour has been driven by a mix of both selfish and social motivational factors (*reference to be added*), we were able to distinguish between two distinct user profiles based on the dominant motivational/cognitive frame (Lindenberg, 2001); we label these two groups hobbyists and instrumentalists (see Figure 1). These profiles imply neither positive nor negative connotations; they are merely labels that we find best describe the users' perceptions of the system, and the dominant expectations these perceptions entail. This classification is determined by the key factors motivating the participants to use Scoopshot, and/or the salient factors responsible for their dissatisfaction. Appendix 3 illustrates the classification procedure and supporting data.

Hobbyists in our sample are those primarily motivated by Scoopshot's hedonic value; they enjoy photography for its own sake, and do not attach as much value to the financial reward as they do with their expectations of social networking (e.g., sharing, commenting, connecting, etc.). To hobbyists, social networking was the most valued, yet the most missed feature in Scoopshot. Of the eighteen participants, eleven exemplify this profile. Instrumentalists, on the other hand, are those mostly driven by the service's instrumental/utilitarian value; they are motivated by the financial reward and/or utilizing the platform as a marketing channel for their content. Six participants fit the description of this profile. The interviews suggest that instrumentalists' participation is contingent on their perception of the probability of their photos being sold – that is, the stronger the belief that a photo will be sold; the higher the probability of them submitting one. Interestingly, they do not attach as much value to the hedonic aspects of Scoopshot as they do with its utility.

While these two profiles of hobbyists and instrumentalists reflect the dominating cognitive frames for appropriating Scoopshot, it does not mean that either profile is driven by a pure set of motivational factors. In any situation, a multitude of (conflicting and/or compatible) goals are competing over our limited cognitive resources (e.g., attention and memory) (Lindenberg, 2001). The most dominant goal strongly influences our cognitive frame according to which we make sense of situations around us (e.g., perceiving a certain task as being utilitarian vs. hedonic). More importantly, however, the less dominant goals are not discarded. Rather, they remain active in the background and, depending on their strength and compatibility with the main goal, weaken or strengthen the impact of the cognitive frame. While the classification

we propose only reflects the dominant factors, we acknowledge that the observed user behaviour results from the interplay between the various motivational factors.

Following this understanding, we find that while hobbyists' main frame is posited to be hedonic in nature, they still can value winning a prize, as an added bonus – rather than as a main goal. One of our respondents, Björn, for instance, is categorized as "hobbyist" because he outlined his affection to, and enjoyment of, shooting and sharing photos as his main driver to use Scoopshot. Such cognitive framing does not mean that the possibility to sell his photos has no influence on him at all: "*As an amateur photographer ... I really enjoy shooting and also sharing ... I'd be quite thrilled showing a photo in a newspaper, and if I get paid for it, it's a bonus*".

Similarly, even though instrumentalists' main cognitive frame is utilitarian in nature, it does not mean that they would not enjoy an exciting use experience. Another respondent, Earvin, for instance, is categorized as "instrumentalist" because for him the main driver to use Scoopshot was career related. As a journalism student, his main objective was to create a photography and news portfolio that could help him get a job as a journalist in the future. This objective, however, did not prevent him from expressing that participation was filled with excitement and "*it felt really nice to take place next to the press*".

Stages of discontinuance

Surprisingly, all thirteen Scoopshooters who participated in the second interview round had stopped using Scoopshot for varying periods of times. Figure 1 illustrates a time map that captures the participants' use lifecycle tracking their initial use (marked in diagonal lines), active use (marked in grey), and use discontinuance. The analysis reveals that discontinuance is not a single discrete event, but rather a process that takes shape over time, starting with dormancy (marked in vertical lines) and ending with quitting (marked in black). From a system-user relationship perspective, the main difference between dormancy and quitting is whether or not users have made the conscious decision of removing the application from their mobile phones. The removal marks the transition from undetermined dormancy to final quitting.
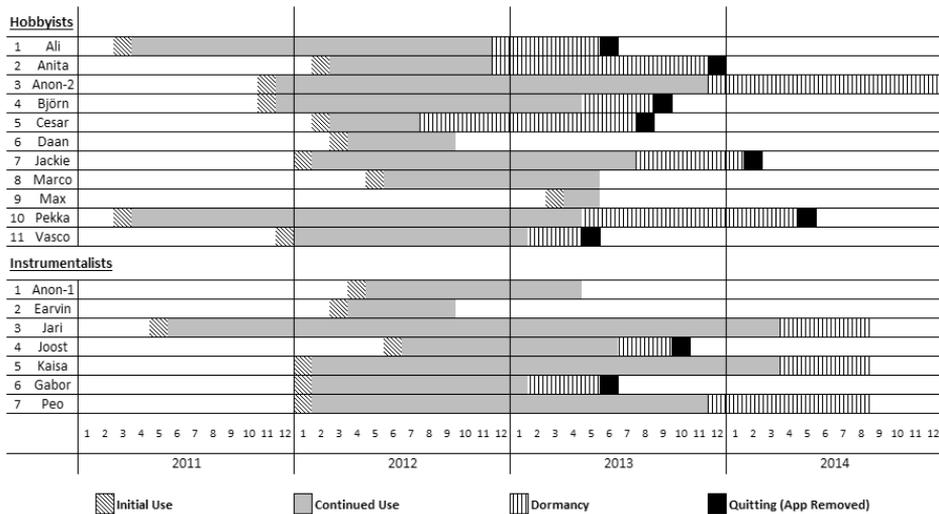
Figure 1 Time map illustrating the use lifecycle of users in the two groups

Dormancy marks the first stage of discontinuance, and represents the period during which users start losing interest to actively use Scoopshot. During dormancy, users are not motivated enough to use Scoopshot; yet not dissatisfied enough to remove it from their devices. Interestingly, we found that this stage is experienced differently for instrumentalists and hobbyists. For instrumentalists, dormancy is a stage characterized by dissatisfaction with the system's perceived utility. For instance, Jari, Kaisa and Peo have stopped using Scoopshot, but have not removed the app from their mobile devices. For instance, Peo explains that even though he prioritizes other alternative routes to selling his photos, he is keeping Scoopshot installed because it *"could come in handy"*. He elaborates: *"If I end up [with] something of worldwide interest, Scoopshot could help me spread my work fast and to a huge amount of customers. For the day to day things I have contract with all of the local news media, and I deliver photos directly to them"*.

While dormancy seems to be a planned behaviour for instrumentalists, for hobbyists, dormancy appears to be more unconscious and unplanned. For instance, Jackie explains that she could not remember the exact moment when she stopped using Scoopshot *"it just happened … the novelty was gone, I guess. It ended on page 6 on my Phone; just faded awayyyyy"*. The final decision to quit and remove the app followed a realization that, *"after a while I didn't use it too much … so I had to make decisions which apps to delete and chose the one[s] I didn't use"*.

Quitting represents the final stage of discontinuance where a user makes a conscious decision to end the relationship with the system. Our respondents reported having removed Scoopshot

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app for three different reasons: 1) When migrating from an old device to a newer one, with no interest in re-installing the app (as reported by Anita and Vasco); 2) When the system recommends removing unused applications (as reported by Björn); or 3) When the user wants to improve the device performance by freeing some memory through removing unused apps (as reported by Jackie). While these three reasons describe the final decision to remove the app, further discussions with the interviewees revealed deeper explanations to what lead to the users' dissatisfaction with the system and consequent dormancy that preceded quitting.

Sources of dissatisfaction

Since all of our respondents in the second interview round had discontinued the use of the Scoopshot platform, we wanted to better understand what were the unmet expectations and what Scoopshot might have done differently to keep the users interested in the service. Our data and analysis points to three salient reasons: disappointing utility, lack of feedback, and lack of connectedness. While disappointing utility was most relevant to instrumentalists; both lack of feedback and lack of connected were most prevalent amongst hobbyists.

1   Disappointing utility

The theme of disappointing utility emerged as the major source of dissatisfaction for instrumentalist users in particular, and it reflects an unmet expectation (i.e., negatively disconfirmed) about the system's utilitarian value (e.g., perceived usefulness). It is important to note that the system's utility is a subjective belief, and as such, perceived differently by different users, depending on what utility they expect from the system. To Jari and Kaisa, Scoopshot was only as useful as its ability to provide sellable photography tasks. Jari, for instance, thinks that *"things have gotten worse with this app [Scoopshot]... First, I thought this is [an] easy way to gain some extra income and there was [/were] lots of missions. But for the last year, missions have mostly been weird and there hasn't been so many of them."*

Likewise, Joost's participation was predominantly utility-driven, although different in nature. He viewed Scoopshot as a marketing channel where he could place free adverts about his own and his family's business. For him Scoopshot's usefulness was determined by its ability to get his articles and photographs viewed by the public. Even though he had earlier sold some Scoopshot photos, this did not prevent him from quitting Scoopshot to use an alternative, despite the fact that this alternative did not offer him any financial incentive.

2   Lack of feedback

The lack of feedback theme emerged as the second major source of dissatisfaction for hobbyist users in particular, and it reflects an unmet expectation about receiving evaluative

feedback on one's contributions. When Ali was asked to explain why he eventually stopped using Scoopshot despite the fact that some of his photos were sold, he explained: *"It was interesting in the beginning as a hobby. I also sold a few photos there. But then, it started getting boring, because there was nothing in return even though one submitted many photos ... I don't mean only payments, but no comment, no feedback, nothing. One way communication doesn't work as you know :) ... The whole thing is like they are taking advantage of the users, but giving nothing back. Of course some users get paid for their work, but still ... I guess most people who are using the service are somewhat interested in photography. So, even a feedback system would do something positive".*

Björn echoes Ali's disappointment: *"I first got hooked by the idea that I might be able to get some of my pics published through the app. I take a lot of photos, both "mobile" and real camera photos. As a hobby-photographer, I of course like [it] when people notice my photos, and even comment on them, as most photographers probably do ... I basically got bored of it, since nothing got back to me ... If you, let's say, are a writer, and you keep writing and sending your articles to a magazine, paper or others, and nothing ever happened with it, you would probably get bored too, right?"* Disillusioned with Scoopshot, Jackie sums up her feelings: *"It [Scoopshot] had no feedback, like my pics were sent in the big black nothing. So at one point, I thought: why bother?"*

3   Lack of connectedness

The lack for connectedness theme emerged as the third source of dissatisfaction for hobbyists (but not for instrumentalists) from the respondents' statements related to the need for social interaction, need for sharing, missing comments, and the need to have friends. For instance, Anita, reflecting on her dissatisfaction with Scoopshot, says: *"When I think of making pictures of a newsworthy thing, I first think of Instagram, not Scoopshot. There, I did get replies on Facebook by my friends, got to share it on Twitter by my followers. That fulfilled my need to share and get replies. It's like a need to get feedback, or..., looking for the word, acceptance. That what I like, other people also like."*

Interestingly, hobbyist users seem to value social networking higher than the financial reward. Ali, for instance, thought that social networking was far more valuable to him to support long term participation than financial reward: *"Think of Instagram. They have no payment, only social interaction. People like your photo; they comment how good/bad it is; they ask you information about the location, etc. If one sees that followers are interested in his work and he's getting comments, he will get addicted."*

Equally interesting, our data implies that instrumentalist users did not attach much value to any potential social networking features on Scoopshot. For instance, when Jari and Kaisa

were asked explicitly about social networking features, such as connecting with friends on Scoopshot, they thought that such a feature would make no difference neither to their perception of, nor participation in Scoopshot.

Attention to alternatives

The theme of attention to alternatives represents instances in which our interviewees initiated a discussion regarding their experiences with services other than the focal system of Scoopshot. We did not ask our respondents specifically about their attentiveness to alternative services; rather, the questions were intended to elicit information about dissatisfaction with Scoopshot and possible reasons why they had stopped using it. That is when most interviewees pointed out that what they missed in Scoopshot, they found in other services. Attention to alternatives seems to be a critical condition for users to make the transition from the dormancy stage to the quitting stage. For instance, when Anita was asked to explain how her expectations compared with reality and what might the reasons for quitting the use of Scoopshot be, she explained: *"Before, I thought that I could be a photographer 'on the fly' with my pictures in the news (online, offline I didn't know). But I never got any responses [from Scoopshot], and got a tip by a friend that Instagram existed. I installed that, found out what Instagram had to offer and put that on my first-to-use-app-list (not that this actually exists, but when I think of making pictures of a newsworthy thing, I first think of Instagram, not Scoopshot). And there I got replies on Facebook by my friends, got to share it on Twitter by my followers. That fulfilled my need to share and get replies."*

While Anita represents a hobbyist user who perceived Instagram (a photo sharing service) as an alternative to Scoopshot; we found that attention to alternatives played a similar role for instrumentalist users, as well. Joost, for example, explains why he stopped using Scoopshot and started using another service: *"More newspapers do have an app to connect with them, like the app ED.nl [Eindhovens Dagblad]. For example, [next] Monday there will be a journalist at our company because I sent them something actual in hope that the article would be published in the newspaper of our region. So I stopped using Scoopshot to use something the same, but more for newspapers in our region. And I guess I like to send more serious things than mostly funny tasks of Scoopshot, like, 'today it's getting warm: send your BBQ photo?!'"*

The data suggests that the users constantly compared between the focal system (i.e., Scoopshot) and the availability of alternatives in their environment (e.g., ED.nl and Instagram, etc.), and more often than not, the decision to quit Scoopshot coincided with a period of experimenting with other alternatives. For example Pekka, who had used Scoopshot for nearly a year before discontinuing, explains: *"Well, for a while it was something nice to*

do with my spouse. We drove around places [pursuing photo-tasks] ... it was fun. But I think that if there would have been some other app, maybe like Instagram to compare for [/with], maybe I would have been less interested about Scoopshot for [these] 12 months."

When he was asked whether he would be still using Scoopshot had Instagram not existed, he answered: *"Absolutely. Those two are so closely doing same things as a picture application. Most differences are that you don't sell pictures at Instagram and you can't [receive] feedback/social networking at Scoopshot. Apart from those things those two apps are pretty much [the] same thing."*

Discussion

The process by which use-discontinuance took place for the users in our study is theoretically compatible with the expectation disconfirmation theory (Oliver, 1977; Oliver, 1980). Specifically, our findings echo two major tenets of the expectation-disconfirmation theory: 1) dissatisfaction is a key driver of discontinuance; and 2) disappointing utility (i.e., negative disconfirmation) is a key determinant of dissatisfaction (for instrumentalist users). However, EDT provides only a partial understanding of our findings. First, the EDT paradigm treats discontinuance as an unproblematic construct characterized only as the opposite of use continuance, and, as such, does not help in explaining the temporal and conceptual differences underlying behaviour and the stages of the discontinuance process – the stages of dormancy and quitting in our case. Second, EDT focuses mainly on the cognitive comparison that happens between pre-exposure expectations and post-exposure system performance, neglecting the impact of comparisons made between the focal system and alternatives available to the user. We find users' attention to alternative systems to play a significant role in amplifying the impact of dissatisfaction on discontinuance. Third, EDT focuses mainly on the system's instrumental value captured in terms of perceived usefulness (Bhattacherjee, 2001a; Bhattacherjee, 2001b), and does not provide a sufficient explanation for sources of dissatisfaction (and discontinuance) for users with different cognitive frames. Hence, we propose a conceptual model of use discontinuance of volitional mixed systems (Figure 2) that accounts for these overlooked issues. The proposed model as a whole, as well as its building blocks, is discussed in the following two subsections.
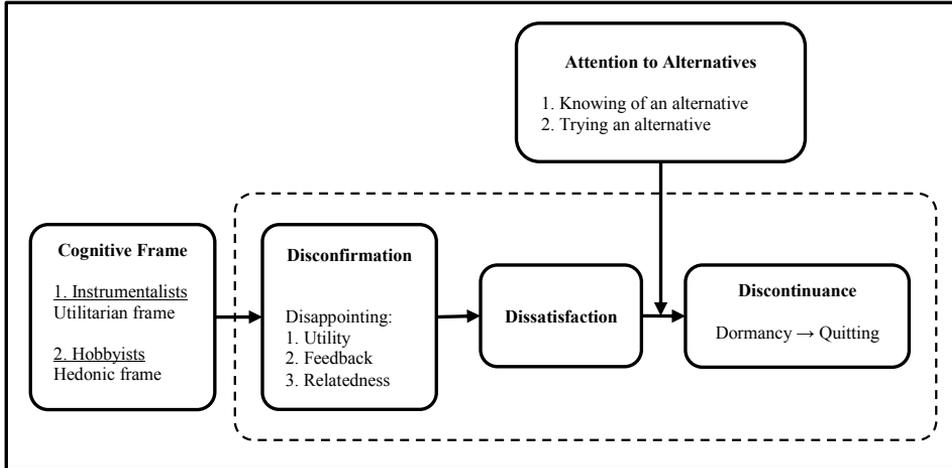
Figure 2 Conceptual model for use discontinuance of volitional mixed IS

Dissatisfaction key antecedents

Our findings imply that users of volitional systems utilize them to their own needs regardless of what purpose was initially attributed to the IS artifact by design. While Scoopshot was initially offered as a platform that facilitates transacting between media organizations and crowd photographers; users developed their perceptions and expectations based on their own goals and needs, which played a significant role in framing their sources of dissatisfaction. We identified two groups of users based on their dominant cognitive frames. In line with Lindenber (2001), we find that those with more utilitarian frame, pay less attention to aspects of enjoyment and focus more on aspects of gain, and vice versa for users with more hedonic frame.

Dissatisfaction for the first group of users, the *instrumentalists* with utilitarian frame dominating, was predominantly attributed to disappointing utility, as suggested by EDT (Bhattacherjee, 2001b; Lee, 2010). This is in general accord with IS discontinuance studies in organizational settings (e.g. Furneaux & Wade, 2011). The important issue to note here, however, is that particularly for volitional mixed systems, the definition of utility varies greatly from one user to another. While it may be interpreted in terms of financial gains by some users, others may discard the importance of money altogether and focus on non-financial benefits, such as publicity and career advancement. In other words, the utility is not predefined, as in the context of more utilitarian and mandated systems, but dependent on what the individual user intends to utilize the system for.

The sources of dissatisfaction for the second group, the *hobbyists* with hedonic frame dominating, were more surprising. What seemed to irritate these users the most was not low

perceived usefulness of the system, but its failure to satisfy their more hedonistic aspirations (e.g., enjoying social networking features). The effect of such values on users' productivity in volitional use contexts has been acknowledged in IS literature. In the context of open source software (OSS) development, feedback from others was found to affirm that one's activities are useful to others and further motivate (unpaid) code contribution (Shah, 2006). Similarly, newcomers receiving feedback on their initial postings in online newsgroups have been found to be more likely to post again than without the feedback (Joyce & Kraut, 2006). Motivation literature provides an explanation regarding the role of feedback and social relatedness on human behaviour. Intrinsically motivated behaviours require the fulfilment of the three psychological needs for autonomy, competence and relatedness. While joining and participation in Scoopshot is an entirely volitional behaviour with no punitive repercussions (thus fulfilling the users' basic need for autonomy); for the period this study was conducted, the participants did not find features in place to satisfy their needs for competence (e.g., voting, commenting) and relatedness (e.g., sharing and connecting with peers). Interestingly, the hobbyists in our study viewed these features as more valuable than the financial reward. Actually, earning money did not prevent dissatisfied hobbyists from quitting Scoopshot, in some cases even without getting reimbursed for their latest assignment.

Explaining discontinuance

Our study supports the assertion that use discontinuance is a process that takes shape over time: a period of dormancy precedes the eventual decision to permanently end the use-lifecycle. The distinction between dormancy and quitting parallels to some extent what Pollard (2003) referred to as temporary stalling and permanent rejection in the context of organizational GSS. The terms stalling and rejecting denote a form of imposition from the organization on its employees as well as the employees' resistance behaviour to organizational change efforts. In our case context, the crowdsourcing system's users have complete autonomy and volition over their choices and decisions, and dormancy and quitting better describe the behaviours we have observed.

Consistent with the EDT theory, our findings show that dissatisfaction with Scoopshot, for the various reported reasons, is a key antecedent of dormancy, the first stage of discontinuance. However, it is not always the only factor in making the user to transition from active, continued use to dormancy. The availability of alternative systems that are perceived better in one way or another appears to be an important condition that needs to be satisfied before users move from dormancy to the quitting stage. In other words, attention to alternatives has a significant role in amplifying or mitigating the impact of dissatisfaction on

discontinuance. As such, lack of awareness of alternatives can explain why some users continue using a system that they are dissatisfied with.

IS literature suggests that *attention to alternatives* consists both of a cognitive component (e.g., knowing about an alternative) and a conative or a behavioural component (e.g., trying out an alternative) (see e.g. Kim & Son 2009). In practical terms, attention to alternatives denotes that a user of a focal system knows about the availability of an alternative and that he or she has also tried out that alternative. Also the role of attention to alternatives on individuals' satisfaction and behaviour has been acknowledged in earlier research (Cooper, 1991; Oliver et al., 1994; Jen & Hu, 2003; Spiller et al., 2007; Bhattacherjee et al., 2012). For example, in the context of Internet service contracts, the consumers were found to discontinue their current contract only when finding a better alternative or receiving a better offer (Spiller et al., 2007). It is also important to note that the impact of attention to alternatives on discontinuance is conceptually and temporally different from the impact of disconfirmation on dissatisfaction. On one hand, dissatisfaction resulting from disconfirmed expectations is based on a comparison between what a user expects of an IS and what it delivers. On the other hand, attention to alternatives initiates a comparison between the performances of two alternative systems.

To summarize, the transition from dormancy to quitting seems to be heavily contingent on dissatisfaction (with its respective sources), but also on the users' ability to find a suitable alternative to the focal system. Once a satisfactory replacement is found, keeping the focal system or removing it becomes irrelevant, in most cases. This was demonstrated by many of our respondents who attributed removing Scoopshot to trivial reasons such "buying a new phone" and "freeing up memory", while in fact Scoopshot had been replaced already by an alternative during the dormancy stage.

Contributions

As with all empirical research, the current study was faced with a number of trade-offs and limitations. Firstly, the empirical evidence is from a single case study and a limited number of participants, which can limit the findings' generalizability to domains beyond the studied context. Therefore, we do not claim that our findings are applicable and readily generalizable to all types of volitional mixed systems, in the sense of statistical generalizability. However, as Lee and Baskerville (2003) have explained, qualitative research like ours can make analytical generalizability claims, that is, generalizability from empirical statements to theory. Secondly, our choice of the computer mediated communication (CMC) strategy with the

interviewees might have moderated the richness of the interview context (Moisander & Valtonen, 2006). Nonetheless, it is long established that richness or leanness is not an inherent property of electronic communication per se; rather context-dependent (Lee, 1994). As such, CMC interviewing should not be perceived as better or worse than face-to-face interviewing; it is merely a different qualitative approach (Brabham, 2010) with its own set of merits and limitations.

Nonetheless, despite its acknowledged limitations, our study offers insights both to theory and practice. To theory, the implications are threefold. First, we found that use discontinuance, the central point of interest in this research, is a process consisting of two conceptually and temporally different stages: *dormancy* and *quitting*. Hence, reducing discontinuance to a quitting decision is an oversimplification of reality and can be misleading in terms of design recommendations. Second, we suggest that while EDT would seem adequate for explaining discontinuance of instrumentalist users with utilitarian frame, it would provide little explanation for users who are more driven by the system's hedonic value. Our findings suggest that for hobbyist users with hedonic frame, satisfying the basic needs of *autonomy* (e.g., volition), *competence* (e.g., positive feedback) and *relatedness* (e.g., social networking) is a fundamental condition to maintain motivation. Additionally, *attention to alternatives* has shown to have a major role in explaining discontinuance. This proposition explains for example why some users, despite their dissatisfaction with a system, may persist on using it. Third, we propose a mid-range theory (as conceptually abstracted in Figure 2) that is empirically grounded and theoretically informed for discontinuance of volitional mixed systems. As the name implies, mid-range theories describe a type of theory that "is moderately abstract, has limited scope, and can easily lead to testable hypotheses" (Gregor 2006, p. 616).

Our findings also point to a number of practical implications, particularly in terms of recommendations that could alleviate volitional mixed system's users' feelings of dissatisfaction. Our findings suggest that crowdsourcing organizers seeking continued participation should identify the types of users they serve and cater for their expectations.

For instrumentalist type users, the goal should be to reduce the gap between their utility expectations and what the service offers in practice. Also in marketing, the crowdsourcing organizers should make clear what is promised and what is possible, for example, whether all or just some contributions will be financially rewarded. Secondly, crowdsourcing organizers, particularly those operating as market intermediaries in two-sided networks, should dedicate substantial attention to expanding the number of partners also on the buying side of the network. This implication is supported by what economists refer to as cross-side network

effect, which simply suggests an increase in the attractiveness of a platform within a user segment on one side due to an increase in the number of users on the other (see e.g., Rysman 2009; Gawer 2014).

Then, the hobbyist type users seem to be affected less by the cross-side network effect and more by the same-side network effect, which describe the fact that drawing users to one side increases the attractiveness of that side (see e.g., Eisenmann et al. 2006). This calls for crowdsourcing organizers to nurture a community, rather than a mere marketplace for selling and buying content. Highlighting the utilitarian aspect of such platforms, while ignoring the hedonic value that users expect to experience, would eventually translate to short-term usage span. To motivate users who expect other value besides financial rewards, crowdsourcing organizers need to provide features that facilitate the fulfilment of their needs for autonomy (i.e., volition), competence (i.e., feedback) and relatedness (i.e., social networking). It is worth noting that in October 2014, Scoopshot released the most significant update since its launch in 2010, adding new features including within-community communication, such as commenting on and following other Scoopshooters.

While without direct control over their users' attention to alternatives, crowdsourcing organizers could adopt a strategy that increases the users' switching costs. Switching costs are conceptualized as potential losses that could result from terminating the existing relationship with a system and establishing a new one (see e.g. Kim & Son, 2009). One such strategy would be to utilize a gamification feature, such as a scoring mechanism (Blohm & Leimeister, 2013) with points awarded to all contributions (content, peer-evaluation, etc.) (see, Blohm et al. 2013). Introducing such a scoring system could have a dual effect on the service's users: adding a scoring system could amplify the constraint mechanism (i.e., barrier to discontinuance) by fuelling the users' feeling of loss if and when they consider switching to alternatives; and more importantly, scores would work as a feedback mechanism on one's contributions, thus enhancing their basic need for competence.

Conclusions

This study is a part of on-going longitudinal research on the use lifecycle of a photography crowdsourcing platform. First and foremost, it is concerned with understanding and explaining use discontinuance of volitionally used mixed systems (i.e., Type-6 IS). This is to our best knowledge the first study on IS discontinuance of this type of systems. In the empirical setting of Scoopshot, our first aim was to understand discontinuance and the various factors leading to its manifestation as experienced by the study participants. Our second aim was to provide a mid-range theory for explaining use discontinuance.

We found that there were two distinct types of users: hobbyists, who were predominantly motivated by the service's hedonic value and did not attach much significance to the financial reward; and instrumentalists, who in contrast were mostly driven by the service's utility and did not attach much value to its hedonic aspects. Our findings indicate that discontinuance is a multi-stage phenomenon, where a period of non-usage (i.e., dormancy) precedes the decision to ultimately end the relationship with the system (i.e., quitting). Most importantly, we found that the main source of dissatisfaction differed for hobbyist and instrumentalist users. While decreasing perception of usefulness (i.e., disappointing utility) was the dominant source of dissatisfaction for instrumentalists; the unfulfilled basic needs for competence and relatedness were the main sources of dissatisfaction for hobbyist users.

The distinction between utilitarian and hedonic systems is increasingly difficult to make, and this is very much the case in volitionally adopted and used systems. Such systems need to embrace a mixed stance, providing their users both utility and enjoyment. To fully understand the dynamics and the changing nature of the factors leading users to continue or discontinue the use of these systems requires both more theorizing as well as further empirical research. Future studies should investigate the validity of our findings with a wider set of empirical data, with different IS. Future research should pay more attention to the impact of attention to alternatives on use discontinuance of the various IS types. We expect that the lack of alternatives would offset the impact of dissatisfaction on discontinuance. In the particular setting of crowdsourcing, deeper understanding of the motivations and changes in them over time with different types of initiatives (integrative and selective, as well as one-off and recurrent) could provide valuable new knowledge on users' motivation formation and sustenance processes.

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Appendix 1: Interviewees demographics and dates of interviews

Name*	Interviewee Location	Age**	Sex	Occupation	First Interview Round	Second Interview Round
Scoopshot Management						
Nico	Finland	--	M	Scoopshot CEO	Feb 2012	--
Petri	Finland	--	M	Scoopshot COO (founder)	Feb 2012	--
Scoopshooters						
Ali	Finland	37	M	Marketer and entrepreneur	Apr. 2012	Aug. 2014
Anita	The Netherlands	27	F	Social media marketing	May 2012	May 2014
Anon-1	Hong Kong	27**	M	News reporter	Apr. 2013	--
Anon-2	Canada	21	M	Student/salesman	--	Dec. 2014
Björn	Sweden	42	M	Professional chef	Oct. 2012	May 2014
Cesar	Chile	26	M	Retail store worker	May 2012	May 2014
Daan	The Netherlands	17**	M	Part-time bartender	Sep. 2012	--
Earvin	The Netherlands	19**	M	Journalism student/marketer	Sep. 2012	--
Gabor	The Netherlands	35	M	Professional Journalist	--	Dec. 2014
Jackie	The Netherlands	46	F	Restaurant worker	Apr. 2012	June 2014
Jari	Finland	38	M	After-sales manager	May 2012	Sep. 2014
Joost	The Netherlands	30	M	School teacher	Apr. 2013	May 2014
Kaisa	Finland	29	F	Food engineer	May 2012	Sep. 2014
Marco	Mexico	27**	M	Communication Engineer	May 2013	--
Max	Austria	21**	M	Shop assistant	May 2013	--
Pekka	Finland	40	M	Car parts dealer	--	Nov. 2014
Peo	Sweden	45	M	Operations manager	May 2012	Sep. 2014
Vasco	The Netherlands	33	M	Factory worker	May 2012	May 2014

* Except for Anon-1 and Anon-2, all participants have granted us their consent to use their real first names.

** For those who did not participate in the second interview round, age corresponds to the first interview round.

Appendix 2: Interview protocol

Opening Session:

- Hi ------! I hope you remember our talk a while ago. As a reminder, my focus is on understanding usage behavior of information systems, and I've been doing my investigation on an application called Scoopshot, and I would like to hear from you about your experience.
- Now, I'm basically investigating how your Scoopshot experience has evolved? Still using it regularly? Not so often? Or stopped using it?
- Do you still use Scoopshot?
- When was the last time you used it?
- To organize our discussion, I will be interested in hearing from you about three phases over time:
  - 1) The time when you first heard of Scoopshot and decided to try it out.
  - 2) The time when you used it quite regularly.
  - 3) The time when you started losing interest, and eventually uninstalled it.
- Do these three stages describe what you've been through over time?

Core Questions:

- In the previous interviews we had about a year ago, you were still in the "user" stage. Today, you are not. I am trying to understand exactly (and as clearly as possible) how and why this happened?
- Simply put, could you explain how you went from stage 2 to stage 3?
- So, what was the biggest disappointment in your Scoopshot experience? I mean features that you expected it to have but weren't there?
- So, in your opinion what kind of features might have interested you to keep using it?
- Would these features keep you interested even if you are not getting paid for your photos?
- So, how long did it take before you decided to remove it from your phone?
- How do you think Scoopshot could be improved?
- I mean, what could the app have done differently to make you more interested, and using it today?
- So, do you think that the availability of other photo apps (like Instagram) affected how you evaluate Scoopshot?
- So, if Instagram did not exist, what are the chances of you using Scoopshot today?
- Have you felt any kind of loss by removing Scoopshot?

Ending Session:

- By the way, may I use your real first name in my research, which could be published in an academic journal?
- Thank you very much for your time and patience!
- May I contact you again if I have more questions?

Appendix 3: User profiles

Users	Use motivations and sources of dissatisfaction	Profile
Ali	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and social connectedness. *"Well, first of all I like and do photography. Second, I like the idea … [of] getting fresh photos from "normal" people instead of a professional photographer … I also like the fact that the photos are not made how the photographer wants to present the situation, they were exactly what people see."* [April, 2012]. **Roots of dissatisfaction:** Lack of feedback and social networking. *"As a user I'm also looking for other things such as enjoyment, interaction, etc. I'm not sure how flexible they can be at Scoopshot. Perhaps they could add some kind of interaction between users, something like Facebook."* [April, 2012]. *"[The main disappointment was that] there was nothing in return; I don't mean only payments, but no comment, no feedback, nothing. One way communication doesn't work as you know :) … I guess most people who continue using the service are somewhat interested in photography. So, even a feedback system would do something positive."* [August, 2014].	Hobbyist
Anita	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and social connectedness. *"I thought that I could be a photographer 'on the fly' with my pictures in the news (online, offline I didn't know)."* [May, 2014]. **Roots of dissatisfaction:** Lack of feedback and social networking features. *"In the period I used it [Scoopshot], I got zero replies. Not even 'well done, we are gonna use this picture on our wall of news moments, this is not a paid thing, but we do like to share this picture'. For me it had to do with awareness and sharing of my name … It's like screaming on the north pole and hope you are getting heard on the south pole."* [May, 2014].	Hobbyist
Anon-1	**Dominant frame:** Utilitarian. **Primary motivation:** Anon-1 is a professional reporter, who is employed by a famous newspaper. He uses Scoopshot during non-official work hours as a source of additional income.	Instrumentalist
Anon-2	**Dominant frame:** Hedonic. **Primary motivation:** Mainly for fun. *"I'm interested in photography in the first place (and still am) … It [Scoopshot] was over my expectations, sold a pic almost right away which was cool."* [December, 2014].	Hobbyist

	Roots of dissatisfaction: Need for more fun tasks. "*About the app, I would have appreciated more fun missions for sure.*" [December, 2014].	
Björn	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and social connectedness. "*I really enjoy shooting and also sharing, and if I get paid for it it's a bonus. I still share photos on Facebook, Instagram etc.*" [October, 2012]. "*As a hobby-photographer, I of course like when people notice my photos, and even comment on them as most photographers probably do*" [May, 2014]. **Roots of dissatisfaction:** Lack of feedback and social networking features. "*I basically got bored of it, since nothing got back to me … some kind of feedback on [my] photos … If you, let's say, are a writer, and you keep writing and sending your articles to a magazine, paper or others, and nothing ever happened with it, you would probably get bored to, right?*" [May, 2014]	Hobbyist
Cesar	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and publicity. "*My name was on the newspaper when my photo was selected. For me that was more important that the money; that my friends say: wow Cesar did you take that photo?*" [May, 2012]. **Roots of dissatisfaction:** Lack of feedback, social networking features, and need for more local tasks. "*[Scoopshot is missing] comments of other people who use Scoopshot … I would like to see a picture of a user to give my point of view and be able to contribute more to that information.*" [May, 2014]. "*[Scoopshot] should incorporate photo competitions with themes related to my city or country.*" [May, 2014].	Hobbyist
Daan	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment. "*It's really fun, it's exciting. Every day I watch to see if there is a new task. And every new task is a surprise. When I read the task, I form an image in my head. Then I'll go and realize that image as good as possible.*" [September, 2012].	Hobbyist
Earvin	**Dominant frame:** Utilitarian. **Primary motivation:** Career-oriented goals. "*I'm studying journalism. And in that way I can always refer to my own work. It can help me getting a job in the future working for a paper.*" [September, 2012].	Instrumentalist

Gabor	**Dominant frame:** Utilitarian. **Primary motivation:** Career-oriented goals. "*As a professional photo and video journalist I tried to use it [Scoopshot] in a way to confront them [i.e., newspapers] with the downsides of their choice to use photos of MOtP's [i.e., members of the public] instead of professionals.*" [December, 2014]. **Roots of dissatisfaction:** Low earnings offered by Scoopshot. "*I really think there are enough free images quickly available via Facebook, Twitter and Instagram. So for the media there is no real need to use a third party as Scoopshot ... For professionals the earnings offered over Scoopshot are too low. So these together made it [Scoopshot] kind of useless nowadays.*" [December, 2014].	Instrumentalist
Jackie	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment. "*Scoopshot was just for fun ... it was funny to create something [i.e., a photo] with my son in the forest. We had quite a laugh when sending it. So the most [obvious] reason was, it was possible, haha.*" [April, 2012]. "*It is funny to see my own pic in the newspaper! But if they [Scoopshot] would ever sell my shot for money, I won't refuse it, but it's not my first approach.*" [April, 2012]. **Roots of dissatisfaction:** Lack of feedback and social connectedness. "*[Scoopshot was missing] maybe more interaction. Like Instagram, you can share with friends ... It [Scoopshot] ended on page 6 on my Phone, just faded awayyyyy. It's not anymore tickling my imagination.*" [June, 2014]. "*It had no feedback, like my pics were sent in the big black nothing. So at one point, I thought, why bother?*" [June, 2014].	Hobbyist
Jari	**Dominant frame:** Utilitarian. **Primary motivation:** Jari sees Scoopshot more of a business application, and considers himself a "mission hunter" who follows and completes photography tasks. He has sold over 500 photos. "*I have a job where I travel around Finland, so I have took photos about 400 kilometers from home ... Best places I have had like over 100 photos in few hours.*" [May, 2012]. **Roots of dissatisfaction:** Need for more paying tasks. "*Things have gotten worse with this app ... Maybe I am a little disappointed lately. First, I thought this is easy way to gain some extra income and there was lots of missions. But for the last year, missions have mostly been weird and there hasn't been so many of them ... For example, take a photo from your dog ... [or] take a picture of your smile. So first I was very satisfied but lately been a little disappointed.*" [September, 2014].	Instrumentalist

Joost	**Dominant frame:** Utilitarian. **Primary motivation:** Career-oriented goals. "*I am more motivated to do it for my job [as a teacher, and] for the company of my parents … They grow eels, [so I] make advertisement for their shop or put eels in the picture.*" [May, 2013]. **Roots of dissatisfaction:** Need for more serious and relevant tasks. "*I guess I like to send more serious things than [the] mostly funny tasks of Scoopshot, like, 'today it's getting warm: send your BBQ photo?!'*" [May, 2014]	Instrumentalist
Kaisa	**Dominant frame:** Utilitarian. **Primary motivation:** Kaisa sees Scoopshot more of a business application; she can be considered as a "mission hunter", selling over 800 photos by May 2012. She would follow tasks as far as can, but "*basically that the cost would be covered by the photo-shooting, and also earn some extra.*" [May, 2012]. **Roots of dissatisfaction:** Need for more serious and paying tasks. "*I think it has gone worse, missions have gone worse. And in some missions you should have almost quality camera that you could participate. Weird missions and very few in Finland … [like] summer shoes and rubber duck.*"[September, 2014].	Instrumentalist
Marco	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment of 'creative challenges'. "*Well, the most important thing to keep sending photos is the tasks, some of them are very interesting and represent a challenge to take some good photos … some tasks sent by Scoopshot are very interesting like the 'creative idea for photo' or 'the best shoot of your pet', or 'city at night'. For me [it] is not only [a matter of] taking pictures of the topics or tasks; it represents a challenge because you must be in the right place in the right moment, so if the topic or task is interesting [, it] will be a motivation to take the camera and go out and shoot.*" [May, 2013].	Hobbyist
Max	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment. "*Just for fun … The idea [behind Scoopshot] is good and I want to support this.*" [May, 2013].	Hobbyist
Pekka	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and Fun. "*Well, for a while it was something nice to do with my spouse. We drove around places looking for companies which were not pictured yet … it was fun*". [November, 2014]. **Roots of dissatisfaction:** Lack of feedback and social connectedness.	Hobbyist

	"*There should be something really interesting inside the app. For example, in Instagram your Facebook friends and everyone else who is in there can "like" your posts. [In Scoopshot], it was too 'narrow'.*" [November, 2014]. "*[What I like about Instagram is that] it offers me easy chance to see my friends' photos and also easy chance to browse through completely strangers and their pictures.*" [November, 2014].	
Peo	**Dominant frame:** Utilitarian. **Primary motivation:** Career-oriented goals. Peo owns and runs a photography company, and considers Scoopshot to be mainly a business tool. "*Since I'm a very active photographer I see it [Scoopshot] as an alternative way to spread my pictures and get additional income*" [May, 2012]. **Roots of dissatisfaction:** Not selling enough photos at desired price. "*It was a very long time since I sold through Scoopshot ... Ok, my shots aren't cheap, but still not expensive in comparison to others ... From what I understand it [Scoopshot] wasn't intended as a pro tool ... I try to sell my photos directly to the papers, and don't consider me being an amateur. And I for sure don't use my mobile to take photos that I intend to sell.*" [September, 2014].	Instrumentalist
Vasco	**Dominant frame:** Hedonic. **Primary motivation:** Enjoyment and publicity. "*Because I want my pictures to be seen in the newspaper ... [It was nice to] get a picture [published] in the newspaper ... [The payment was] not much, but I was famous for a few days.*" [May, 2012]. **Roots of dissatisfaction:** Lack of social connectedness. "*[Scoopshot was missing] interaction with social networks ... and [making] friends using Scoopshot.*" [May, 2014].	Hobbyist

Crowdsourcing reflects the idea that a firm or a person, in an effort to solve specific problem(s), seeks voluntary help from the general public via an open call, by utilizing the available information and communication technologies (ICT). As such, crowdsourcing is at the heart of the interplay between actors of varying objectives and motives: between organizations seeking survival and co-evolution with their environments, humans seeking the fulfillment of their basic and economic needs, and technological artifacts featuring certain logics, designs and capabilities. The intricate nature of this socio-techno-economic mesh warrants a multi-disciplinary research orientation with multiple levels of analysis. The dissertation at hand provides such treatment, and shows that a successful crowdsourcing endeavor begins with the careful understanding and alignment of the different objectives of those involved.

BUSINESS +
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DESIGN +
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TECHNOLOGY

CROSSOVER

DOCTORAL
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