

The Anatomy of an Engaging Crowdsourcing Experience

DISSERTATION
of the University of St. Gallen,
School of Management,
Economics, Law, Social Sciences
and International Affairs
to obtain the title of
Doctor of Philosophy in Management

submitted by

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from

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Dissertation no. 5027

D-Druck Spescha, St. Gallen 2020

The University of St.Gallen, School of Management, Economics, Law, Social Sciences and International Affairs hereby consents to the printing of the present dissertation, without hereby expressing any opinion on the views herein expressed.

St.Gallen, May 18, 2020

The President:

Prof. Dr. Bernhard Ehrenzeller

Acknowledgements

This doctoral thesis is the result of my work at the Institute of Information Management at the University of St.Gallen (IWI-HSG). The past few years were an intense ride. Thinking back, my time at the Institute was related to hard work and adaptation. Coming from the fast-moving world of Business and Consulting, where the real art is to draw smart conclusions even from the smallest amounts of data and in the most insecure environments, delving into the academic world of scientific research was quite a change and one of the greatest learning journeys in my life. Even though writing a dissertation is ultimately an individual effort, many people contributed to the successful outcome of this endeavor. My deep gratitude goes to all my supporters in this journey:

First, I want to thank my doctor father Prof. Jan Marco Leimeister, who challenged me over and over again, but also trusted me and gave me the freedom and support when needed. He helped me to develop my skill set, to expand my network, and he taught me the essentials of business information systems. Without his mentorship, going beyond my time at the Institute, this thesis would not exist. In addition to that, I would like to thank Prof. Ivo Blohm, who served as my day to day supervisor during my two years at the Competence Center Crowdsourcing. Thanks for all the patience and advice. I am also very thankful to Prof. Torsten Tomczak, the co-supervisor of my thesis, for spending his valuable time on discussing various aspects of my dissertation work and for his support and advice.

I extend my gratitude to my former colleagues Dr. Niklas Leicht, Dr. Philipp Haas, Dr. Nicolas Knop, Stefan Kleinschmidt, and Dr. Marcel Rhyn for all the joyful office moments. Thanks to the cohort of PhD students, Susanne Gmünder, and the chair of information management, who made my time at the Institute much more enjoyable. This dissertation would not have been possible without my colleagues from the SAP Innovation Center Network. I have been fortunate to have their support and the provision of a great research environment. I want to thank the whole team, in particular Dr. Uli Eisert, Dr. Jonas Kahlert, Dr. Jonas Böhm, Dr. Nicola Terrenghi and Charlotte Lekkas for this joint ride!

Special thanks go to all my friends and colleagues, who supported me in some or all phases throughout this journey: Dr. Nina Zobel, Dr. Thomas Möllers, Dr. Daniel Gerster, Dr. Benjamin Spottke, Dr. Christiane Lehrer, Asja Stefanelli, Jaspreet Narang, Vanessa Forney, Luise Ammerschuber, Clara Leistenschneider, Anna-Karina Schmitt, Nina Gheruha, Nathalie Huth, Maciek Nowakowski, Ismini Lokka, and Daniel Karaj.

Lastly, my loving family deserves my deepest gratitude. I thank my parents Luise and Michael, my brother Robert, and my cousin Franziska, who supported and believed in me from day one. I am deeply grateful to Jonas, my partner, advisor, colleague, and best friend for his love, patience and support far beyond the horizon of this dissertation.

St.Gallen, May 2020

Julia Troll

Abstract

Crowdsourcing is an emerging global trend. Eighty-five percent of the top hundred global brands employ IT-based platforms to engage with crowds outside the firm, particularly for software testing and new digital services development with consumers. Some companies, such as Starbucks or Netflix, impressively demonstrated the potential of such platforms as a source of innovation and cost savings. However, looking at the overall success rates, research showed that 90 percent of those initiatives fail to engage contributors over time.

Hence, the notion of engagement is of utmost importance to better understand how crowdsourcing platforms can be leveraged effectively by firms. The growing body of literature on crowdsourcing takes a traditional product-dominant view, one in which the central purpose of the firm is to outsource activities to develop and improve outputs more efficiently. However, existing research on the phenomenon falls short in understanding the needs of the crowd as a form of social capital. In general, the question of how a firm can employ a service-dominant view to effectively manage such platforms with consumers is understudied in fields like information systems, service research, organizational behavior, and management science. This thesis aims to work toward closing this gap by looking at the *Crowdsourcing Experience* itself, which every crowdsourcee is exposed to throughout the *Crowdsourcing Journey* and which needs to be understood to foster engagement. *Crowdsourcing Engagement* is conceptualized as a process that leads to short and long-term platform responses due to satisfying experiences that aggregate into a commitment state. Multiple empirical data sources have been provided by the *Crowdsourcing Consortium*, and innovative qualitative and quantitative research methods are applied for this purpose.

As an initial step, this thesis proposes a theoretical framework of the IT-enabled engagement process based on literature. This framework is then enriched with empirical findings from assessing multiple crowdsourcing cases with the purpose of testing and improving digital services with consumers. Four different categories of stimuli, which influence crowdsourcers' engagement, are derived: 1) *Door Openers* (e.g., invitation mail); 2) *Risk Factors* (e.g., the crowdsourcing platform); 3) *Game Changers* (e.g., social interaction); and 4) *Value Adders* (e.g., gamification features). In a next step, three deep-dive studies provide surprising insights on the role of one proposed *Game Changer*, one *Risk Factor*, and one moderating factor (the incorporation of a *Crowdsourcing Intermediary*) for engagement formation. Lastly, a modernized perspective on crowdsourcing with consumers, grounded in the service dominant logic, is proposed.

It extends the existing body of knowledge in the fields of crowdsourcing and engagement and dissolves contradictory findings from prior studies by overcoming conceptual and methodological weaknesses. The integration of the two rather new phenomena has the advantage of providing knowledge for researchers from the fields of information systems, service research, and consumer behavior. Practical contributions are transformed into an eight-step management framework for creating and maintaining engaging experiences.

Kurzdarstellung

Crowdsourcing ist ein aufkommender globaler Trend. 85 Prozent der hundert weltweit führenden Marken setzen IT-basierte Plattformen ein, um mit “Crowds” außerhalb des Unternehmens zusammenzuarbeiten, insbesondere für Softwaretesting und für die Entwicklung neuer digitaler Dienste mit Konsumenten. Einige Unternehmen wie Starbucks oder Netflix haben das Potenzial solcher Plattformen als Quelle für Innovation und Kosteneinsparungen eindrucksvoll demonstriert. Jedoch schaffen es 90 Prozent dieser Initiativen nicht, Mitwirkende langfristig an die Plattform zu binden.

Daher ist der Begriff des “Engagements” von wichtiger Bedeutung, um besser zu verstehen, wie Crowdsourcing-Plattformen von Unternehmen effektiv eingesetzt werden können. Die Literatur zum Thema Crowdsourcing nimmt eine traditionell produkt-dominierende Sichtweise ein, bei der der zentrale Zweck des Unternehmens darin besteht, Aktivitäten auszulagern, um die Effizienz zu verbessern. Jedoch beleuchtet die derzeitige Forschung zu diesem Phänomen nicht ausreichend die Bedürfnisse der Crowd. Generell wird die Frage, wie Firmen eine service-dominante (SD) Sichtweise einsetzen können, um solche IT-basierten Crowdsourcing-Plattformen effektiv zu verwalten nicht ausreichend beleuchtet (z.B. in der Wirtschaftsinformatik oder Serviceforschung). Die Motivation ist es diese Lücke zu schließen, indem die *Crowdsourcing-Experience* der Mitwirkenden während der *Crowdsourcing-Journey* in den Mittelpunkt gestellt wird. *Crowdsourcing Engagement* ist als Prozess konzeptualisiert, der auf Basis von zufriedenstellenden Erlebnissen, kurz- und langfristige Aktivitäten fördert und aggregiert sich zu einem Commitment-Zustand entwickelt. Ein Konsortium aus Crowdsourcern hat qualitative und quantitative Daten bereitgestellt. Innovative Forschungsmethoden werden darauf angewendet.

In einem ersten Schritt wird ein theoretischer Rahmen für den IT-gestützten Engagement-Prozess konzipiert. Dieser wird dann mit empirischen Ergebnissen aus Fallstudien angereichert. Vier verschiedene Kategorien von Stimuli, die das Engagement von Mitwirkenden unterschiedlich beeinflussen werden abgeleitet: 1) *Door Opener*, z.B. Einladungs 2) *Risk Factors*, z.B. Plattformnutzung 3) *Game Changers*, z.B. soziale Interaktion und 4) *Value Adders*, z.B. Gamification-Elemente. In einem nächsten Schritt werden drei tiefergehende Studien vorgestellt, in denen ein *Game Changer*, ein *Risk Factor* und ein moderierender Faktor, die Einbeziehung eines *Crowdsourcing-Intermediärs*, näher beleuchtet werden. Schließlich wird eine auf SD-Logik-basierende, moderne Perspektive für Crowdsourcing mit Konsumenten vorgeschlagen. Diese Arbeit erweitert das bestehende Wissen auf den Gebieten Crowdsourcing und Engagement und löst widersprüchliche Ergebnisse aus früheren Studien auf. Die Integration der beiden eher neuen Phänomene hat den Vorteil, dass Wissen für ein breiteres Publikum bereitgestellt wird, insbesondere Forschern aus den Bereichen Wirtschaftsinformatik, Serviceforschung, Consumer Behavior. Praktische Beiträge werden in ein achtstufiges Managementmodell umgewandelt, um nachhaltige Engagement-Erlebnisse zu kreieren.

List of Publications

During my time as a Ph.D. student and research associate at the Institute of Information Management at the University of St.Gallen under the supervision of Prof. Dr. Jan Marco Leimeister, I authored five publications and developed three manuscripts that are planned for future publication. Since these publications and manuscripts are closely related to the topic of my dissertation, the content of my dissertation and publications may overlap. None of the here mentioned publications is presented in its original form in this monograph. Every single chapter of this monograph provides a unique contribution, not presented elsewhere. In addition, findings and contributions in this monograph are based on an extended data base that was not part of any existing publication. I provide a brief note at the beginning of each chapter that highlights the publication(s) that influenced the content of the specific chapter.

Publications

Troll, J., Blohm, I., & Leimeister, J. M. (2016). Revealing the Impact of the Crowdsourcing Experience on the Engagement Process. In: International Conference on Information Systems (ICIS). Dublin, Ireland.

Troll, J., & Blohm, I. (2017). How Does the Crowdsourcing Experience Impact Participants' Engagement? An Empirical Illustration. In: Wirtschaftsinformatik (WI 2017), St. Gallen, Switzerland.

Troll, J., Naef, S., & Blohm, I. (2017). A Mixed Method Approach to Understanding Crowdsources' Engagement Behavior. In: International Conference on Information Systems (ICIS). Seoul, South Korea.

Troll, J. (2018). Arouse Your Crowd! The Dual Role of Social Interactivity for Crowdsources' Engagement. In: Academy of Management Annual Meeting (AOM). Chicago, Illinois, USA.

Troll, J., Blohm, I., & Leimeister, J. M. (2018). Why Incorporating a Platform-Intermediary can Increase Crowdsources' Engagement. In: Business & Information Systems Engineering (BISE Journal), 1-18.

Manuscripts:

Troll, J., Blohm, I., & Leimeister, J. M. (2020). Humanizing Crowdsourcing Platforms: Understanding the Effect of Social Interactivity on Platform Engagement.

Troll, J., Blohm, I., & Leimeister, J. M. (2020). Managing Crowd Engagement Strategically – 8 Steps for Building a Lasting Foundation For Crowdsourcing Success.

Troll, J., Blohm, I., & Leimeister, J. M. (2020). Value Proposition Co-Creation in Virtual Environments – A Modernized View on Crowdsourcing with Consumers.

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List of Abbreviations

AC	Affective Commitment
ACC	Affective and Calculative Commitment
AIC	Akaike Information Criterion
C2C	Crowd-to-Crowd
CB	Consumer Behavior
CC	Calculative Commitment
CX	Customer Experience
FMCG	Fast-Moving Consumer Goods
GDL	Goods-Dominant Logic
HCI	Human Computer Interactions
I2C	Initiator-to-Crowd
IS	Information Science
NC	No Commitment
Negbin2	Negative Binominal Model
OB	Organizational Behavior
OI	Open Innovation
P-Value	Probability Value
SDL	Service-Dominant Logic
Seq.	Sequence
SILT	Sequential Incident Laddering
T	Time
UGF	Uses and Gratifications Framework
UX	User Experience
VCE	Virtual Consumer Environments
VPCC	Value Proposition Co-Creation
WOM	Word of Mouth
YST	Yield Shift Theory
RQ	Research Question
DSR	Design Science Research

Chapter I

Introduction

*Motivation and Relevance of the Research Topic,
Research Gap, and Structure of the Thesis*

1 Introduction

What is the value of crowdsourcing without a crowd? None.

What is the value of crowdsourcing without an engaged crowd? Limited.

What is crowdsourcing with an unhappy crowd? A potential threat.

1.1 Motivation and Relevance of the Research Topic

Dell's crowdsourcing platform "Idea Storm" engaged 4,285 external contributors to generate 8,801 ideas in only two years (Bayus, 2013). The "Netflix Prize" attracted almost 20,000 submissions from 30,000 participants after one year (Villarroel, Taylor, & Tucci, 2013). "My Starbucks Idea" achieved more than 100,000 submissions in four years (Lee & Seo, 2013).

Crowdsourcing is an emerging global trend, which 85 percent of the top hundred global brands try to take advantage of (Owyang, 2015). While, there are several functions of crowdsourcing, such as design and innovation or software development and testing (Vuković, 2009), it broadly defines a participative, IT-mediated activity in which a given entity (i.e., the crowdsourcer) proposes a task to a crowd to create mutual benefit (Blohm, Leimeister, & Krcmar, 2013).

Success cases like the one of *Dell*, *Netflix* and *Starbucks*, which engaged huge crowds and led to impactful outcomes, inspired companies globally. Especially in the field of software testing and online service development, crowdsourcing is gaining popularity as a way of actively engaging end-users and experts for assessing and improving software products as well as generating differentiated service experiences (Johnson, Menor, Roth, & Chase, 2000; Sigala, 2012). Crowdsourced software testing is an approach where diverse pools of people, ranging from end-users to testing experts, test software products in real environments, using their own devices to identify functional bugs and weaknesses related to the overall user experience (Leicht, Blohm, & Leimeister, 2017). In this context, crowdsourcing and testing digital services (e.g., web-based platforms and applications) with (potential) customers or end-users (later on referred to as consumers) is particularly interesting, as outputs can be shared online and virtually co-developed or tested for gaining direct market intelligence and creating early user-awareness (Kristensson, Matthing, & Johansson, 2008).

Over the past five years, many of the world's most valuable brands (e.g., Coca-Cola, HP, Ford) increased their number of initiatives by over 30 percent per year (Pétavy, 2017; Roth, Petavy, & Braz de Matos, 2016). However, looking at the actual success rates of 23,809 firms, around 90 percent of them failed to engage contributors, meaning that they received less than 30 responses on their platforms per year (Dahlander & Piezunka, 2014). Some

failed to engage contributors at all, but even for those firms that managed to initially win a large crowd, participation inequality was a common phenomenon. Also referred to the 90:10:1 principle, a common observation is that 90 percent of participants are mostly passive, 9 percent show mediocre engagement, and only 1 percent show top engagement (McConnell & Huba, 2007; Nonnecke & Preece, 2000). Thus, while the act of crowdsourcing is heading toward mainstream, the practice is still new and knowledge regarding proven success drivers that foster active and lasting participation is limited. Hence, the question arises: What made projects, like the ones of *Dell*, *Netflix*, and *Starbucks* so successful?

In order to assess the potential value and success of crowdsourcing, researchers' and practitioners' primary attention was so far paid to e.g., understanding and improving the absorption of knowledge (Blohm et al., 2013), the efficiency of crowdsourcing processes (Geiger, Seedorf, Schulze, Nickerson, & Schader, 2011; Stol & Fitzgerald, 2014; Vuković, 2009), or the quality of contributions (Afuah & Tucci, 2012; Poetz & Schreier, 2012). Nevertheless, less attention was paid to understanding and handling the needs and desires of crowdsourcees (i.e., the participants), whose participation, inputs, and loyalty is eventually responsible for the initiative's success. In the end, crowdsourcing is all about people and the question of how to motivate them and even more importantly of how to keep them engaged over time to co-create value with the crowdsourcer.

The meaning of value and the process of value creation are shifting from a product-centric (i.e., Good-Dominant) to an experience-based (i.e., Service-Dominant) view. This requires managers to stop thinking solely in terms of tangible outputs and transactional processes, but instead to focus more on co-creation experiences (Prahalad & Ramaswamy, 2004). In this regard, Storbacka, Brodie, Böhmman, Maglio, and Nenonen (2016) suggest that the micro foundation of the macro construct of value co-creation is engagement, determined by the conceptual and physical context that can be described as the co-creation experience. Without engagement, no resource integration can occur and consequently no value can be co-created. Whereas a high level of engagement even may create additional benefits that go beyond the quantity and quality of contributions, such as participation loyalty and referral value.

Looking at successful crowdsourcing projects in terms of their huge crowds and intense participation, value is assumable not only created by gaining short-term access to external resources over a virtual platform. Instead, those projects are based on long-term relationships between crowdsourcer and the crowd, by which mutual learning and diverse value contributions are important side-effects. Hence, this thesis argues that a largely neglected aspect in crowdsourcing research is the *Crowdsourcing Experience* itself, which every crowdsourcee is necessarily exposed to throughout the IT-mediated *Crowdsourcing Journey* and which needs to be understood, designed, and managed strategically by the crowdsourcer. Crowdsourcing initiators not only risk to lose valuable participants and destroy brand value due to perceived negative experiences (e.g., see "Pril's crowdsourcing

flop” as a showpiece of a destructive crowdsourcing project (Gassmann, Winterhalter, & Wecht, 2013)), but also a promising opportunity to stimulate high quality input and crowdsourcees’ overall engagement with the crowdsourcer’s organization.

In this thesis, the *Crowdsourcing Experience* is defined as a crowdsourcee’s internal and subjective perception of the end-to-end IT-mediated *Crowdsourcing Journey*, consisting of a series of stimuli and resulting in a psychological state (Troll, Blohm, & Leimeister, 2016). *Crowdsourcing Engagement* is conceptualized as a process that leads to short and long-term responses due to satisfying experiences that aggregate into a commitment state (Troll, 2018; Troll, Blohm, & Leimeister, 2018). It is not defined as an end-state by itself but rather a psychological state of different intensity levels that changes over time and that can be observed and measured based on the activities that crowdsourcees directly devote to the crowdsourcing platform (e.g., contributions) and that indirectly create sustained value for the crowdsourcer (e.g., consumption and positive word of mouth). As crowdsourcees may take on many roles, like a platform-mediated worker, a community member, a (potential) consumer and influencer, the engagement value of crowdsourcing is assumed to be multidimensional (Blohm et al., 2013). Contributions may range from (over) fulfillment of task and enhanced collaboration within the participation phase, to repeat participation, positive word of mouth, and referral as well as consumption behavior after participation, motivated through the interaction. As suggested by Storbacka et al. (2016) specific experiences are supposed to dominantly impact the engagement process.

First authors have emphasized the need for researching crowdsourcing from an experience-based perspective (Füller, Mühlbacher, Matzler, & Jawecki, 2009; Pedersen et al., 2013; Vuković, 2009) as well as studying the processes and mechanisms that lead to mutual benefits (Zwass, 2010). While interest grows, no existing research takes a holistic process perspective to systematically assess the crowdsourcee’s end-to-end experience and to find psychological and behavioral explanations for engagement formation and related stimuli-characteristics. Therefore, this dissertation aims to answer the overall research question:

What determines an engaging crowdsourcing experience and how can it be effectively managed?

Consequently, a theoretical framework of the IT-enabled engagement formation process is developed based on a comprehensive literature review and enriched by studying qualitatively and quantitatively multiple crowdsourcing cases with the purpose of testing and improving digital services with consumers. Based on interview and log-data, more and less successful patterns of mechanisms and related stimuli-characteristics are identified and conclusions drawn for defining and designing engaging crowdsourcing initiatives. Lastly, an alternative perspective on crowdsourcing is provided, one that is grounded in the Service-Dominant view.

This dissertation aims to:

- (1) Develop a *theoretical framework* of the IT-enabled engagement formation process.
- (2) Apply the framework to the *context of crowdsourcing*.
- (3) Explore a diverse set of crowdsourcing projects to *enrich the model* with insights from observations with small and large samples.
- (4) Conduct *deep dive analyses* to assess the impact of specific stimuli.
- (5) Provide a *modernized view* on Crowdsourcing with consumers.

1.2 Illustration of the Research Gap

Some authors have emphasized the need for researching crowdsourcing from an experience-based perspective (Füller et al., 2009; Pedersen et al., 2013; Vuković, 2009) and studying the processes and mechanisms that lead to mutual benefits (Zwass, 2010).

In order to identify the state of the art knowledge concerning this topic, a literature review was conducted, covering combined key words like "Crowdsourcing" and "Experience" or related terms from the field as "Engagement", "Loyalty", or "Sustained Participation", by querying the following databases and conducting forward and backward search: EBSCOhost, ProQuest, JSTOR, and ScienceDirect.

The review identified 56 articles in total, directly or indirectly, touching the topic of "*Crowdsourcing Experience*" and the associated field of engagement (see Table 1 for details). Articles can be grouped by the following topics: 1) the crowdsourcing function (e.g., innovation, funding, problem-solving); 2) the crowdsourcing context (e.g., educational, work, consumer-context); 3) research goals (e.g., sustained participation, quality of contributions or brand value); 4) theoretical lenses (e.g., motivation, engagement, experience or behavioral science).

		EBSCO		Proquest		JSTOR		Science Direct	
		Scholarly Peer Reviewed		Peer Reviewed		Journals		Journals	
Search String		Hit	Reviewed	Hit	Reviewed	Hit	Reviewed	Hit	Reviewed
"Crowdsourcing" AND "Experience"		22	10	48	4	110	3	52	4
"Crowdsourcing" AND "Engagement"		40	18	50	2	73	5	25	7
"Crowdsourcing" AND "Loyalty "		2	1	4	1	15	2	1	1
"Crowdsourcing" AND "Sustained participation"		3	3	1	1	123	5	5	3
		67	32	103	8	321	15	83	15
Forward & Backward Search		12							
Articles identified as relevant		56							

Table 1. Overview of Results from the Literature Review

Interestingly, many articles focus on the *educational* and *work context*, with activities in the field of *innovation*, and the goal of understanding the impact of *initial motivation* and specific behaviors on *contributions' quantity or quality*. Only a few articles actually take an *experience-based perspective* on crowdsourcing (as understood in this thesis) and deal with the topic of *engagement* to explain attitudes and participation behavior.

To gain an impression of papers that fall into that category, findings are shortly summarized:

- De Vreede et al. (2013) explain *initial participants' engagement* in *open collaboration* settings, suggesting personal interest, goal clarity, and motivation as antecedents.
- Sun, Fang, and Lim (2012) found that *task-complexity* and *self-efficacy* are drivers of *sustained participation* in *micro-task-oriented crowdsourcing*.
- Nguyen et al. (2015) proposed a *participant engagement index* for crowdsourcing based on the characteristics of contributions.
- Riedl, Blohm, Leimeister, and Krcmar (2013) found a positive impact of *platform-design choices* on *crowdsourcers' attitudes*.
- Schulten and Schaefer (2015) found a positive impact of *crowdsourcing-process satisfaction* and *a sense of virtual community* on *affective commitment*.
- Djelassi and Decoopman (2013) observed that crowdsourcing participation is perceived as a *hedonic experience*, enhancing *brand image*.
- Nambisan and Nambisan (2008) are one of the few authors, who actually recognized the benefits beyond the innovation outcomes of virtual consumer environments, such as relationship building with the firm. They define different types of customer experiences (usability, hedonic, pragmatic and social experiences) and map them to a type of task to increase contribution quality and loyalty.
- Brawley and Pury (2016) investigated MTurkWorker's job satisfaction and find that few of the traditional predictors of job satisfaction were significant. They conclude that it needs a new operational definition and entirely new variables in order to adequately understand the experiences of crowdsourcers.
- Kohler, Fueller, Matzler, and Stieger (2011) conducted a 20-month action research project to study the user's experiences and to identify design principles for virtual co-creation system. They found that collaboration and interaction is key for users.
- Chen, Drennan, Andrews, and Hollebeek (2018) found that customer-to-customer user experience sharing in online communities acts as a key driver of both firm-desired customer efforts and customer insights.
- Brabham (2010) explains why crowds participate in crowdsourcing processes, based on interview research. They found four primary motivators: the opportunity to make money, to develop one's creative skills, to take up freelance work, the love of the community and addiction.

While interest grows and initial research attempts exist, so far no study conducted an exhaustive literature review to properly define *engagement* for the context of *crowdsourcing*, nor a rigorous examination of the underlying mechanisms that drive engagement throughout the interaction process. The following research opportunities were identified, which mainly inspired the work of this dissertation:

- By looking at mainly (causal) relationships between unidimensional definitions of engagement (i.e., in terms of either attitudinal or behavioral metrics such as satisfaction or sustained participation) and individual variables (e.g., goal clarity, task complexity, sense of community) the final engagement outcome and ensuing business value cannot be fully explained. This is assumed to result from a more complex interplay of experiences with perceived interaction points and their intermediate, subconscious evaluations by crowdsourcees.
- Moreover, engagement behavior is so far defined in terms of contributions related to the task. Due to the diverse roles of crowdsourcees (e.g., workers, consumers, crowd-members) and crowdsourcers' intention (e.g., feedback, relationship-building, manpower), other behavioral responses need to be investigated that potentially generate direct or indirect value (e.g., short and long-term platform activity, word of mouth, willingness to return, and more to be defined).
- Lastly, existing studies focus mainly on the participation phase, in which crowdsourcees work on the task and provide their contributions. However, influential experiences may also occur before and after participation (e.g., invitation, registration, or compensation).

Therefore, this dissertation suggests to take a *process perspective* by systematically assessing *input-*, *process-*, *output-* and other related *context-factors* along the end-to-end crowdsourcees' experience to understand what exactly determines *crowdsourcing engagement* and how an engaging *crowdsourcing journey* must be designed and managed.

1.3 Research Questions and Methodology

In order to accomplish the overall research goal of this dissertation project, *four more specific research questions* (RQ) are proposed. While those questions build on each other and findings supplement each other, they are still structured and framed in a way to depict stand-alone contributions. Figure 1 gives an overview of the proposed four research questions, the corresponding methodological approach, and expected outcomes.

Various data collection and analysis techniques from the three generic methodological approaches 1) *literature review*, 2) *qualitative methods*, and 3) *quantitative research* were selected. Each method applied was dependent on the research question that needed to be answered and its methodological requirements.

Due to the relatively newness of the two major research fields (i.e., *Crowdsourcing* and *Engagement*) the thesis starts with *explorative research* and *proposition development*, based on a rich set of *qualitative interview-data* that is gained from *multiple crowdsourcing cases* to understand *how* and *why* engagement develops.

In a later stage, *log-data analysis* is conducted to *quantitatively test hypotheses* related to the impact of a specific stimulus on *engagement behaviors*. At the end, based on key learnings from the empirical work, an *artefact* in form of a management model is constructed and *management guidelines* proposed, which represent the managerial impact of this work. A more detailed description of each method used across the studies presented in this dissertation can be found in the subsequent Chapters.

Dissertation Project			
What determines an engaging Crowdsourcing Experience and how can it be effectively managed?			
Research Question 1	Research Question 2	Research Question 3	Research Question 4
What is the current state-of-the-art knowledge regarding the concept and process of engagement and how can it be theoretically applied to crowdsourcing?	How does the crowdsourcing experience impact the engagement process throughout the crowdsourcing journey?	How and why do - crowdsourcing intermediaries - monetary incentives - social interactions affect crowdsources' engagement formation?	How to design and manage a crowdsourcing project with the goal of increasing engagement?
Literature Review	Multiple Case Study, Interview + Platform Data	Contrasting + Single Case Studies, Interview + Log-Data	Conceptualization
Research Outcomes: - Verified research gap - Crowdsourcing-specific definition of engagement - Development of a research model	Research Outcomes: - Blueprint of a generalized crowdsourcing journey - Enriched engagement process model and theory	Research Outcomes: - Validated engagement-driving stimuli-characteristics - Approach for platform-based log-data analytics	Research Outcomes: - Crowdsourcing project-management framework - Engagement guidelines
Theoretical Foundation	Empirical Assessment		Artefact Construction

Figure 1. Overview of Research Questions, Methods and Outcomes

Source: Own Illustration

RQ 1: What is the current state-of-the-art knowledge regarding the concept and process of engagement and how can it be theoretically applied to crowdsourcing?

To better understand the role and formation process of engagement in a crowdsourcing context, first, the general research field of *crowdsourcing* is introduced and existing knowledge gaps related to the meaning of *crowdsourcing success* outlined. In a second step, the relevant body of knowledge concerning the *concept and process of engagement* is identified and analyzed in detail. Due to the interdisciplinary character of crowdsourcing and the multiple roles of crowdsources (i.e., platform-mediated workers, technology users, community members, and potential or actual consumers and influencers) several perspectives of engagement are considered (i.e., user-, work-, community-, and customer engagement) from different research fields (i.e., IS, marketing, community, and

organizational behavior). Based on insights from the different fields, a *generalized engagement definition* and *process model* is derived. In a third step, a *crowdsourcing-specific engagement definition* is introduced and a conceptual framework of the engagement process along the so-called crowdsourcing journey is developed as a base for further research.

RQ 2: How does the crowdsourcing experience impact the engagement process throughout the crowdsourcing journey?

Research question two aims at qualitatively exploring and extending the conceptual framework of the engagement process along the so-called *crowdsourcing journey* that was developed as a result of research question one. In a first step, the goal is to identify all stimuli, provided and managed by the crowdsourcer and to come up with a *crowdsourcing journey blueprint* that helps to compare crowdsourcees' experiences across different crowdsourcing projects. In a second step, the impact of identified stimuli on the engagement formation process of crowdsourcees is systematically explored across different crowdsourcing cases. Hence, *case study research* for "theory elaboration" (Lee, Mitchell, & Sablinski, 1999) is applied. At this point, the state of knowledge concerning the engagement process is still low, while complexity of the research phenomenon is high. Moreover, a so called "holistic, multiple-case" design is chosen to verify findings within and across cases (Yin, 2013). Different data sources that provide information about a) provided stimuli within the crowdsourcing journey, b) perceived experiences of crowdsourcees, c) and behavioral responses need to be triangulated by conducting interviews with crowdsourcing initiators and crowdsourcees. Cases were selected based on similar task-design and crowd-characteristics, but different stimuli characteristics. As a result of research question two, an *extended model of the engagement process* is provided, which is enriched by the dominant psychological patterns, and four different types of *stimuli groups* that were found to stimulate engagement across cases are proposed.

RQ 3: How and why do a) crowdsourcing intermediaries, b) monetary incentives, and c) social interactions affect crowdsourcees' engagement formation?

Based on the insights derived from research question two, research question three focuses on further exploring *specific stimuli*, either due to substantial knowledge gaps or to verify propositions with richer data and larger sample sizes. For the first two deep dive studies, the *role of crowdsourcing intermediaries* as well as the *role of monetary reward* as potential process-input factors within the crowdsourcees' engagement formation process are assessed. Therefore, *four common crowdsourcing cases* are deliberately selected and analyzed, which offer *contrasting management situations* (i.e., mediated vs. non-mediated; financially rewarded vs. non-rewarded cases), while being comparable in all other parameters (Yin, 2013). The third deep dive study aims at validating and further differentiating the *role of social interaction* as a potential key driver within the engagement

formation process. Therefore, *log-data* in combination with additional interview data is assessed to derive insights on behavioral and psychological engagement output factors.

By qualitatively and quantitatively assessing the impact of different types of stimuli on the engagement formation process, *refined propositions* and an *advanced theoretical model* is proposed.

RQ 4: How to design and manage a crowdsourcing project with the goal of increasing engagement?

The goal of research question four is to operationalize knowledge gained from prior research questions and to develop an *artefact* that supports crowdsourcers in *planning, designing, and managing projects* with the goal of increasing engagement among crowdsourcees, within and after the participation phase. The artefact will be part of the *managerial implications* that are presented at the end of this dissertation.

1.4 Empirical Data Collection Approach

In 2015, the Competence Center Crowdsourcing from the Institute of Information Management at the University St.Gallen (led by Prof. Dr. Jan Marco Leimeister and Prof. Dr. Ivo Blohm) established a researcher-facilitated *Consortium on Crowdsourcing* with eight partner organizations that participated over the course of three years.

Consortium Research is traditionally defined as a multilateral form of collaborative research in which practitioners grant researchers access to their knowledge, data, business environments, and financial means to support research activities, while getting first-hand access to new knowledge (Österle & Otto, 2010). It originally comes from the design-oriented IS research field, which aims at delivering results which are of scientific rigor and of practical relevance at the same time.

All partner organizations of the crowdsourcing consortium had one common goal: *Learning more about crowdsourcing and successfully applying it in the software testing and online service development context to overcome current challenges in IT departments.*

With an increasingly dynamic environment, shorter product lifecycles, ongoing cost pressure, and a faster growing hardware market, *software testing* and *online service development* grew in effort and complexity (Leicht et al., 2017). Given those increased challenges, traditional testing and online service development became less economically and practicably. *Crowdsourced software testing* is an approach where diverse pools of people, ranging from end-users to testing experts test software products in real environments using their own devices to identify functional bugs and weaknesses related to the overall user experience. Crowdsourcing that aims to *develop or improve online services* is closely related to crowdsourced software testing and often involves rather end-users than experts.

Consortium partners saw great potential in applying crowdsourcing for these activities. However, as crowdsourcing was a completely new field for all of them and applying its principles without any experiences was seen as too risky, those organizations decided to team up and join the crowdsourcing consortium to collaboratively learn from failures and successes by applying a diverse range of approaches over the course of more than three years (Österle & Otto, 2010).

Overall, the consortium consisted of four researchers and 19 practitioners, serving as representatives from a diverse range of organizations from the field of banking, insurance, retail, telecommunication, manufacturing, and transport. Bi- to tri-annual researcher-facilitated workshops served as the major interaction medium for all consortium members. Besides enabling direct and indirect knowledge exchange, the workshops served as a vehicle to build and validate concepts, artefacts, and tools provided by the researchers that members were able to reuse for future crowdsourcing activities. In addition to consortium members, theme-dependent guest speakers and experts from the field of crowdsourcing were invited to those workshops to provide access to even more knowledge sources.

Next to those workshops, researchers supported individual projects of participating organizations and conducted in depth case studies. To enable steep learning curves within the consortium, an iterative approach for setting up individual crowdsourcing projects in the field of software testing and online service development, was selected. By that, facilitators ensured, that organizations were in slightly different project lifecycle phases and could learn from each other's experiences before making them by themselves.

While the overall goal of the consortium was to become an expert in conducting crowdsourced software testing and online service development, *crowd engagement* turned out to be a major theme and was identified as a foundation for crowdsourcing success, shortly after all members finished their first own projects. In the *Quarter-Four of 2016 Workshop* (Q4/2016), *Crowd Engagement* was voted as a top challenge and consortium members, together with researchers, decided to invest time and resources to gain insights on how to strategically engage crowdsourcees. Over the course of the next two consortium years, a significant part of each workshop was contributed to the topic of engagement.

In the *Quarter-One of 2017 Workshop* (Q1/2017), the foundation was built, by developing a *crowdsourcing journey blueprint* and assumptions on relevant interaction points collected that potentially affected crowdsourcees engagement. This was then followed by an *in depth case study*. Multiple projects were assessed and in-depth interviews with crowdsourcees conducted to gain insights on experiences along the journey blue prints to identify *critical touchpoints*.

In the next workshop in *Quarter-Two of 2017 Workshop* (Q2/2017), research findings were presented and discussed with all consortium members and experts from professional crowdsourcing platforms, so called intermediaries (Atizo and Passbrains). As a result, a couple of more in depth research questions arose, related to *the role of an intermediary and*

monetary incentives as well as the identified key engagement driver of *social interaction*.

To find answers to those questions, researchers followed up by *comparing interview data from contrasting cases* within the consortium panel and by conducting additional *log-data analysis* based on interaction data on crowdsourcing platforms to assess behavioral patterns.

In a last collaborative session in *Quarter-Three of 2017 Workshop (Q3/2017)*, all insights gained on the topic of *Crowd Engagement* were summarized, *good-practice approaches* for managing relevant engagement drivers collected and *overall guidelines* defined. Figure 2 illustrates the data collection process for this thesis in the context of the crowdsourcing consortium approach

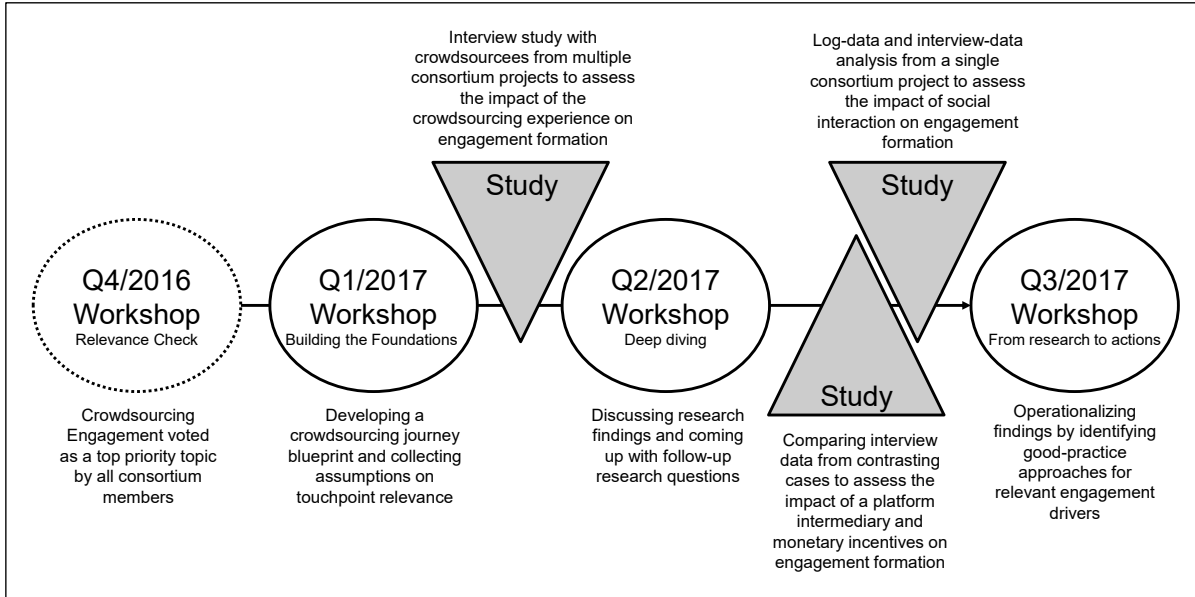


Figure 2. Empirical Data Collection Process with the Crowdsourcing Consortium

Source: Own Illustration

1.5 Structure of the Dissertation

To answer the outlined research questions, presented in the previous section, this dissertation is structured as displayed in Figure 3.

Chapter two serves to answer research question one. It focuses on providing a context of the research fields of crowdsourcing and engagement and on setting the foundations by connecting those two fields and proposing a basic model of the *crowdsourcing engagement process*.

Chapter three provides insights from the multiple case study based on the crowdsourcing journey blueprint as a response to research question two. As a key finding, four stimuli groups are presented, which were found to play different roles within crowdsourcers' engagement processes. The chapter concludes by providing generalized engagement formation propositions and an enriched process model.

Chapter four reacts to the first part of research question three, by presenting the insights from the first deep dive study on the role of the intermediary for engagement formation. It provides a theoretical background about crowdsourcing intermediaries in general and comes up with some early assumptions on their impact on engagement formation. Contrasting cases are presented to reveal differences between engagement formation processes of crowdsourcees, who interacted with an intermediary and those who only interacted with a crowdsourcer as a single point of contact. The chapter concludes by providing an enriched process model that considers the existence of a crowdsourcing intermediary.

Chapter five reacts to the second part of research question three, by presenting the insights from the second deep dive study on the role of monetary incentives for engagement formation. It provides a theoretical background about the different types of crowdsourcing rewards in general and comes up with some early assumptions on their impact on engagement formation. Contrasting cases are presented to reveal differences between engagement formation processes of crowdsourcees, who expected a financial reward and those who did not. The chapter concludes by providing an enriched process model that considers the existence of a monetary reward.

Chapter six reacts to the third part of research question three, by presenting the insights from the last deep dive study on the role of social interaction for engagement formation. It provides a theoretical background about the role and potential benefits of perceived social interaction within the crowdsourcing journey. Based on prior findings from the multiple case study as well as the insights from a comprehensive literature review, hypotheses are formulated and tested with log-data and further explained with interview studies. The chapter concludes by providing an enriched process model that considers different types of social interactions.

Chapter seven offers a modernized perspective on crowdsourcing with consumers. It is a reaction to a couple of reviewer comments that were received throughout the lifecycle of this dissertation project. While crowdsourcing seems to be widely known, with a relatively large research community, many different sub-forms exist and contradictory and ambiguous terms as well as outdated views are used. Hence, by taking on a service-research perspective, this chapter offers a broadened view that specifically applies for crowdsourcing projects with consumers and that is grounded in the service-dominant logic. Due to its clear philosophical foundation, it provides a framework for theorizing, confirming, and refining crowdsourcing research.

The dissertation concludes in **Chapter eight** with the summary of the contributions from both a theoretical and practical perspective and outlines directions of future research. The section about the managerial implications relates to research question four.

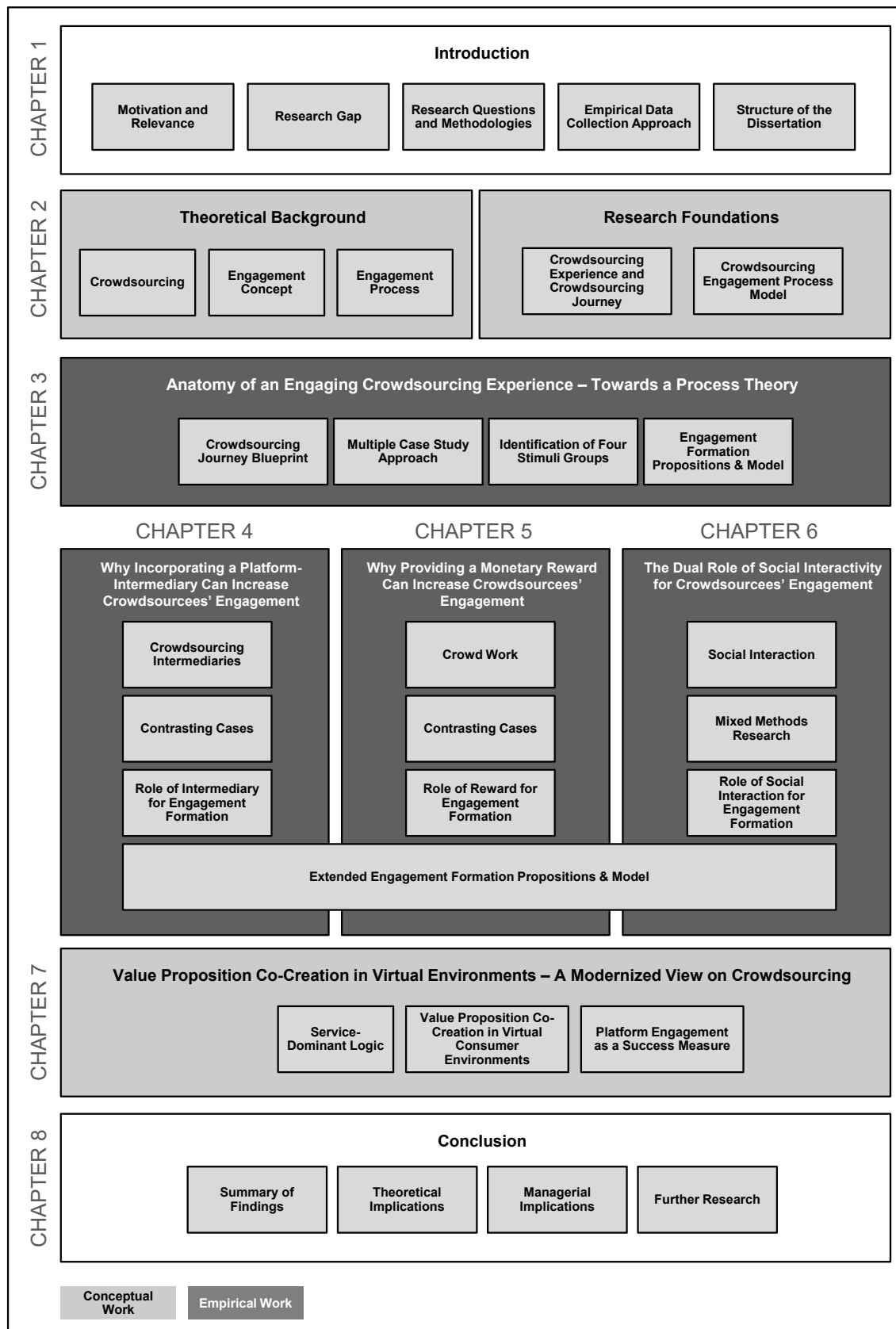


Figure 3. Structure of the Thesis

Source: Own Illustration

Chapter II

Theoretical Background & Research Foundations

*Introducing the Crowdsourcing Phenomenon and
Engagement Concept*

2 Theoretical Background and Research Foundations

This Chapter serves to answer research question one. It focuses on providing a context of the research fields of crowdsourcing and engagement and on setting the foundations by connecting those two fields and proposing a basic model of the *crowdsourcing engagement process*.

This Chapter builds on the following publications¹:

Troll, J., Blohm, I., & Leimeister, J. M. (2016). Revealing the Impact of the Crowdsourcing Experience on the Engagement Process. In: International Conference on Information Systems (ICIS). Dublin, Ireland.

Troll, J., & Blohm, I. (2017). How Does the Crowdsourcing Experience Impact Participants' Engagement? An Empirical Illustration. In: Wirtschaftsinformatik (WI 2017), St. Gallen, Switzerland.

Troll, J., Blohm, I., & Leimeister, J. M. (2018). Why Incorporating a Platform-Intermediary can Increase Crowdsources' Engagement. In: Business & Information Systems Engineering (BISE Journal), 1-18.

¹ Selected sections from the here mentioned publications have informed this chapter. A significant amount of new content was added for the purpose of this monograph. References provided where applicable (see text).

2.1 Crowdsourcing

“Remember outsourcing? Sending jobs to India and China is so 2003. The new pool of cheap labor: everyday people using their spare cycles to create content, solve problems, even do corporate R & D” – this is how Howe (2006) once introduced crowdsourcing to the world in his famous *Wired* article. While this thesis is going to challenge the idea that goes with this statement, it helps to understand where this approach is coming from and with what intention it was originally applied.

The fundamental idea of crowdsourcing is that a crowdsourcer (e.g., a company) proposes to an undefined group of contributors (i.e., individuals), henceforth called crowdsourcees, the voluntary undertaking of a task presented in an open call (Blohm et al., 2013). Or as Howe (2006) originally put it, “crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people.”. The ensuing interaction process unfolds over IT-based crowdsourcing platforms, owned and managed by the crowdsourcer himself or provided by an intermediary. (e.g., Innocentive or Testbird).

Intermediaries may either serve as market places, offering a virtual platform where crowdsourcer and crowdsourcees simply interact for the purpose of value co-creation, or they may even serve as mediators, who offer additional services such as task specification, crowd acquisition, and evaluation of results to support the end-to-end crowdsourcing process and thus enable crowdsourcers to quickly set up a project without acquiring all necessary skills and resources (Zogaj, Bretschneider, & Leimeister, 2014).

In their comprehensive and (according to them) exhaustive literature review, Estellés-Arolas and González-Ladrón-De-Guevara (2012) came up with eight characteristics common to any given crowdsourcing initiative, which will be respected in this thesis:

- (1) there is a clearly defined crowd
- (2) there exists a task with a clear goal
- (3) the recompense received by the crowd is clear
- (4) the crowdsourcer is clearly identified
- (5) the compensation to be received by the crowdsourcer is clearly defined
- (6) it is an online assigned process of participative type
- (7) it uses an open call of variable extent
- (8) it uses the internet

Besides these characteristics, there are several forms of crowdsourcing, which can be categorized according to their specific crowdsourcing function. Vuković (2009) differentiates between four types of functions, representing the product or service lifecycle-

part that is crowdsourced by the project: 1) design and innovation, 2) development and testing, 3) marketing and sales, or 4) support. While entities that crowdsource design processes rather benefit from the crowd's innovation power (e.g., Threadless.com), those who conduct marketing-related projects rely on its predictive power (e.g., Predictify). Other forms of crowdsourcing make use of the simple mass and diversity of people that can be reached. In the case of crowdtesting (or crowdsourced software testing), either experts (e.g., for complex tasks) or potential end-users (for micro tasks) are approached to test, e.g., applications or webpages regarding their functions, usability, or interface-design (e.g., Testbirds.com).

Similarly, building on the work of Geiger et al. (2011), Blohm, Zogaj, Bretschneider, and Leimeister (2018) distinguish between four different types of crowdsourcing platforms depending on the diversity (i.e., homogeneous vs. heterogeneous) and aggregation (i.e., selective vs. integrative) of contributions that are created on them: 1) microtasking (i.e., selective and homogenous), 2) information pooling (i.e., integrative and homogeneous), 3) broadcast search (i.e., selective and heterogeneous), and 4) open collaboration (i.e., integrative and heterogeneous). While microtasking refers to simplistic tasks and highly pre-determined contributions (e.g., translating a text), broadcast search looks for alternative and creative solutions of different contributors for the same problem to increase the chance that a suitable solution is found. Information pooling uses the additive aggregation of inputs (e.g., to predict trends) and open collaboration is used to create complex artefacts (e.g., wikis) that integrate distributed knowledge. Nevertheless, hybrid forms of tasks and platforms supporting several different types of projects are very common nowadays. As it was mentioned in the introduction, especially the combination of crowdtesting new online services and asking the crowd to also provide feedback and ideas for improvements can be found a lot. Initiatives with these type of hybrid tasks that are in the center of the project is the focus of this dissertation project and all cases explored.

Moreover, crowdsourcing is found in all type of industries and project contexts, around the globe. In their comprehensive "State of Crowdsourcing" report, Eyeka (a crowdsourcing leader with a network of more than 400,000 creatives across 164 countries) shows that although crowdsourcing had initially been most embraced by digital marketers in more innovative verticals (e.g., consumer electronics), fast-moving consumer-good brands had become the most active crowdsourcing users, with leaders such as Procter & Gamble, Unilever, Nestlé, PepsiCo and Johnson & Johnson (Pétavy, 2017). After a head-start in 2015, Eyeka even observed an increase in crowdsourcing activities by about 30 percent in 2017, among those brands. Interestingly, in the creative field the number of ideation contests increased even more than the number of content contests (i.e., 43 verses 27 percent). According to Eyeka, this was most probably motivated by an increased investment towards innovation in general to regain consumer preferences in a rapidly evolving context. Consumer Electronics, Finance and Travel sectors are following closely the fast-moving consumer sector, with also significant activity growth (according to Eyeka's data from 2017).

Finally, the Pharmaceutical and Automotive sectors have seen triple digit growth of their crowdsourcing activity in 2016 and 2017, although they are still referred to as the emerging users. It is worth noting that all these sectors are ripe for digital disruption with a need to reinvent their business model and evolve towards a more consumer-centric mindset, and that crowdsourcing offers solutions to address these concerns.

Therefore, especially in the field of new digital service developments, crowdsourcing is gaining popularity as a way of actively engaging consumers for testing, improving or generating differentiated service experiences (Johnson et al., 2000; Sigala, 2012). In this context, crowdsourcing digital services (e.g., web-based platforms or applications) with (potential) customers or end-users is particularly interesting, as outputs can be shared online for gaining direct market intelligence and achieving quick attachment among actual or potential consumers (Kristensson et al., 2008). A typical example is provided by UPC Cablecom, the largest broadband cable operator in Switzerland, which invites consumers to test new, digital services, like mobile applications, TV- or internet-offerings, via a crowdsourcing platform, before official market launch.

Nevertheless, independent of the type and ultimate output objective of a crowdsourcing project, crowdsourcer and crowdsourcees engage in a participative, IT-mediated interaction process to create mutual benefit (Estellés-Arolas & González-Ladrón-De-Guevara, 2012). Thus, in a broader context, this process is often related to the macro-construct of value co-creation by which organizations open themselves up for co-creation efforts with external individuals (Storbacka et al., 2016; Zwass, 2010). For the crowdsourcer, value and project success is multidimensional (Blohm et al., 2013). First, it may involve solving a crowdsourcer's problem that cannot be satisfactorily solved in-house (Blohm, Riedl, Füller, & Leimeister, 2016). Yet, the generated value may go beyond problem solving, and indirect benefits like enhanced brand visibility and reputation are desired side-effects of a successful campaign (Ye & Kankanhalli, 2015). LaToza and Van Der Hoek (2015) identified the following drivers and motivations of firms to initiate crowdsourcing projects:

- reduced time to market
- generating alternative solutions
- employing specialists
- learning through work
- the democratization of participation

Similarly, for crowdsourcees the benefit of participation can be of economic nature (i.e., a reward or remuneration) or may satisfy other needs, like social recognition, self-esteem, skill development, or entertainment (Estellés-Arolas & González-Ladrón-De-Guevara, 2012). When contributions and achievements are financially remunerated, crowdsourcing is sometimes referred to as *crowd work* (Durward, Blohm, & Leimeister, 2016). In this case, the initial motivation to participate and contribute is rather extrinsic and still other factors, experienced throughout the interaction process, may influence the sustained commitment, attitude and behavior towards the crowdsourcer as well as the output quality.

While quite some research about the initial motivation to participate exists and many studies conclude that it is often a combination of expected learning opportunities, social interaction and financial remuneration (in the case of crowd work) (e.g., Brabham, 2010; Füller, 2010; Mao et al., 2013; Zhao & Zhu, 2014), no research deals with the topic of sustained motivation and engagement throughout the whole crowdsourcing process.

It needs to be differentiated between the initial reason why someone considers joining and why someone becomes an active contributor over time, creating mutual benefits. When talking about *crowdsourcing success*, this thesis talks about the latter (i.e., sustained crowd-participation), while the first can be rather understood as success with crowd-acquisition. As was mentioned in the introduction, crowdsourcees can take on several roles throughout the crowdsourcing process, ranging from a platform-mediated worker (e.g., solving a problem and potentially obtaining a reward in return), to a community member (e.g., fostering interaction and enjoying social exchange) and being or becoming a consumer and influencer of the crowdsourcer (e.g., learning about offerings and spreading the word). Accordingly, this thesis argues that value goes beyond simple transactions of resources (e.g., contributions, rewards) between crowdsourcer and crowdsourcees and success needs to be defined more holistically.

In this context, Storbacka et al. (2016) illustrate that engagement is the micro-foundation of value co-creation. Without engagement, no resource integration can occur and no value can be co-created. It is argued that the conceptual and physical context determines why, when and how an individual engages. Hence, it is assumed that crowdsourcees' engagement is inseparably linked to the perceived co-creation experience within the interaction process.

2.2 The Concept of Engagement

Etymologically speaking, to “engage” oneself meant to mortgage land long before it was formally stated in a contract, like the act of an engagement is understood in the case of marriage (Axelson & Flick, 2010). In either way, it was a serious act in which one promised to act on something and another person had to rely on this. *Gage*, the Norman root word, means to “pledge”, that is tying oneself to a course of action by oath. Nevertheless, today, to be “engaged” is often referred to when someone is entirely present and not somewhere else.

Engagement as a concept is used in many different research fields and contexts, like in the field of *Organizational Behavior*, *Marketing*, and *Information Systems (IS)*, especially in the context of *Human Computer Interaction (HCI)*. Due to the interdisciplinary character of crowdsourcing and the diverse roles of crowdsourcees (e.g., a platform-mediated worker, community member, or consumer and influencer), different perspectives of *engagement* seem suitable.

- First, from an *IS-perspective*, user engagement is defined as a situational or enduring emotional, cognitive and behavioral connection between a user and a (technological)

resource (Attfield, Kazai, Lalmas, & Piwowski, 2011), based on a user experience that extends beyond pure usability (O'Brien & Toms, 2008). A vague description of the user engagement process is offered, consisting of a point of engagement, a period of sustained engagement, disengagement, and (possibly) reengagement (O'Brien & Toms, 2008). Behavioral responses (e.g., technology use, length, return) can be observed through interaction patterns (Attfield et al., 2011).

- Second, *employee or work engagement* commonly refers to a psychological state that is above and beyond simple satisfaction, as well as a behavioral response that includes, e.g., innovative behaviors, proactive contribution, and over-fulfillment of task (Macey & Schneider, 2008).
- Third, *community engagement* discusses the identification and interaction of community members within the group (Algesheimer, Dholakia, & Herrmann, 2005). Brodie, Ilic, Juric, and Hollebeek (2013) identified learning, sharing, advocating, socializing and co-developing as relevant behavioral sub-processes.
- Fourth, the concept of *consumer engagement* is defined as a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent (Brodie, Hollebeek, Juric, & Ilic, 2011), usually followed by behavioral responses in form of referral or consumption (Kumar et al., 2010; Van Doorn et al., 2010). In this context, customer experience is related to the internal, subjective perception of interactions throughout the customer journey (Johnston & Kong, 2011).
- Lastly, in the context of *service research*, Storbacka et al. (2016) conceptualize engagement very broadly as “an actor’s disposition to engage as well as the activity of engaging in an interactive process of resource integration within the institutional context, provided by a service ecosystem” (p.3009). They further explain that engagement “is based on an actor’s present-day connections that have emerged from past service experiences and are oriented toward future service experiences” (p. 3013). As engagement occurs within shared institutional logics, Storbacka et al. (2016) propose that it is not only a result of actor-specific characteristics, but that the conceptual and physical (or virtual) environment pre-dominantly determines why, when and how actors engage. This environment is also referred to as the engagement platform, consisting of physical or virtual touchpoints that support the exchange and integration of resources (Breibach, Brodie, & Hollebeek, 2014).

Although those definitions differ in terms of the *engagement object* (i.e., a resource/technology, an employer, a community, a company or an actor) and *resulting behavior* (i.e., use, contribute, interact or consume) the underlying understanding of engagement is very similar, considering a psychological and a behavioral component and assuming different levels of engagement that are dependent on perceived experiences

Hence, generally spoken, *engagement* can be defined as a dynamic, iterative process by which a specific type of psychological state develops over time among engagement subjects (i.e., an individual), resulting in behavioral responses that can be seen as value-contributions

for the engagement object (e.g., a company). Despite of its potentially dynamic nature, the psychological end-state is regarded as a relatively pervasive and persistent (Wefald & Downey, 2009), positive affective-cognitive (Hollebeek, 2011) state of mind. This psychological state encompasses various combinations of cognitive, emotional, and behavioral dimensions, dependent on perceived stimuli and prior experiences (Brodie et al., 2013; Hollebeek, 2011; Kahn, 1990).

In the subsequent section each part of the here mentioned *engagement process* is assessed in more detail and relevant literature reviewed to present a conceptual model of the end-to-end process that serves as the research foundation for all empirical studies, presented in this thesis.

Engagement [Working Definition]: a dynamic, iterative process by which a specific type of psychological state develops over time among engagement subjects (i.e., an individual), resulting in behavioral responses that can be seen as value-contributions for the engagement object (e.g., a company). The psychological end-state is regarded as a relatively pervasive and persistent, positive affective-cognitive state of mind that encompasses various combinations of cognitive, emotional, and behavioral dimensions, dependent on perceived stimuli and prior experiences.

2.3 The Process of Engagement

Based on the above mentioned working definition of *engagement* and an extended literature review that will provide more details, a guiding model of the *engagement process* is developed (see Figure 4), which was originally published in a modified version in the BISE Journal (Troll et al., 2018). It illustrates engagement formation in the form of a four-step process model from a subject's perspective.

In the first step, perceived interaction points, so-called stimuli, as well as prior experiences (in terms of familiarity with the engagement object) and initial involvement states serve as *input factors* (A). In a second step, experienced stimuli are processed via different experience dimensions depending on their intensity, resulting in several intermediate states that are referred to as *satisfaction responses* and *behavioral responses* (B). The sum of all intermediate experience evaluations result in a desirable final psychological engagement end-state, defined as a *commitment state* (C), accompanied by *engagement behaviors* that represent the overall level of engagement (D) as process outcomes. Each step is elaborated and grounded in substantial theory in the following section.

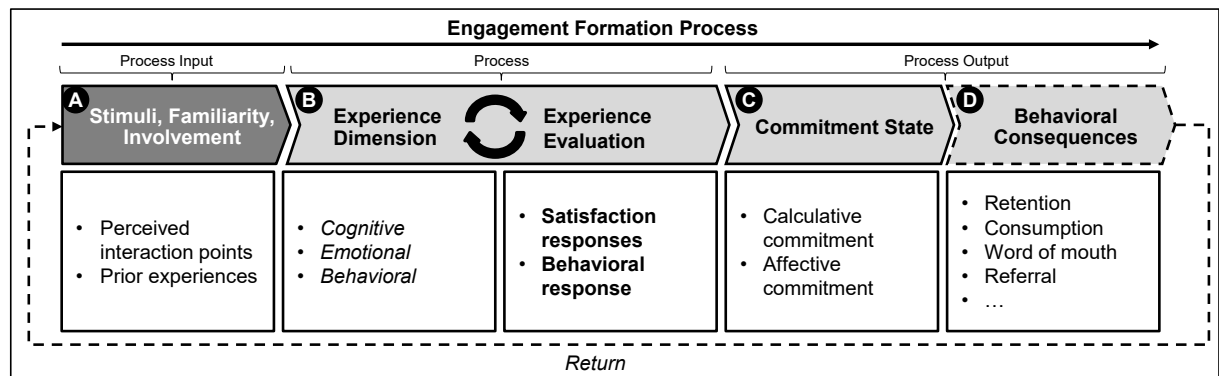


Figure 4. Conceptualization of the Engagement Process

Source: adapted from Troll, Blohm, and Leimeister (2018)

Process Step A

Based on the logic of the model of Kano, Seraku, Takahashi, and Tsuji (1984), it is assumed that perceived stimuli can take on different roles within the subsequent process of engagement, depending on their categorization from an attribute-perspective (see Figure 5 for an illustration).

The model, rooted in the fields of marketing and product lifecycle management, is used to explain in how far product or service attributes (here referred to as stimuli) may lead to different satisfaction levels, depending on a subject experience perception and related expectations (Chen & Chuang, 2008). Kano et al. (1984) define three different types of attributes:

- Firstly, they suggest that some attributes, often called *differentiating attributes*, are explicitly demanded by the subject and that satisfaction is assumed to be proportional to the level of fulfillment. That means the higher the level of fulfillment (i.e., beyond expectations), the higher the subject's satisfaction and vice versa.
- Secondly, they advocate that so-called *attractive attributes* have the potential to lead to very high satisfaction as they are neither explicitly expressed nor expected by the subject.
- Lastly, they introduce the basic requirements that are simply needed for a product or service to perform. Those *basic attributes* have the potential to only foster a state of fulfillment or dissatisfaction (i.e., no over-fulfillment is possible), as their performance is simply taken for granted and clear expectations exist. However, no over-fulfillment of those attributes can be expected.

Consequently, from a high level view, all perceived stimuli that serve as potential input factors in the process of engagement can be related to one of those attribute-categories, initiating a specific level of satisfaction-generation. Besides, it is also assumed that prior experiences with those (or similar) stimuli and the engagement object influence experience evaluations, as familiarity is strongly related to the expectations that a subject has towards a specific attribute (Bowden, 2009). Based on familiarity with an engagement object, trust-

relationships can develop which are assumed to influence future stimuli perception and engagement formation (Bowden, 2009; Sashi, 2012). Hence, familiarity as a relevant input factor is also added to the process model. Additionally, initial involvement (i.e., a subject's personal interest, relevance, or value of something), may be the reason for a subject to initially engage with an object (Oliva, Oliver, & Bearden, 1995). It is supposed to influence judgements throughout the interaction process. In the next process step, satisfaction generation as a substantial part of the engagement process is assessed and outlined in more detail.

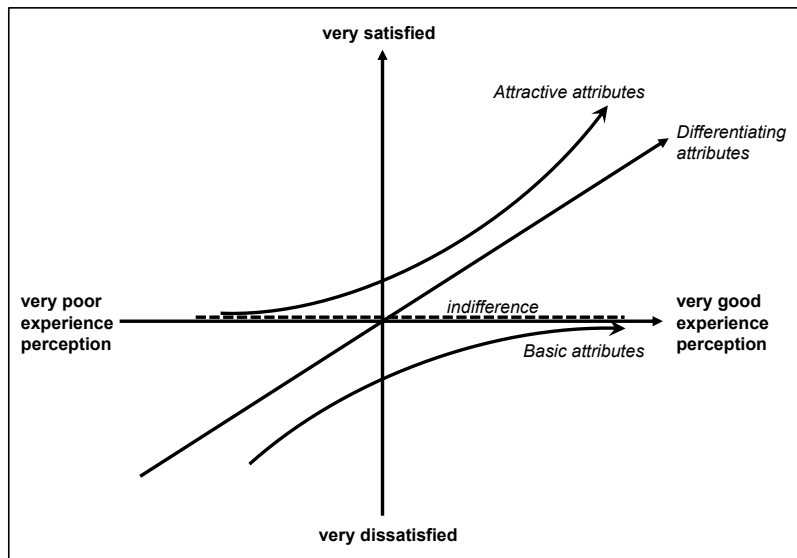


Figure 5. Illustration of the Kano Model

Source: Kano et al. (1984)

Process Step B

Within the multidimensional perspective of engagement, researchers agree on the observation that the processing of stimuli has a *cognitive, emotional and behavioral* dimension (Brodie et al., 2013; Hollebeek, 2011; Kahn, 1990). The *cognitive dimension* can be interpreted as a more passive state of immersion and absorption (e.g., being focused and stimulated) (Hollebeek, 2011; Hollebeek, Glynn, & Brodie, 2014) or a more active state of cognitive processing to expedite comprehension (e.g., reasoning, learning or decision making) (Mollen & Wilson, 2010). The *emotional dimension* relates to the feelings, activated by an experience (e.g., happiness). Based on the cognitive and emotional perception, a *behavioral response* towards a specific stimulus may be expressed within the process.

Addressed dimensions regarding a perceived stimulus are assumed to be evaluated by the subject, and an intermediate state is generated, happening unconsciously (Bowden, 2009; Sashi, 2012). As already suggested by Kano et al. (1984), such an intermediate state can be defined as a specific *satisfaction level*, which may change with each subsequent stimulus experience (Oliver, 1993; Verhoef, 2003). In addition to that, the *behavioral response* can

be understood as the behavioral manifestation of the level of engagement at that stage (i.e., an observable and measurable short-term measure for engagement).

From the consumer and organizational behavior literature, *satisfaction* is generally known as a factor influencing loyalty behavior and thus creates additional value for the firm (Abraham, 2012; Hallowell, 1996). While several researchers agree on its relevance within the engagement process, like Bowden (2009), Hollebeek (2011), Sashi (2012), and Wefald and Downey (2009), they question its sufficiency and assume that other, stronger mechanisms are operating, such as the concept of delight. However, this depends on the choice of the satisfaction definition that is used, as several have appeared in the past years. Some of them are unidimensional, based on a solely cognitive evaluation as proposed by the famous *expectancy disconfirmation model* (Oliver, 1980), on which also the Kano-model builds.

Yet, the *concept of satisfaction* applied in this paper is a more modern and comprehensive one that allows for differentiating between more *levels of satisfaction* which are relevant for truly understanding the engagement formation process. It is a function of both, cognition and affect, as suggested by *the two-appraisal model* of Oliver and De Sarbo (1989). Based on their model, cognitively perceived disconfirmation between an expectation and perception may lead to positive or negative emotional arousal as a satisfaction response to the experience. Generally, three categories of events can be differentiated:

- (a) *Perceptions in a confirmation region*, in which deviations from expectations are considered normal, without any emotional arousal.
- (b) *Plausible but infrequent disconfirming perceptions* that are noted as unusual, arousing some emotions.
- (c) *Highly unexpected deviations*, evoking disconfirmation and high emotional arousal due to surprise (Oliver & De Sarbo, 1989; Oliver, Rust, & Varki, 1997). However, even without expectation disconfirmation, low to high emotional arousal may occur, e.g., if an experience is novel and no clear expectations exist (i.e., an expected unexpectedness) (Oliver & De Sarbo, 1989).

In this context, Briggs, Reinig, and de Vreede (2008) offer a finer grained definition of the *satisfaction response* in an IS-context. They describe it as a *valenced affective arousal continuum*, reaching from not-aroused to aroused, and the valence characterizes the level of arousal as positive or negative, while not-aroused describes a neutral, rather cognitive state. A switch of valence from positive to negative (or vice versa) may occur without passing the neutral state (Briggs et al., 2008). This is a relevant insight for the process perspective of engagement, in which several stimuli throughout an interaction journey are perceived and evaluated consecutively. Thus, individual satisfaction responses may not be explained independently but relate to preceding ones, while high emotional arousal may have a dominant impact on the overall experience evaluation and the end-state. An illustration of the emotional arousal continuum is presented in Figure 6, based on the descriptions of

Briggs et al. (2008), extended by the means of the specific satisfaction levels and terms from Mano and Oliver (1993) and Oliver and Swan (1989).

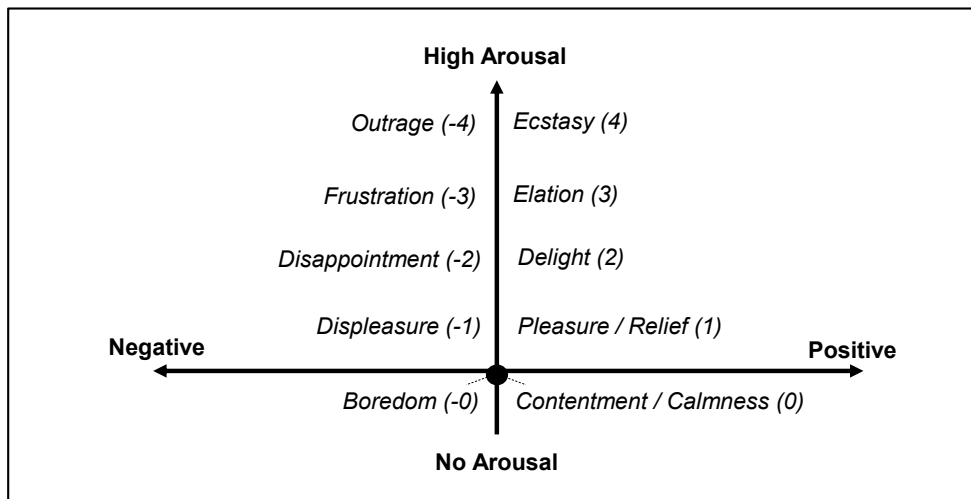


Figure 6. Illustration of the Emotional Arousal Continuum

Source: Adapted from Briggs et al. (2008)

The five ascending types of positively (i.e., *contentment, pleasure, delight, elation, ecstasy*) and negatively (i.e., *boredom, displeasure, disappointment, frustration, outrage*) valenced satisfaction responses are used for the detailed assessment in later sections, for which reason they are numbered here.

Consequently, combining the multi-dimensional logic of the *satisfaction concept* with the *emotional arousal continuum* offers a suitable tool for assessing the satisfaction responses within the engagement process and for identifying the role of specific stimuli.

Process Step C & D

The *satisfaction response* in this context is not defined as an end in itself but rather seen as an intermediate step towards the desired engagement end state. The end state can be described as *commitment* towards the engagement object or what is in the interest of the engagement state (e.g., a product, service or task), which fits the description of a *persistent, affective-cognitive state of mind* as it was described in the initial working definition of engagement (Hollebeek, 2011; Wefald & Downey, 2009).

The relationship between *satisfaction* and *commitment* is empirically confirmed by several authors (e.g., Gustafsson et al. 2005; Verhoef 2003; Schulten and Schaefer 2015) and also conceptualized in first models of the engagement process (e.g., Bowden, 2009; Brodie et al., 2011; Macey & Schneider, 2008; Sashi, 2012; Wefald & Downey, 2009). While *satisfaction* is a backward-looking (nondurable) evaluation of a stimulus' perception, the resulting *commitment* dimension is more a forward-looking (durable) state of mind, by which an individual has the desire to maintain a relationship with an engagement object (Gustafsson, Johnson, & Roos, 2005). It is associated with a specific attitudinal position, which may be of a more rational or emotional character. *Calculative commitment* is the

rational or economically based dependence on an object's benefits due to perceived utility, switching costs or a lack of alternatives that fosters return and consumption intentions and behaviors (Gustafsson et al., 2005). *Affective commitment* refers to an emotional state that expresses a subject's psychological closeness to a focal agent and is related to the willingness to refer and use word of mouth (Gustafsson et al., 2005). It is expressed as a holistic or aggregate judgment of an engagement object, independent from its functional attributes, but rather based on aroused emotions. As mentioned before, prior familiarity and access to more information may foster the development of affective commitment. Affective commitment can be seen as the stronger and more sustainable form of commitment as it goes beyond rational means. Affectively committed subjects are more forgiving in case of negative experiences more attentive and loyal in general (Schulten & Schaefer, 2015).

Nevertheless, when both forms of commitment develop, it is assumed that the engagement subject and object are in an *enduring relational exchange* with strong emotional bonds (Sashi, 2012). This desired psychological engagement state is related to direct responses (e.g., return) as well as indirect behavioral value contributions (e.g., referral) towards the engagement object (Bowden, 2009; Sashi, 2012).

Engagement Process [Refined Working Definition]: In the first step, stimuli, familiarity with the engagement object, and initial involvement states serve as input factors (A). In a second step, experienced stimuli are processed via different experience dimensions, resulting in several intermediate states that are referred to as satisfaction responses and behavioral responses (B). The sum of all intermediate experience evaluations result in a desirable final psychological engagement end-state, defined as a commitment state (C), accompanied by engagement behaviors that represent the overall level of engagement (D) as process outcomes.

2.4 Applying the Concept of Engagement to the Field of Crowdsourcing

Independent of the crowdsourcer's original intention, performing a crowdsourcing initiative creates an *experience* that may foster *engagement* among crowdsourcees. The *crowdsourcing experience* is defined as a crowdsourcee's internal and subjective perception of the end-to-end IT-mediated *Crowdsourcing Journey*, consisting of a series of stimuli, and resulting in a psychological state. It is mainly an online experience, driven by several interaction points (stimuli) over one or more virtual channels. The *crowdsourcing journey* is a simplified illustration of the three phases, which a crowdsourcee goes through:

- (1) The *pre-participation phase*, in which the crowdsourcing initiative is discovered via some channel, information is collected, and finally a decision to participate is made.

- (2) The *participation phase*, in which the task (being crowdsourced) is approached, an object of interest discovered (e.g., a product to be tested or co-developed), and interactions are experienced.
- (3) The post-participation phase, in which the concluding communication and the compensation (monetary or non-monetary) takes place.

With repeated interaction, crowdsourcees reiterate the process. The crowdsourcing journey framework, which was originally published in a modified version in the Proceedings of the International Conference on Information Systems 2016 (Troll et al., 2016), serves to systematically identify and cluster all stimuli that possibly can be perceived by the crowd and that impact their impressions (i.e., psychological mechanisms) and behaviors (Figure 7). Due to its participative character, the underlying assumption is that crowdsourcing generally has the potential to generate high levels of engagement. Depending on the set up, crowdsourcees (i.e., the engagement subject) may engage with the crowdsourcer directly or via an intermediary (i.e., the engagement objects). They can have varying degrees of familiarity concerning the objects (e.g., prior crowdsourcing or customer experiences), influencing their expectations and experience evaluation.

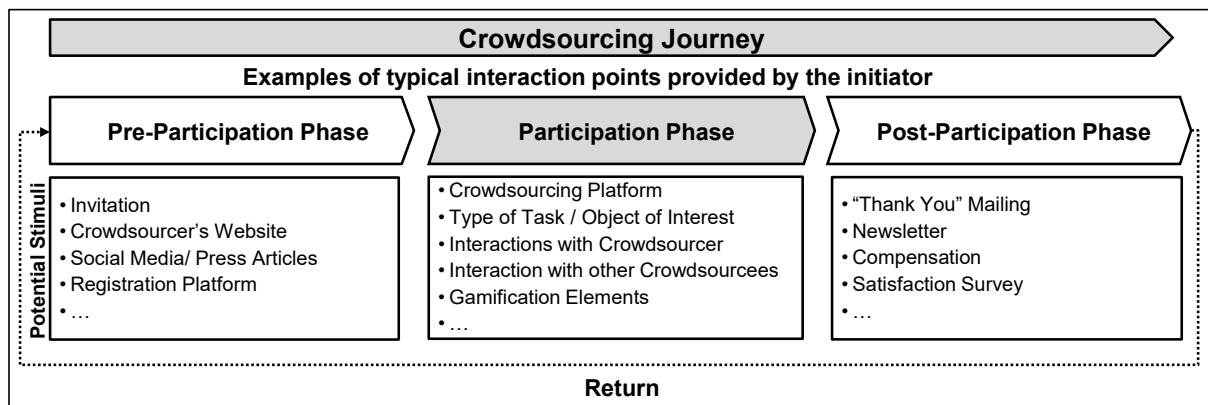


Figure 7. Crowdsourcing Journey

Source: adapted from Troll, Blohm, and Leimeister (2016)

Henceforth, *crowdsourcing engagement* is conceptualized as a process that leads to short and long-term activities due to satisfying experiences that aggregate into a commitment state over repeated interactions. It is not defined as an end-state by itself but rather a psychological state of different intensity levels that changes over time and that can be observed and measured based on the activities that crowdsourcees directly devote to the crowdsourcing platform (e.g., contributions) and that indirectly create sustained value for the crowdsourcer (e.g., consumption and positive word of mouth). Specific experiences are supposed to dominantly impact the engagement process. The relationship between the *crowdsourcing experience* and *engagement* was first illustrated in an article, published in the Proceedings of the Wirtschaftsinformatik (Troll et al., 2017).

First, referring to **step A and B** in the process model, the *cognitive and emotional dimension* can be addressed due to a diverse range of potentially attractive and differentiating attributes, leading to different *satisfaction response levels*.

- From an *IS-perspective*, a system's attributes like novelty, variety, aesthetics (affective or sensory appeal), and fun have the potential to arouse medium to high levels of emotions (Attfield et al., 2011; O'Brien & Toms, 2008). In the crowdsourcing context this could be referred to an attractive and fun-providing crowdsourcing platform.
- In addition, the *organizational behavior literature* discusses some task attributes (e.g., entertaining or challenging), a subject's identification with it (e.g., good skill-task fit), and specific rewards (e.g., unexpected) as potential generators of positive affect (Macey & Schneider, 2008). This may relate to a fun-providing task or a surprise benefit (e.g., a gift, status upgrade) in the crowdsourcing context.
- Moreover, according to *community research*, interaction with the crowd may stimulate a sense of group belonging that is known to foster intense positive feelings (Algesheimer et al., 2005).
- Lastly, from *consumer behavior* and *service research* it is known that personal and close interactions between buyers and sellers (e.g., in co-creative set ups) can have a positive effect on demand and word of mouth, due to the buyers' desire for recognition and appreciation (Mustak, Jaakkola, & Halinen, 2013). This may be transferred to crowdsourcer-to-crowd interaction throughout the task-solving process (e.g., compliment, query, or support), resulting in positive arousal or relief.

Based on the stimuli-experiences, *short-term behavior* may be triggered, which can be observed and measured in form of crowdsourcee's activities devoted to the crowdsourcing platform. Nguyen et al. (2015) suggest that in crowdsourcing projects, the magnitude (i.e., number of activities), diversity (i.e., types of activities), and temporal intensity (i.e., the sustained nature of activities) of measurable effort devoted to a requested crowdsourcing task signals the level of engagement among crowdsourcees. The magnitude indicator can be understood as the total number of activities that someone devotes to a crowdsourcing platform as well as the individual effort that someone puts into an activity itself, like for example the contribution length in terms of its number of words or characters used. A high *level of engagement* is assumed, when e.g., more, diverse, short and long-term consumer activities are observed, whereas all kind of possible platform activities are accounted for.

Subsequently, referring to **step C** in the process model, a state of *calculative commitment* may develop if a clear utility of participation is seen. This can be understood as a rational reason for participating again in an initiative from the crowdsourcer to gain the benefit that was perceived in the first place. Additionally, a state of *affective commitment* may develop when emotional arousal has been generated. This can be understood as an emotional attachment to the crowdsourcer directly.

Lastly, resulting *direct and indirect behavioral value contributions* in the post-participation phase (**step D**) can be understood as indicators of the overall engagement level that a crowdsourcee reached at the end of the journey. Those engagement behaviors can refer to repeated crowdsourcing participation, virtual or direct word of mouth (e.g., talking positively about the crowdsourcer and the project), referral behavior (e.g., inviting friends to join the initiative), and consumption activities (e.g., buying or using something from the crowdsourcer). Those behaviors are assumed to be dependent on the type of commitment state that was formed. The more of them can be observed or are intended (based on self-reported data), the higher the overall engagement level can be assumed.

In a next step, it needs to be investigated, which stimuli-related experiences play a major role in the engagement formation process and which satisfaction responses can be triggered.

Crowdsourcing Experience [Working Definition]: A crowdsourcee's internal and subjective perception of the end-to-end IT-mediated Crowdsourcing Journey, consisting of a series of stimuli, and resulting in a psychological state.

Crowdsourcing Engagement [Working Definition]: A process that leads to short and long-term activities due to satisfying experiences that aggregate into a commitment state over repeated interactions. It is not defined as an end-state by itself but rather a psychological state of different intensity levels that changes over time and that can be observed and measured based on the activities that crowdsourcees directly devote to the crowdsourcing platform and that indirectly create sustained value for the crowdsourcer.

Chapter III

Theory Development with Empirical Data

*Anatomy of an Engaging Crowdsourcing
Experience - A Process Theory*

3 Anatomy of an Engaging Crowdsourcing Experience - Towards a Process Theory

This Chapter provides insights from the multiple case study based on the crowdsourcing journey blueprint as a response to research question two. As a key finding, four stimuli groups are presented, which were found to play different roles within crowdsourcers' engagement processes. The chapter concludes by providing generalized engagement formation propositions and an enriched process model.

This Chapter builds on the following publications²:

Troll, J., & Blohm, I. (2017). How Does the Crowdsourcing Experience Impact Participants' Engagement? An Empirical Illustration. In: *Wirtschaftsinformatik (WI 2017)*, St. Gallen, Switzerland.

Troll, J., Blohm, I., & Leimeister, J. M. (2018). Why Incorporating a Platform-Intermediary can Increase Crowdsourcers' Engagement. In: *Business & Information Systems Engineering (BISE Journal)*, 1-18.

² Selected sections from the here mentioned publications have informed this chapter. A significant amount of new content and data was added for the purpose of this monograph. While the here mentioned publications are based on a single case and two-case study, findings in this chapter are based on a multi-case study (four new cases). References provided where applicable (see text).

3.1 Introduction

First authors recognized the need for a more experienced-based perspective on crowdsourcing (Füller et al., 2009; Pedersen et al., 2013; Vuković, 2009). As the assessment of the research gap showed (Chapter 1.3), no existing study takes a process perspective to systematically assess the crowdsourcee's end-to-end experience. Yet, this is necessary to understand how and why crowdsourcees engage throughout their IT-mediated crowdsourcing journey.

Chapter 2 set the foundation for the concept of the *crowdsourcing experience* as an overall driver of *crowdsourcing engagement* and the *crowdsourcing journey* as a more tangible process model that can be used to break down the uber-experience into sub-experiences related to specific interaction points. In a next step, those slightly abstract concepts and models need to be enriched with empirical data to derive key insights on their relationships to each other. To fill these gaps, a multiple case study approach is employed and propositions for a process theory of the crowdsourcees' engagement process developed in order to answer the following research question:

How does the Crowdsourcing Experience impact the engagement process throughout the crowdsourcing journey?

The goal is to first derive a crowdsourcing journey blueprint that includes all perceivable interaction points that may affect the crowdsourcing experience. This blueprint needs to be as generic as possible to allow a mapping of crowdsourcees who participated in different types of crowdsourcing projects to make their *crowdsourcing experiences* comparable. For this purpose interviews and focus group discussions with members of the *Crowdsourcing Consortium* were conducted. In a second step, collected interview and platform data from crowdsourcees out of four common crowdsourcing cases from different industries, provided by the consortium, with slightly different set-ups (e.g., in terms of the reward, collaboration and platform management) serve as a base for this study. All projects focus on the general task of crowdtesting with the goal to improve new digital services together with the crowdsourcee. An adapted form of the interview approach called "sequential incident laddering technique" (SILT) (Jüttner, Schaffner, Windler, & Maklan, 2013) is applied to establish the link between perceived stimuli and crowdsourcee's satisfaction responses and commitment states.

This study extends existing knowledge by offering researchers a process perspective on engagement and exploring the underlying mechanisms and stimuli-characteristics that foster value creation in different crowdsourcing settings. As a result, four stimuli groups are identified with different potentials to form cognitive-affective intermediate states that dominantly affect commitment formation throughout the *crowdsourcing engagement process*. To the best knowledge of the author of this thesis, the engagement process was not assessed in the field of crowdsourcing in such a detail and no particular research approach such as the SILT method was used before. Apart from the theoretical relevance of studying

mediated engagement processes and explaining voluntary use and participation in a socio-technical system, findings support decisions on how to effectively design engaging *crowdsourcing journeys*.

This study aims to:

- (1) Understand *common interaction points* that crowdsourcees potentially experience throughout their *crowdsourcing journey* and develop a *blueprint* for collecting and structuring data.
- (2) Explore data from 30 interviews with crowdsourcees from four projects to identify *satisfaction* and *behavioral responses* that dominantly affect *commitment* formation and engagement *behaviors* after participation.
- (3) Identify *dominant patterns* across cases and propose *stimuli groups* with different roles throughout the engagement process.
- (4) Provide an enriched model of *the engagement formation process*.

3.2 Methodology

Each crowdsourcing initiative can offer crowdsourcees a unique IT-mediated interaction process, consisting of many consecutive and somehow interrelated experience-driving stimuli. Moreover, crowdsourcing platforms are socio-technological systems with unclear borders and a number of different roles and actors. Thus, experimental control and manipulation is hard to realize. Beside of that, the state of knowledge concerning the engagement process is still low, while complexity of the research phenomenon is high. Hence, different data sources, providing information about the stimuli along the crowdsourcing journey, perceived experiences of crowdsourcees, and behavioral responses need to be triangulated.

3.2.1 Multiple Case Study

As this research wants to find out “how” and “why” crowdsourcees engage in crowdsourcing projects, a case study approach for illustration and advancement of the conceptualized engagement process seems suitable (Yin, 2013). The goal is to extend knowledge on engagement by identifying relevant cognitive-affective states and associated stimuli characteristics. This refers to an approach by Lee et al. (1999), called “theory elaboration”, in which researchers frame the research within the context of the existing body of knowledge and induce the processes by which variables unfold. A natural setting ensures that findings can be generalized to actual processes. In contrast to quantitative research, in case study research, the generalization of results is not based on principles of statistical inference (Yin, 2013). The theoretical framework serves as a basis for analyzing empirical findings to ensure “analytic generalization” (Yin, 2013).

Moreover, a so called “holistic, multiple-case” study design is chosen (Yin, 2013). Multiple case studies with a single unit of analysis (“holistic”) allow researchers to verify findings within and across cases and improve internal and external validity (Yin, 2013). Additionally, assessing different cases increases the chance to discover more experience patterns that lead to engagement, which would remain undiscovered by looking at only one case. As recommended by Yin (2013) for the replication of findings, the research opts for investigating four typical and comparable crowdsourcing cases from Swiss Companies with slightly differently designed *crowdsourcing journeys* and differently sized consumer crowds. Crowdsourcing cases were selected based on similar task-design and crowd-characteristics (i.e., familiarity with engagement objects, cultural background and income level), but different stimuli characteristics. A summary of the here mentioned quality metrics and how they were considered in this study is presented in Table 2.

Quality metric	Consideration for this study
Construct Validity	More than one data source to verify insights: interviews, observations, platform data.
Internal Validity	Comparison of crowdsourcees’ potential engagement processes. Crowd-selection based on similar characteristics (homogeneous).
External Validity	Theoretical framework of the engagement process serves as base (analytical generalization). Replication through multiple case study approach.
Reliability	Consistent coding scheme applied to all sources of data (interview recordings; transcripts; project documentations; platform data) Intercoder reliability: four independent coders that first individually and then collaboratively assessed and coded case data

Table 2. *Validity and Reliability of Selected Case Study Approach*

3.2.2 Case Selection

Out of the Consortium of the *Competence Center Crowdsourcing* (University of St.Gallen), four partners with running crowdsourcing projects were identified, in which a relatively homogeneous end-user crowd was asked to test and explore a digital product and to provide feedback on a crowdsourcing platform. Stimuli characteristics were slightly differently designed e.g., in terms of platform design and management, initiative duration, compensation, and amount of interaction with the crowd. Hence, different experiences were created that may have led to different engagement outcomes.

Selected crowdsourcing projects illustrate common cases and incorporate all characteristics of crowdsourcing as was proposed in Chapter two: 1) a concrete task proposed via an open call; 2) a virtual platform for feedback submission and interaction; 3) voluntary participation; 4) clearly defined forms of benefits that can be expected at the beginning of

the project; and 5) a clearly defined and announced crowdsourcer (also in the case of intermediated-projects).

All cases can be placed in the field of crowdtesting (i.e., crowdsourced software-testing) and the goal to test and improve a digital service together with an end-users crowd, which is a relatively new and growing area (Leicht et al., 2017). All four companies were somehow familiar with those projects, i.e. it was not their very first crowdsourcing initiative that they have launched. Hence, it is expected that exceptional problems, unusually influencing the *crowdsourcing experience*, could be reduced.

In Table 3, an overview of the characteristics of the four cases in terms of the type of 1) crowd, 2) incentive, 3) task, 4) object of interest in the center of the task, 5) collaboration among crowdsourcees, 6) interaction with the crowdsourcer, and 7) management of the platform (i.e., via an intermediary or self-management) is provided. Company names were changed but give an idea of the industry they are operating in: InsureCorp, RetailCorp, MobilityCorp, and TelcoCorp.

All four cases have an end-user crowd with similar characteristics i.e., crowdsourcees are somewhat familiar with crowdsourcer and crowdsourcing and have the same cultural background and are in a similar income class. Crowdsourcees, who were selected for the study fell into the category of average income according to the Federal Statistical Office (i.e., not less than USD 62,283 per year). While case one and four took advantage of an intermediary, who provides the platform and manages all administrative processes like crowd acquisition, onboarding and payment of a monetary reward; case two and three decided to build and manage their own crowdsourcing platforms as well as acquiring their own crowd that was incentivized with a gift voucher or via gamification. Case one asked the crowd to explore a new website and provided scenarios to put participants in the situation of insurance seekers. In case two, different website designs were provided and the crowd was asked to vote for their preferred option and to answer a couple of questions. In case three and four, the crowd was asked to (beta-) test and explore an app in real situations and report bugs, ideas for improvements as well as vote or comment on contributions from others. In all four cases, the crowd was able to interact with other crowdsourcees and the crowdsourcer. Additionally, the crowdsourcer was able to proactively interact with the crowd (also in mediated platform settings).

A more detailed description of each case as well as some background knowledge about the four crowdsourcers is provided in the next chapter, where findings from the experience analysis and engagement assessment are presented for each case.

	Case A: InsureCorp	Case B: RetailCorp	Case C: MobilityCorp	Case D: TelcoCorp
Crowd	familiar with crowdsourcer and crowdsourcing (participated in 1-7 prior projects); end-users / consumers; same cultural background (living in Switzerland for more than 10 years); similar income level (mid-level)			
Incentive	Monetary reward (set at the beginning of the project)	Gift voucher (set at the beginning of the project)	Gamification (badges can be earned based on quantity of contributions)	Monetary reward (set at the beginning of the project)
Task	Structured test cases with scenarios: think aloud videos and survey	Compare designs: vote for preferred option and structured survey	Beta-testing: explore an app (personal use case), submit bugs, ideas, vote and comment on ideas of others	Beta-testing: explore an app (personal use case), submit bugs, ideas, performance issues, satisfaction survey
Object	Website	Website	App	App
Collaboration	No collaboration needed for task, contributions cannot be seen and commented	No collaboration needed for task, contributions cannot be seen and commented	Collaboration optional, contributions can be seen and commented	No collaboration needed for task, contributions can be seen and commented
Crowd-to-crowd interaction	Crowd can talk via discussion board (to discuss general questions or concerns)	Crowd can talk via discussion board (to discuss general questions or concerns)	Crowd can talk publicly via platform (commenting function) and privately via a messenger	Crowd can talk via discussion board and platform
Crowdsourcer-to-crowd interaction	Possible via chat function on platform, crowdsourcer can contact crowdsourcees	Possible via email / phone, crowdsourcer can contact crowdsourcees	Possible via private chat or in group environment, moderators can contact crowdsourcees	Possible via chat function on platform, crowdsourcer can contact crowdsourcees
Management	Intermediary platform (not branded)	Own improvised platform with additional 3 rd party tools	Own platform set up for this project (branded)	Intermediary platform (not branded)

Table 3. Overview and Characteristics of Selected Crowdsourcing Cases

3.2.3 Data Collection

To ensure construct validity, multiple sources of evidence were chosen (Yin, 2013), including: (1) interviews with crowdsourcing initiators and intermediaries; (2) interviews with crowdsourcees; and (3) crowdsourcing platform data.

For the case assessment, first, to understand the intended experience, semi-structured interviews were conducted with two managers from each crowdsourcer as well as one manager from the intermediary. Based on that, a general blueprint of the crowdsourcing journey with all its potential stimuli from a crowdsourcee's perspective could be visualized for all four cases. This supported the subsequent interview process and ensured that collected data on stimuli were comparable. Those journeys were then jointly discussed and refined with all crowdsourcers and intermediaries throughout a focus group discussion in the context of one of the consortium workshops. The goal was to identify one overarching journey with all its stimuli and potential engagement drivers, based on the expectations of the consortium members.

Secondly, 30 in-depth interviews (60-90 minutes) with crowdsourcees from all four cases were conducted to decipher the crowdsourcees' experiences and associated engagement processes along their individual journeys. Therefore, crowdsourcees were invited for an interview via email or invitations were posted on the platform. Selection was based on comparability of crowdsourcees in terms of familiarity with crowdsourcing (at least one prior project to avoid overly excited, critical or bored crowdsourcees), familiarity with crowdsourcer (actual end-user or consumer), living in Switzerland for more than 10 years (cultural comparability), and with an average income level (that diverges plus/minus 10 percent from the average income in Switzerland). The number of interviewees was selected based on the principle of data saturation in qualitative research, as suggested by Saunders et al. (2018). Saturation in this case means that no additional data was found and more and more similar instances are discovered, so that the researcher became empirically confident that the topic under investigation was saturated. This led in the end to seven or eight interviewed crowdsourcees for each case (30 in total).

Thirdly, inspired by the user and work-engagement-perspective (Attfield et al., 2011; Macey & Schneider, 2008), behavioral platform data was assessed, concerning a) the crowdsourcees' time spent on the platform, b) the length of contributions (word count), c) their level of detail (i.e. under-/ over-fulfillment of tasks) and for some cases d) the number of website or app visits. Additionally, data about demographic information and prior crowdsourcing experiences for each participant could be collected from the platform.

3.2.4 Interview Technique

A slightly adapted version of the novel approach from consumer behavior, called "Sequential Incident Laddering Technique" (SILT), was used (Jüttner et al., 2013). This

method was first introduced and illustrated in an article, published in the Proceedings of the Wirtschaftsinformatik (Troll et al., 2017). This approach integrates two well-established interview techniques: laddering (Reynolds & Gutman, 1988) and the sequential incident technique (SIT) (Stauss & Weinlich, 1997). The SIT is a process-oriented, qualitative interviewing technique, which facilitates the collection of “incidents” (i.e., stimuli within a crowdsourcing journey). Laddering is a technique where a seemingly simple response to a question is pushed by the interviewer to identify subconscious psychological processes.

Respondents were first asked to recall sequentially all perceived stimuli (“incidents”) from their *crowdsourcing journeys* (step A). The crowdsourcing journey blueprint supported the interviewer in guiding the discussion. Subsequently, the interviewer applied the laddering technique and asked simple “what”, “why”, “how” questions (“laddering”) to establish the link between a stimulus and the crowdsourcee’s cognitive, emotional, satisfaction and behavioral response within the process (step B). Lastly, the crowdsourcee’s final commitment (i.e. the engagement state) and (planned) behavioral contribution (step C and D) were captured. As commitment relates to an attitudinal judgment, they were asked to describe their attitude towards the whole initiative and general relationship with the crowdsourcer after participation to receive insights regarding their emotional and rational disposition.

The interviews were transcribed and assessed, together with the other data sources, by means of qualitative content analysis (Gläser & Laudel, 2010; Mayring, 2015). A category system, based on the theoretical framework of the engagement process, was developed and collected data was coded along stimuli:

- (a) perceived experience dimensions (*emotional, cognitive or behavioral*)
- (b) satisfaction response levels according to the negative (*boredom, displeasure, disappointment, frustration, outrage*) and positive (*contentment, pleasure, delight, elation, ecstasy*) emotional arousal states illustrated in Figure 6
- (c) related engagement object (*crowdsourcer or intermediary*), commitment state (*affective, calculative or none*), and (planned) behavior. To avoid a recall bias (Koenig-Lewis & Palmer, 2008) crowdsourcees were interviewed a few days after participation (within two to seven days after their last activity).

Four researchers independently coded the data by allocating direct and indirect statements to the categories (interpretive approach) and subsequently discussed and aligned findings. Data collection was continued until data saturation with regard to each category was achieved, according to all four researchers that were involved in the coding process. The next section provides more context on how the data analysis was conducted.

Figure 8, which was originally published in a modified version in the Proceedings of the Wirtschaftsinformatik (Troll et al., 2017), illustrates the SILT-approach and served, together with the previously visualized crowdsourcing journey, as a structural guidance for the interview.

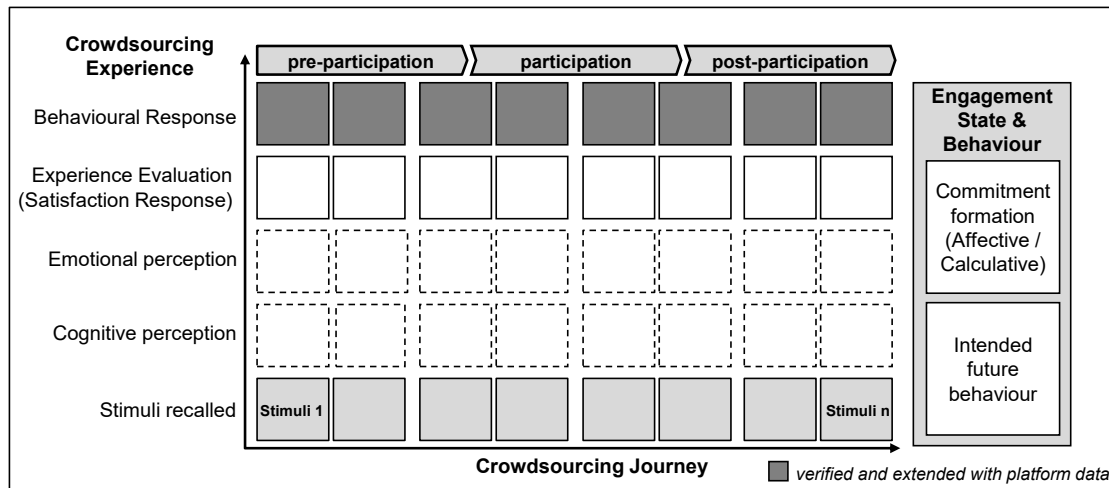


Figure 8. SILT Interview-Approach to Unravel the Crowdsourcing Experience

Source: adapted from Troll and Blohm (2017)

3.2.5 Data Analysis

The overall *crowdsourcing journey framework*, derived from the focus group interviews with crowdsourceers, served to systematically identify and cluster all stimuli that were perceived by the crowd. This relates to the *temporal bracketing strategy*, suggested by Langley (1999). Because mutual influences are difficult to capture, it is recommended to analyze processes in a sequential fashion by temporarily bracketing one of them into phases or periods. This enables the examination of actions in one phase and its effect on another action in a subsequent phase.

Furthermore, according to Langley (1999) and Tsoukas (1989), a solely inductive or deductive approach for elaboration of a process theory is rarely seen. Instead, closing the gap between data and theory can begin at either or both ends and often iterates between them. Inspired from the analytic process of Lewis, Mathiassen, and Rai (2011), by working from the data and moving from specific cases to more general conclusions, a three step approach was chosen for this study:

- First, an inductive analysis was conducted by listening, transcribing, creating memos, coding and discussing the data iteratively among the research team of four. Based on that, inductively derived engagement themes with related characteristics and critical experiences could be identified for all cases.
- Second, by drawing upon individual journeys, a composite narrative of stimuli-related experiences and evaluations along the crowdsourcing journey was constructed.
- Third, a deductive analysis was conducted by using a sense-making strategy to assess the relationships among engagement themes and intermediate experience

evaluations and to structure the data based on the categories of the prior developed engagement process framework and crowdsourcing journey.

The resultant category system was then iteratively adapted throughout the analysis within and across cases. Based on that, patterns of stimuli-related intermediate states and resulting commitment could be assessed.

3.3 Results

3.3.1 Crowdsourcing Journey Blueprint and Consortium's Expectations

In a first step, based on the diverse range of individual crowdsourcing set ups of the consortium partners, a *crowdsourcing journey blueprint* was developed that implied all possible interaction points that crowdsourcees may perceive. In total, nine interaction points that serve as potential stimuli affecting engagement formation, were identified. Figure 9 illustrates the stimuli along the three phases of a crowdsourcing project, from the perspective of a crowdsourcee:

- First, in the pre-participation phase major touchpoints and hence potential experience and engagement drivers relate to the *crowdsourcing invitation* including the open call for participation and the *registration interface*. In the four assessed cases, the invitation was mostly sent in form of an email or posted on a crowdsourcing platform of an intermediary that hosts different types of projects and maintains a large crowd. Other forms of invitation can be call outs on the crowdsourcer's website, via social media channels or press articles. The *registration interface* served as a point for providing relevant data for the crowdsourcer, such as name, origin, job details as well as signing non-disclosure agreements (if needed) and agreeing to the terms and conditions of the initiative.
- Second, in the participation phase the *crowdsourcing platform* itself, the *object of interest* and *task* as well as *interaction points for communicating with the crowdsourcer or other crowdsourcees* were identified as potential stimuli. In the context of the four assessed cases, a support and feedback chat for contacting (or being contacted by) the crowdsourcer as well as a discussion board for *crowd-to-crowd interaction* was identified. In addition, for some cases, direct messaging functions or even commenting functions were provided to foster private and social interaction.
- Third, in the post-participation phase any form of *closing communication* as well as the *provision of the promised compensation* takes place. Here, *closing communication* was provided mostly in form of an email that included a 'thank you' message and sometimes insights on how the project continues and what resulted from it. *Reward* was provided in form of a monetary (e.g., fixed rate) as well as a

non-monetary reward (e.g., gift vouchers and gamification elements like badges that could be earned).

Identified stimuli along the crowdsourcing journey can be either managed solely by the crowdsourcer as the original initiator of the project or (partly) by an intermediary, supporting the crowdsourcer for specific interaction points like platform provision and management, crowd acquisition or compensation. However, even if an intermediary is involved in a project, interaction points like the *crowdsourcing task*, a potential *object of interest* in the center of the task (e.g., a website that needs to be tested or a product that needs to be named or co-designed) or *interaction with the crowdsourcer itself* (e.g., for clarifying questions on the task) needs to be provided and defined by the crowdsourcer.

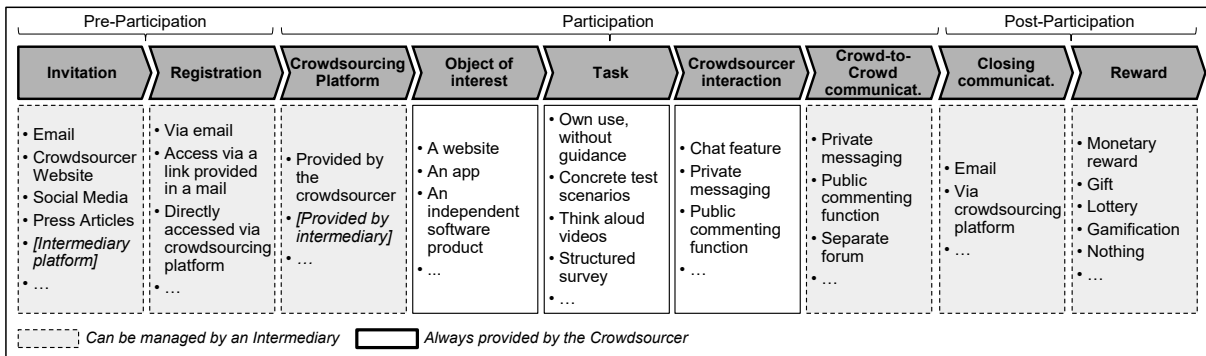


Figure 9. Crowdsourcing Journey Blueprint for Case A, B, C and D

Source: Own Illustration

In a second step, the consortium suggested a few interaction points that they considered as critical with regard to forming or destroying *crowdsourcing engagement*:

- First, the *invitation for participation* was proposed as an important interaction point to win the right crowd and build initial interest and expectations. Appealing design and language was expected to positively impact engagement formation right from the beginning.
- Secondly, the *crowdsourcing platform* itself was suggested as an important engagement driver due to its repeated use and high visibility throughout the crowdsourcing journey. Consortium members assumed that an exceptional design and platform usability makes a difference among crowdsourcers.
- Third, *interaction with the crowdsourcer* and the *platform intermediary* (depending on the set up) was expected to be of high relevance for engagement formation, as they have the power to build a personal relationship with crowdsourcers and keep the participation going.
- Lastly, *monetary incentive* was suggested to be a driver of engagement. A fairly or even above average financial compensation was expected to foster short and long-term engagement responses.

3.3.2 Case A: InsureCorp

In 2015, InsureCorp (name changed), a leading insurance company from Switzerland with around 2 million private and corporate clients and over 4000 employees, decided to renew its digital communication channels with a “mobile first” strategy. To apply a user-centered approach for developing its new mobile web application, InsureCorp conducted three independent crowdsourcing projects, together with a leading Swiss crowdsourcing intermediary. They involved 20 active customers and potential end-users per round, each with a duration of five days. The last project was assessed in this study (May 2016).

The role of the intermediary was to provide a professional crowdsourcing platform for conducting the project, evaluating contributions and preparing a first report of the results for the crowdsourcer as well as being responsible for the crowd acquisition and handling the compensation process. The professional crowdsourcing platform integrated all necessary functions to support the task-solving process, like providing feedback space, a discussion forum and information-wiki. InsureCorp prepared the invitation mailing, in which they provided details about the task, object of interest, and the reward. Responsible project managers from InsureCorp were also available on the platform during the participation phase.

Pre-selected and invited crowdsourcees were offered to test individually the web app’s interface and report on functional bugs, usability, and provide ideas for improvement. They had to go through realistic test scenarios and answer surveys and post so called “think aloud” videos (i.e., recording themselves while exploring the app and solving the task). Hence, a non-collaborative approach with a broad test-scope (whole web-app) was chosen.

InsureCorp could follow the submission process (live) and communicate with crowdsourcees to answer questions and provide feedback via the platform (messenger function and commenting function). A discussion board served as a general platform for questions and discussions among crowdsourcees, e.g. related to the task or platform usability.

In return, crowdsourcees were offered a monetary reward (fixed amount, mentioned in the invitation). As the company developed a certain maturity over iterations, it is expected that in the last one exceptional problems, unusually influencing the *crowdsourcing experience*, could be reduced.

3.3.2.1 Crowdsourcing Experience and Engagement State

Figure 10 gives an overview of perceived stimuli (*process step A*) and presents vertically the cognitive, emotional, related satisfaction and behavioral responses (*process step B*) from the seven interviewed crowdsourcees of InsureCorp. Captured responses regarding the final commitment states are not shown in the figure (due to space issues) but are elaborated in detail in the upcoming sections.

Satisfaction Responses

All previously identified stimuli were perceived and mostly experienced by interviewees (with a few exceptions for the discussion forum), shaping their *crowdsourcing experience*.

79 percent of the stimuli-evaluations resulted in a neutral or positive intermediate state. 29 percent even resulted in a low to high (1-3) positive arousal state that can be described as pleasant, delighted or elated. Looking at the self-reported commitment states and (intended) behavior, it can be assumed that different engagement states among crowdsourcers developed and not all reached a desired affective commitment state (but only 57 percent). A more in-depth analysis of the underlying processes was necessary to identify mechanisms that caused different psychological and behavioral engagement outcomes.

- More specifically, the ***invitation*** (sent via email with personal address directly to crowdsourcer) led only to positive or neutral states. *Pleasant states* were aroused due to positive feelings towards the crowdsourcer who was mentioned in the invite as well as *delight states* due to excitement about the task and surprise about the personal and direct contact via mail. *Neutral states* were related to perceived completeness, concreteness and understandability of information and the mentioned reward.

Pleasant	A4: “nice company, really cool to contribute”
Delight	A2: “I was surprised about the think-aloud videos, I never had this. (...) I felt excited to try that out!” A6: “It was different to the standardized invitation mailings, more personal and sent from a real person”
Content	A1: “Enough information for me.”

- Contrarily, the ***registration and platform interface*** only led to neutral or even negative states. *Displeasure* or even *disappointment* was aroused due to irritations from the requested type of data and language issues. Some were *negatively surprised* by the interface design of the platform. On the other hand, perceived understandability, ease of use, speed of completion and general platform usability and functionalities led to *neutral states*.

Content	A7: “Registration was quickly done. No problem. The site is easy to use and provides everything I need to work on it.”
Displeasure	A2: “Why do they need so much information from me? I just want to help fixing their bugs.”

Disappointment	A4: “It’s really a pity that no one invests time in building a nice platform, when so many people spend hours on it. It hurts my eyes”
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- The *object of interest* (i.e., the website) led mainly to *pleasant states* due to its maturity and coverage as well as to *delight states* due to its perceived relevance (core online service page) and surprisingly novel design, functions and features. The behavioral data collected from the platform showed that emotionally aroused crowdsourcers spent also more time with the test object (more than 40 minutes) in comparison to the less aroused ones (less than 40 minutes).

Content	A5: “Was easy accessible via a link.”
Pleasant	A6: “It is nice to have so much to feedback on.”
Delight	A4: “I didn’t expect to test such a cool, new product idea. I hope they launch it soon. (...) Would be really helpful for me.”

- Interestingly, *the task* (i.e., website exploration with realistic case scenarios and preparation of think-aloud videos) covered the whole range of emotions. Feelings of surprise regarding the novelty and explorative type of task as well as stimulation due to the level of challenge and realistic cases led to either states of *delight* or even *elation*, or to *disappointment and frustration*, depending on the valence of arousal. Contribution analysis revealed that more emotionally aroused crowdsourcers did more than was expected in the task (over-fulfillment) and gave more detailed feedback in terms of word count (1.25 to 1.6 time as much), while negatively aroused ones contributed much less.

Content	A4: “Clear instructions, including an out of scope part.”
Delight	A3: “I never did such a scenario style of task. Super fun and finally something different.” A6: “Cool, we could video tape ourselves instead of writing everything down. Made it much faster and less boring than usual.”
Elate	A2: “... they put us on a motorbike trip and let us experience different scenarios, mentally, where we needed to use the website and solve problems. I really got into it. I loved this! I totally forgot the time, while testing.”
Disappointed	A5: “I thought, this would be same as always, quick bug test. But this was not clear it all. I didn’t know what to do

	and if I knew that before I wouldn't have started ”
Frustrated	A1: “This was really frustrating for me as I didn't know how to handle everything. I had to hold my phone and film me, while reading the scenario and finding a silly phone number.”

- The **interaction with the crowdsourcer via the support chat** aroused *pleasure, relief or simple contentment*, depending on the speed of response and perceived friendliness of staff.

Content	A7: “They sent me a short description of what I had to do. This was what I expected from [InsureCorp]”
Pleased/ relieved	A4: “It was nice to get to know some people behind the scenes” A6: “I felt better, when they replied a few minutes later and got me back on track.”

- The **interaction with crowdsourcees via the discussion forum** was more cognitively evaluated and led to *content-* or even slightly *bored states*. *Displeasure* was aroused when discussion with other crowdsourcees did not lead to satisfying outcomes.

Content	A6: “It makes sense to check it from time to time. Once I couldn't access the website and I saw in the discussion board that others had the same issue.”
Boredom	A7: “Nothing special. Very low interaction, rather boring”
Displeasure	A5: “I was hoping to find someone who had the same issue and who would help me but instead I only got dumb comments that didn't help me at all”

- The **closing communication** (received after submission of all the feedback) resulted in a diverse spectrum of states, ranging from *displeased, pleased to neutral states*, depending on the perceived tonality, fairness of treatment throughout the process and understandability of payment instructions.

Content	A3: “It helped that they explained the complications”
Pleased	A2: “I liked that they said ‘thank you’. I put a lot of work into this. In addition to the money we got. It feels better.”
Displeased	A1: “They explained the payment really complicated. I

	don't get why they don't find an easier way"
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- Lastly, ***the reward*** (fixed monetary amount) led mostly to a *neutral state (content)* as expectations were clear (amount was known before participation) and effort perceived as reasonable for all apart from one disappointed interviewee.

Content	A7: "All good, as expected"
Disappointed	A4: "It was so much work. I would have expected a little bonus"

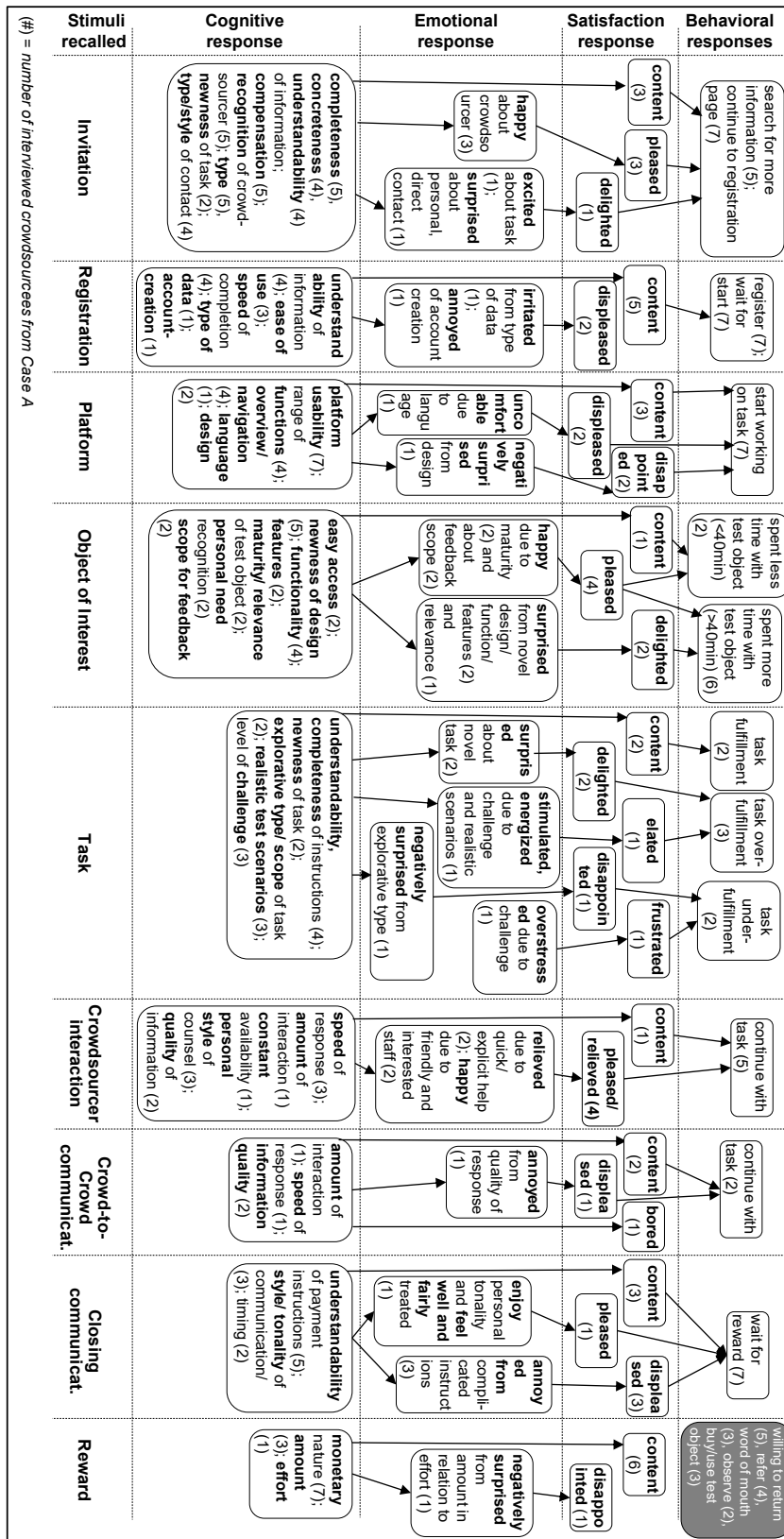


Figure 10. Experience-Analysis based on SILT-Approach for InsureCorp

Source: Own Illustration

Commitment

Collected data on ensuing commitment and behavior (*process step C and D*) towards InsureCorp demonstrates that four out of the seven interviewees described an attitude change and showed signs of calculative and affective commitment, while two showed no commitment at all and one showed signs of only calculative commitment.

- Crowdsourcers that described InsureCorp as “innovative”, “modern”, “open-minded”, “collaborative”, “customer-centric” or “supportive” after participation and who mentioned an improved brand image and a strengthened relationship to the crowdsourcer were identified as more *emotionally committed*. These crowdsourcers described diverse value contributions, like *return-intentions* for further projects, *referral and word of mouth* to colleagues regarding the participation, a *desire for additional contributions* without monetary reward, *willingness to use the test object* in future, *consumption-intentions* as well as an *interest in observing the further development* of the website.

Calculative & Affective Commitment	A2: “Now, [InsureCorp] feels more like a partner for me. [...] yes, I told colleagues about the project and also would recommend participation to everyone, generally interested in UX or in the product itself.” A4: “I feel, [InsureCorp] is very interested in its customers and wants to serve them best. That’s why they team up with us” A6: “I feel, I got to know them really well by that. Actually, next time I need to renew my insurance, I would have a look at their site. They seem very supportive. They responded within minutes to my questions. I bet they do the same for their clients.”
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- One interviewee described himself as only *calculatively committed* due to perceived utility concerning learning potentials in the area of website design, resulting only in a *willingness to return*, although other crowdsourcing projects were of interest too.

Calculative Commitment	A7: “I learned something about the newest feature and design trends. [...] I enjoy getting to know new things by participating in those initiatives. Most probably I will join another project, but it doesn’t have to be with [InsureCorp].”
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- Lastly, two interviewees stated to be *not committed* at all and perceived no change in attitude. They were not sure if they would participate in another project due to their negative experiences.

No Commitment	A1: “I found this whole project very stressful and unpleasant. I wouldn’t do it again.” A5: “I expected something way easier and faster to accomplish. I get the point of those platforms and I am sure there are people out there who enjoy it but it’s not for me”
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3.3.3 Case B: RetailCorp

RetailCorp (name changed) is with circa 100,000 employees and around 2 million customer one of Switzerland’s largest retail companies. In 2014, it developed its own crowdsourcing platform, where customers were invited to e.g., vote for new products that are introduced in the shops, provide ideas for new product names or subscribe to test products before they are available in the shops. In 2016, RetailCorp decided to use the platform to also improve the user interface of its online shop, as this channel increasingly grew in importance for them.

For the investigated crowdsourcing project (May, 2016), around 300 customers of the web-shop were invited per email to participate in a crowdsourcing initiative via a link to an improvised sub-site of the existing crowdsourcing platform, consisting of a registration and landing page with access to some files that needed to be evaluated (design suggestions), a discussion board for crowd-to-crowd interaction and a survey tool. As the original crowdsourcing platform was not created for testing online products and also had no functionality for the crowdsourcer to directly interact with crowdsourtees, other channels had to be used and connected to the platform (e.g., a professional survey-tool to collect feedback in structured way and an email and phone channel for communicating with the crowd during participation).

Crowdsourtees were asked to evaluate several design-suggestions for a new interface and to provide their feedback by answering a structured survey. The crowdsourcer was able to interact with participants via mail and phone. In return for their contribution, they received a gift-voucher to buy products from RetailCorp (online or offline).

3.3.3.1 Crowdsourcing Experience and Engagement State

Again, Figure 11 gives an overview of perceived stimuli (*process step A*) and presents vertically the cognitive, emotional, related satisfaction and behavioral responses (*process step B*) from the seven interviewed crowdsourtees of RetailCorp. Captured responses regarding the final commitment states are elaborated in detail in the upcoming sections.

Satisfaction Responses

All previously identified stimuli were perceived and mostly experienced by interviewees (with a few exceptions for the crowdsourcer-interaction), shaping their *crowdsourcing experience*.

Similar as InsureCorp, 81 percent of the stimuli-evaluations resulted in a neutral or positive intermediate state. Almost 33 percent even resulted in a low to medium (1-2) positive arousal state that can be described as pleasant, delighted or elated. Assessing self-reported commitment states and (intended) behavior, it can be assumed that again different engagement states among crowdsourcers developed and in this case more calculative commitment states developed (43 percent). A more in-depth analysis of the underlying processes was necessary to identify mechanisms that caused different engagement outcomes.

- The **invitation** (sent via email) led to mainly *pleasant states*, due to feelings of happiness regarding the crowdsourcing enterprise and a personal relevance of the test object (pleasant).

Content	B7: "I only remember the description of the task and thought it's doable"
Pleased	B1: "I like [RetailCorp] and I use the site a lot. When I received the mail I was happy to hear they want to improve it and I liked the idea of supporting this project with my feedback."

- The **registration and platform** interface also led to either only *neutral states* or *displeasure* and even *disappointment*, due to an annoying amount of requested data, limited and bad integrations of functions.

Content	B3: "Nothing special, same as always. Easy."
Displeased	B6: "I was surprised that you had to use and open so many different things, like a survey on a different website, the screenshots as well as the live website. I expected this to be all together on one site."
Disappointed	B4: "Very basic platform. Looked like improvised. I thought that [RetailCorp] is more professional."

- The **object of interest** (website) led mainly to positive states, due to its maturity (*pleasant*), surprisingly modern design and features (*delight*) and stimulation of personal need recognition (*elation*). Behavioral data showed that emotionally aroused crowdsourcers spent also more time with the test object (more than 10 minutes) in comparison to the less aroused ones (less than 10 minutes).

Content	B7: "I remember that you had to open the website in a different tab and two images. But not sure what it was about."
Pleased	B1: "New designs looked promising, so advanced already! It felt like a sneak preview."
Delight	B3: "Super modern and sleek, didn't know [RetailCorp] has such good designers."
Elated	B5: "I never used the online shop as I find it quite hard to find products, but this looks much better. I'm actually excited to see it launch and try it. I saw already (...) during the experiment that I am interested in"

- The **task** (i.e., comparing two designs and filling out structured UX-surveys) led to neutral (*bored*), positive (*pleased*) and negative (*disappointed*) states, due to either happiness about the type of task or negative surprise about the low level of challenge. All crowdsourcers filled out the questionnaires and evaluated the **test object** as requested by the task.

Bored	B1: "Was easy and quick but nothing special, a bit boring but well."
Pleased	B2: "Was nice to compare options and pick the one that I liked more. Hope it wins."
Disappointed	B4: "I don't understand why they waste my time for this. This was really boring and I feel almost bad for getting a gift card for this. I just ticked some boxes..."

- The **interaction with the crowdsourcer via email** aroused simple *contentment* or even *pleasure* when responses were perceived as detailed but also led to *displeasure* when the contact channel (mail instead of platform) was disliked.

Content	B7: "I got a quick response as expected"
Pleased	B3: "I couldn't download and open the images at first. So, I emailed them and they wrote me a long response with a screenshot to explain me a workaround. That was nice and was happy to start the evaluation." B5: "I reported a problem and they quickly called me for support. Such nice people."
Displeased	B4: "A bit unprofessional to offer support only via email and no chat function. I guess they also check it only once per day."

- In contrast, *the interaction with other crowdsourcees via the platform* mostly led to *neutral states*, while some emotions were aroused when the chat was perceived as vivid and responses as helpful (*pleased/relieved*).

Content	B1: “I checked the thread quickly if someone else run into my issue. There were some comments.”
Pleased	B3: “Glad, that I wasn’t the only one who had problems with the prototypes. Others gave me helpful tips.”

- The *closing communication* (email including information on reward, planned changes based on feedback, other crowdsourcing projects) resulted in a broad range of emotional states, depending on the perceived impact and valence of surprise about decisions made by RetailCorp. Some ended up being *pleased* and *delighted* due to the tonality and sender, while others were *disappointed* because of the result.

Pleased	B3: “Was a short, friendly and appreciative email that showed the final result. Made me happy to see that this project led to something.”
Delight	B2: “I didn’t expect to receive a mail from the UX team itself! It’s great to see how serious they take those projects. Not just a marketing campaign or so.”
Disappointed	B4: “I don’t understand why they decided for this option. I don’t think most people like it.”

- Lastly, the *reward* (shopping voucher send via mail) led to a *neutral state (content)* as expectations were clear and the effort perceived as reasonable.

Content	B3: “What they promised us, a gift card for the shop. Very common for tasks like this.”
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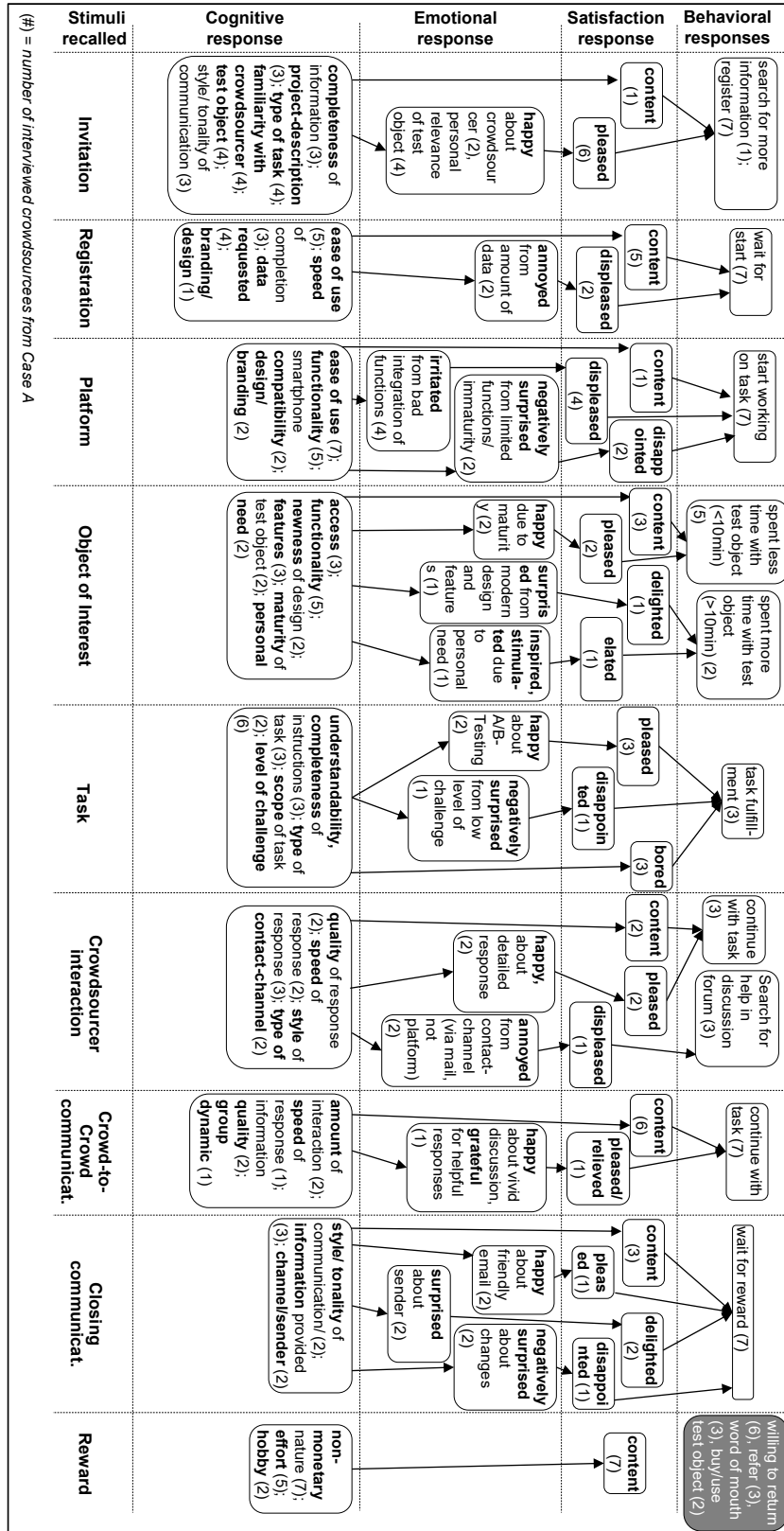


Figure 11. Experience-Analysis based on SILT-Approach for RetailCorp

Source: Own Illustration

Commitment

Data on the ensuing commitment and behavior shows that only three out of the seven interviewees described an attitude change and signs of at least some calculative and affective commitment towards RetailCorp. Three showed signs of only calculative commitment and one seemed to not have developed any commitment.

- Some of the crowdsourcers described RetailCorp as a “lovable” and “caring” company that has become a part of their life. Some even felt like a “member of the company”, much closer than before participation. Those crowdsourcers also mentioned *return intentions and referrals* related to the project and the company itself, as well as the *use of the test object*.

Calculative & Affective Commitment	B2: “I feel much closer to them, after this. I’m also seeing them around now way more often! I told my friends about it and also that I help improving the online shop.” B5: “[RetailCorp] is such a nice and carrying company and they really try to catch up with the online world although they have such a traditional business. I will definitely try the online shop.”
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- Two interviewees described themselves as at least *calculatively committed*, due to their interest in the reward and perceived utility through support of a product that is of use to them. They mentioned its *future use* and a general *willingness to return* for other crowdsourcing projects but would also join projects of other companies.

Calculative Commitment	B6: “I would do it again to get the voucher and support a shop that I visit from time to time. Sounds like win-win.”
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- Only one interviewee perceived no change in attitude and felt *not committed* to the crowdsourcer at all, unwilling to participate again as he missed the sense and incentive of this activity.

No Commitment	B4: “No, I wouldn’t participate again! I found this whole process way to unprofessional for such a big company that earns so much money.”
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3.3.4 Case C: MobilityCorp

MobilityCorp (name changed) is one of Switzerland's public railway companies, responsible for passenger traffic, cargo, infrastructure service and real estate. The corporation with circa 30,000 employees and 1.25 million passengers, says it is led in an entrepreneurial manner.

In 2016, MobilityCorp initiated a public crowdsourcing project, in which customers were asked to contribute to the development of a new mobile application for information on transportation, schedules and ticketing, replacing one of the company's digital core products. The project goal was to replace the legacy system that led to low satisfaction scores among users and instead to co-create a new application with an improved value proposition that would lead to a higher value in daily use. As around 70,000 transportation tickets are sold via the app on a daily basis, the redevelopment was urgently necessary.

Therefore, MobilityCorp launched a self-developed and fully branded crowdsourcing platform with access to the beta version of the new application. The platform could be accessed via phone and desktop. In order to participate, consumers had to simply register and download the beta version of the current development state of the app. Crowdsourcers were able to provide ideas for new features and major improvements, file bugs for functional issues of the current version of the app, and vote for ideas. For about nine months, 11,408 crowdsourcers registered on the platform.

Contributions were publicly visible and could be commented, tagged and voted by other registered crowdsourcers as well as the crowdsourcer. Hence, a more collaborative approach with a broad test-scope (whole application) was chosen. The crowdsourcer had the role of a moderator to guide discussions and clarify tasks and questions. Moderators were easily recognizable due to their firm logo that was used as profile picture and a special "moderator" tag next to their names. Their role was to guide discussions, appreciate contributions, tag the status of consumers' posts (e.g., "implemented" or "in progress"), and to clarify any questions and provide support. Private messages, exchanged with other members or the moderators via the messenger function on the platform, were not publicly visible.

Participation was voluntary and no monetary reward was offered during the project phase. To incentivize participation, a gamification approach was chosen by which crowdsourcers could receive badges related to the amount of contributions provided.

3.3.4.1 Crowdsourcing Experience and Engagement State

Again, Figure 12 gives an overview of perceived stimuli (process step A) and presents vertically the cognitive, emotional, related satisfaction and behavioral responses (process step B) from the eight interviewed crowdsourcers of MobilityCorp. Captured responses regarding the final commitment states are elaborated in detail in the upcoming sections.

Satisfaction Responses

All previously identified stimuli were perceived and mostly experienced by interviewees (with one exception for crowdsourcer-interaction and crowd-interaction), shaping their *crowdsourcing experience*. In the case of MobilityCorp, the stimuli “reward” represents the experience with the gamification feature on the platform.

Similarly to the prior two cases, 82 percent of the stimuli-evaluations resulted in a neutral or positive intermediate state. 31 percent resulted in a low to medium (1-2) positive arousal state that can be described as pleasant or delighted. Assessing self-reported commitment states and (intended) behavior, it is observed that again different engagement states among crowdsourcees developed, with 50 percent identified as affective commitment. A more in-depth analysis of the underlying processes was necessary to identify mechanisms that caused different engagement outcomes.

- More specifically, the **invitation** (email, newspaper article, in-app advertisement) led only to positive arousal states. *Pleasant states* were aroused due to positive feelings towards the crowdsourcer, who was the direct sender of the email and a perceived personal relevance of the test object. *Delight states* were aroused due to *excitement* and surprise about the project and task.

Pleasant	C1: “the article made me curious, the app is quite important for me. I’m a commuter.”
Delight	C5: “I didn’t expect [MobilityCorp] to be so modern and open-minded. I was excited to find out more”

- The **registration and platform interface** mostly led to *neutral* and a few *frustrated* states. *Neutral* crowdsourcees felt confident to provide their data when creating a profile due to the crowdsourcer’s big and known brand as a state-owned company. *Frustrated* participants felt confused and annoyed from the platform’s navigation and structure, the search function and simple user interface (UI).

Content	C2: “The page looked professional at first, like something official. I felt confident when registering for it.” C3: “I remember, I needed to fill out a form but nothing specifically good or bad.”
Frustration	C6: “Well, what shall I say? This page is a total mess! No wonder that there are tons of similar threads and contributions. Too much effort to go through all of them and search for the right one. Instead people just open a new one each time – like me.”

- The ***object of interest*** (i.e., the app) led to *neutral* and positive states due to relevant new features that were suggested and personalization options (*pleasant*) as well as its modern and surprisingly novel design (*delight*). The behavioral data collected from the platform showed that emotionally aroused crowdsourcees visited the app more often (more than four visits) less aroused ones (less than four visits).

Content	C7: “It seemed to me that they were already quite far with this project.”
Pleasant	C8: “I feel good about it. Great that you can create your own site with all important places.”
Delight	C4: “Great design. Glad to see such a positive development compared to what we have now. (...) No, I didn’t expect that. I feel in Switzerland we are always a bit behind, technology-wise but this is state of the art!”

- ***The task*** (i.e., app exploration with own, actual use case, beta-testing) covered the whole range of emotions from *pleased* to *disappointed*. Feelings of stimulation and pride were aroused due to the broad scope of task and option to contribute in different ways (e.g., reporting bugs, suggesting ideas, voting). One crowdsourcee reported that he felt *disappointed* by the way MobilityCorp structured the tasks and described it as “meaningless”. Contribution analysis revealed that more pleased crowdsourcees did more than was expected in the task (over-fulfillment), while disappointed ones contributed much less (task under-fulfillment).

Content	C1: “They structured the whole project very openly. Everyone could provide what they want or felt like.”
Pleased	C3: “Good to have a choice. The design guy can provide design-ideas and I can take care of the bugs.”
Disappointed	C6: “the tasks were a bit meaningless (...). I prefer, when they are more clear and structured. It looked to me as if the company just wanted to get some consumer attention.”

- Similarly, ***interaction with the crowdsourceer*** via the platform or private chat aroused positive as well as negative intermediate states. *Pleased* crowdsourcees liked the direct and publicly visibly response from the moderators and enjoyed the attention, while *unhappy* participants felt they got too less or no attention or support at all, after contributing to one of the tasks.

Content	C3: “I saw that sometimes those moderators’ fueled discussions. I guess it helps to keep the crowd going.”
Pleased	C5: “I liked, when they reacted to my ideas and especially when they add the tag ‘completed’ or something. You know they are actually doing something with it.”
Displeased	C6: “When I voluntarily work for Swiss-Mobility, I would expect some response. (...) Yes, I felt disappointed.”

- The ***interaction with other crowdsourcees*** via the platform or private chat led mostly to a *neutral* or rather cognitive state and participants described it as a “means to an end”, for solving problems collaboratively or developing ideas further. Only one interviewee felt stimulated and inspired by a comment from another crowdsourcee and could be identified as *delighted*.

Content	C3: “For me this is simply part of the experience. If I cannot see comments from others, what’s the point of it? But it doesn’t make me excited or overly happy.”
Delight	C2: “Thanks to that comment, I had something like a Eureka moment! I posted my new idea right away.”

- The ***closing communication*** (received at the end of the project, after 9month) also resulted in negative (*disappointment*), positive (*pleased*) or *neutral (contentment)* states. Disappointed crowdsourcees complained about the late communication and they wished they would have heard from the crowdsourcer earlier.

Content	C4: “It was just a mail with some background information on the project and saying that it ends now.”
Pleased	C5: “I liked that they got back to me at the end. I felt, I did something valuable for them.”
Disappointed	C7: “I posted two bugs, few ideas and supported other contributions on the platform. I would have expected a little thank you mail or something earlier.”

- Lastly, ***the reward*** (gamification elements that could have been perceived during the participation phase) led mostly to a *neutral states (content)* and few did not even remember the badges or status names as they did not mean anything to them. One person got a special award and felt *delighted* and one felt *displeased* as she wished to get some form of monetary compensation, but that was an exception.

Content	C8: “I guess the idea is to motivated people to participate. But I contributed to improve this silly app and not to earn a star or points or anything like that. I don’t really care about it”
Delight	C3: “I actually got awarded as top contributor and I was on a list that popped up on the landing page. I didn’t expect that and felt quite honored. I then took on a role as a special moderator to support discussions.”
Displeased	C6: “It would have been right to get some form of proper reward like a voucher for train tickets or so. For all the free ideas they get from us.”

Commitment

Data on ensuing commitment and behavior shows that half of the interviewees (four) described an attitude change and signs of calculative and affective commitment. Three showed signs of only calculative commitment and one seemed to not have developed any commitment.

- Some of the crowdsourcees felt a need to further support MobilityCorp and described them as a “modern”, “reliable” and “trustful” company that works hard on improving the customer experience. When asked about future behaviors, most interviewees who mentioned one of the named benefits also indicated *intentions to return*, *positively talk* about the project and *refer participation* to friends and family due to their overall positive participation experience and relationship towards the initiators. Some mentioned that they provided *good ratings* in the app store after participation.

Calculative & Affective Commitment	C2: “We are here to help [MobilityCorp] and the result looks great. I hope they launch more projects like this.” C3: “I definitely would join another time. It’s a great initiative. I also convinced my partner to join.”
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- Three interviewees described themselves as at least *calculatively committed*, due to the perceived utility of the test object and mentioned its *future use*. They would also join projects of other crowdsourcees, if the test object is of interest to him.

Calculative Commitment	C7: “This project was necessary and every time I open the app I’m happy to see new features coming out of the community. I stopped contributing at some point. I don’t know why. Sometimes I have ideas but then I am too lazy to put them in. You cannot be sure if someone cares about your post.”
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- Only one interviewee perceived no change in attitude and felt *not committed* to the crowdsourcer at all, unwilling to participate again as he missed the appreciation and interaction with the crowdsourcer during the project and a proper incentive afterwards.

No Commitment	C6: “I feel I did way too much for what I got out of it. I wouldn’t join again.”
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3.3.5 Case D: TelcoCorp

TelcoCorp is one of Switzerland largest cable operators with circa 1500 employees, providing telecommunication, internet, TV, and radio services for circa 1.1 million customers. In 2016, TelcoCorp launched its crowdsourcing initiative to actively involve customers in product development and testing before launch. For this project, they closely collaborated with an intermediary that provided a professional crowdsourcing platform for launching projects and managing crowdsourcees' registration and compensation processes. While the entry point for the platform was via the crowdsourcer's homepage, every other activity took place on the intermediary's platform. The crowdsourcing initiative under assessment took place in 2017 and lasted for 6 weeks. Circa 300 TelcoCorp customers with a TV product were invited via email to test and explore a new app to watch TV from all devices (smartphone, tablets and PC).

While the task was very broad and more of an explorative nature, structured threads for bug contributions, feature requests and performance issues were provided on the crowdsourcing platform for categorizing contributions. Crowdsourcees were able to talk to other crowdsourcees via a discussion board and to the crowdsourcer via a chat function, both provided on the crowdsourcing platform. At the end of project (after 6 weeks), crowdsourcees received a survey about their general satisfaction and some questions about the usability of the product. After submission, crowdsourcees received a closing mail and a monetary reward (as communicated in the invite) via PayPal.

3.3.5.1 Crowdsourcing Experience and Engagement State

Again, Figure 13 gives an overview of perceived stimuli (process step A) and presents vertically the cognitive, emotional, related satisfaction and behavioral responses (process step B) from the eight interviewed crowdsourcees of TelcoCorp. Captured responses regarding the final commitment states are elaborated in detail in the upcoming sections.

Satisfaction Responses

All previously identified stimuli were perceived and mostly experienced by interviewees (with one exception for crowd-to-crowd interaction), shaping their *crowdsourcing experience*.

Slightly lower than the prior three cases, 79 percent of the stimuli-evaluations resulted in a neutral or positive intermediate state. 31 percent resulted in a low to high (1-3) positive arousal state that can be described as pleasant, delighted or elated. Looking at the self-reported commitment states and (intended) behavior, it can be assumed that different engagement states among crowdsourcees developed and compared to the prior cases a larger amount of desired affective commitment state (63 percent) were identified, despite the comparable distribution of intermediate arousal states. A more in-depth analysis of the underlying processes was necessary to identify mechanisms that caused different psychological and behavioral engagement outcomes.

- The **invitation** (email) led to a mix of *neutral* and *pleasant states*. Similar as in prior cases, *happiness* was aroused due to the crowdsourcer's name or brand itself and especially a personal relevance of the test object for some crowdsourcers. Neutrally stated crowdsourcers reflected on things like project description and type of task, completeness of information or talked about the tonality and style of the invite.

Content	D1: "The app didn't say a lot to me at that point although I'm a [TelcoCorp] customer. It just sounded like a good opportunity to get some money, to be honest. So I thought, why not."
Pleasant	D2: "I liked the idea of contributing to this project. I spend one hour each day in the train and I like watching TV or Netflix on my tablet."

- Similar as in prior cases, the **registration and platform interface** only led to *neutral* or negative statements, resulting in *displeased* states due to registration-, usability-, language- or performance issues.

Content	D5: "As expected, just a platform with some tabs to submit issues and to get in contact with [TelcoCorp] and other customer."
Displeasure	D3: "For me it was difficult. I'm not used to all those terms and words. I wasn't sure what the difference between a bug or a feature request is. Also I felt it was all a bit unstructured."

- The **object of interest** (i.e., the TV app) led only to neutral or positive states due to personal relevance, ease of use and the functionalities. For some crowdsourcers the personal relevance led even to a state of *delight* or *elation*, which happened when they have not expected it in advance and felt overly stimulated and inspired by the product. Emotionally aroused crowdsourcers also mentioned that they want to use the app in future and some even gave a positive rating in the app store, to show their excitement about it.

Content	D5: "I knew it before, not sure what has changed. It looked the same to me."
Pleased	D2: "I looks nice. Feels good to me."
Delighted	D8: "It's very simple and has just what is needed. I love it!"
Elated	D3: "I never thought I would watch TV on my phone. This is so nice and easy! I spent way too much time with exploring the app and testing my phones connectivity while using it."

- As in prior cases, **the task** (i.e., app exploration, beta-testing) covered the whole range of emotions. Feelings of happiness and surprise regarding the flexibility, broad scope, fun and impact led to *pleasant* and *delight* states. Only one crowdsourcer was overwhelmed with the task and did not know what to do, which turned into a state

of *displeasure*. Contribution analysis revealed that more emotionally aroused crowdsourcers contributed also more (5-7 submissions) than not aroused ones (1-4 submissions).

Content	D1: “Well, as far as I remember it was just about using it. Nothing special to me.”
Pleasant	D6: “I liked that we were free to do what we wanted. Was nice exploring it.”
Delight	D4: “I didn’t expect to test the whole app! I thought we get to see some early-stage mocks or so. But this was actually quite fun to test!”
Displeasure	D5: “I had no clue what to do. I waited for some time. I thought we get instructions, but nothing happened.”

- Similarly as task, ***crowdsourcer-interaction*** via the support chat covered a broad range of emotions. *Pleased* crowdsourcers were happy about the friendly response from the crowdsourcer, when asking for support, e.g., due to ID verification issues. Others felt *delighted* or even *elated* from being proactively contacted by the crowdsourcer, who showed interest in their feedback and wanted to find out more. One *displeased* participant was unhappy from missing interaction and support, after getting in touch with the crowdsourcer.

Pleasant	D3: “They send me a very nice response and excused for all the issues.”
Delight	D7: “I wasn’t even sure if anyone reads my comments, but then they texted me all of a sudden and wanted to know more about my problem and my idea to solve it. Was surprising!”
Elated	D1: “I had some issues with installing and registering the app due to my two different customer IDs but [TelcoCorp] went above and beyond to get me on board! We had so many conversations via the messenger and in the end they basically created a new account for me which even solved some payment issues, which I had. I always got two bills. Now I get one. This was service at its best!”
Displeasure	D5: “I texted [TelcoCorp] or whoever receives those messages but never got a response. I felt helpless and I would have wished to hear back from them. It was my first and most probably last time, I tried this.”

- Similarly as in other cases, the ***interaction with other crowdsourcers*** via the discussion board was more cognitively evaluated, leading to a neutral (*content*) state for most expect for one slightly negatively and one slightly positively aroused crowdsourcer, due to vivid discussions on the one side or missing responses on the other.

Content	D2: “I suggested an idea and wanted to get a second opinion on it but no one reacted to it.”
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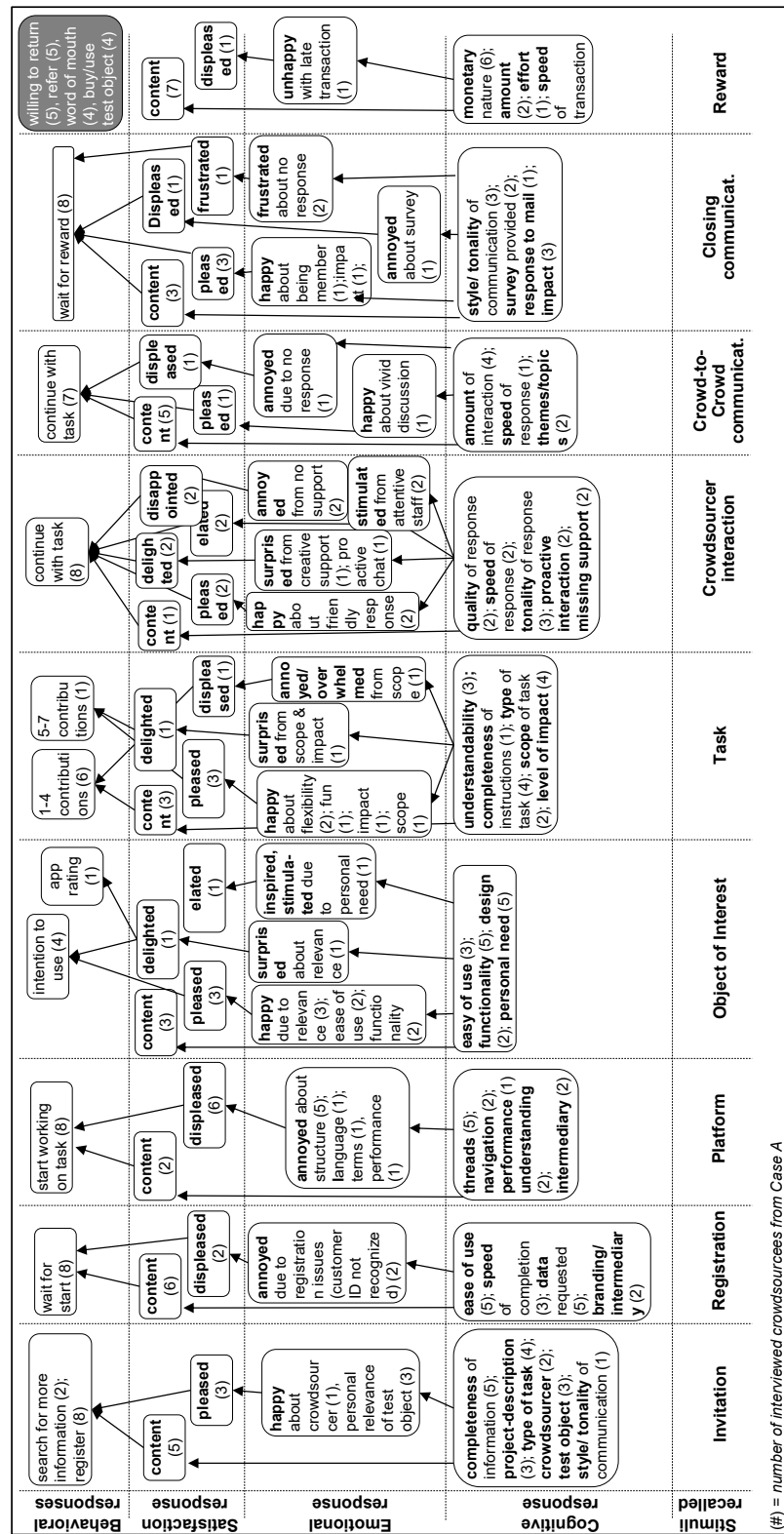
Pleasant	D7: “There was an interesting thread on device policies going on. I learned something new from that although it was unrelated to the app.”
Displeasure	D5: “After contacting the crowdsourcer, I also check the forum but no one talked or specified the task there. It was all about registration issues and some more general discussions on [TelcoCorp] product portfolio.”

- The ***closing email, including a last survey*** for testing overall satisfaction and usability perceptions resulted in neutral (*contentment*), positive (*pleased*) or negative (*displeased*) states, depending on the perceived tonality, level of perceived effort and impact and response experience.

Content	D8: “I assume some people didn’t post anything until that point. So the survey helps to collect more feedback. Makes sense to me.”
Pleasant	D4: “I felt good about being a participant. They wrote that the feedback is considered in the final product.”
Displeasure	D5: “Finally a concrete task! I don’t understand why they haven’t sent this earlier. Would have helped me a lot.”
Frustration	D2: “I feel, nobody really cared about my suggestions during this project – neither [TelcoCorp] nor other contributors got into discussion with me. Not sure if this survey is read by anyone. I didn’t put a lot of effort into it.”

- Lastly, ***the reward*** (fixed monetary amount) led mostly to a neutral state (*content*) as expectations were clear (amount was known before participation) and effort perceived as reasonable for all, apart from one *displeased* interviewee, who had a delayed transaction.

Content	D7: “I received a notification a few days after the submission of the survey. I almost forgot about it”
Displeasure	D6: “I haven’t received it until I texted the platform provider. I felt a bit bad to kind of beg for my money.”



(#) = number of interviewed crowdsources from Case A

Figure 13. Experience-Analysis based on SILT-Approach for TelcoCorp

Source: Own Illustration

Commitment

Data on ensuing commitment and behavior shows that five out of eight interviewees described an attitude change and signs of calculative and affective commitment. Only one showed signs of calculative commitment and two seemed to not have developed any commitment.

- Some of the crowdsourcees mentioned that they would participate again, although they were originally not interested in the test object, nor did they describe the whole crowdsourcing process as satisfying. Instead, it seems they build a connection to the crowdsourcer, found the task to be joyful or the test object surprisingly relevant. Those crowdsourcees also mentioned *return intentions*, independent of the test object and that they would *recommend* others to do it and *talk about the project* and the crowdsourcer.

Calculative & Affective Commitment	D1: "I would say the whole experience was so lala and I initially participated because it was easy money. But I liked how [TelcoCorp] did everything to support me and even solved my account issue thing. Their customer orientation is unusual! I would do it again for sure, although I still don't care about the TV app." D4: "It was fun. I liked exploring the app and all that. The submission system was not ideal, but it's not [TelcoCorp's] fault. I sent feedback to the platform provider and suggested to do a test-project for their own product (laughs)."
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- One interviewee was identified to be *calculatively committed*, due to the perceived utility of the test object. He mentioned his intention to *use it in future*. He also joins projects of other crowdsourcees, when the test object is of interest to him.

Calculative Commitment	D8: "I like the app but I knew it before. Not sure if anything changes now. I think it depends on the product and initiator. I would only do it again if it's relevant for me."
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- Two interviewees perceived no change in attitude and felt *not committed* to the crowdsourcer at all, nor to the product or other crowdsourcees. They said they are not willing to participate again due to missing interaction or unclear tasks.

No Commitment	D5: "I didn't feel the project gave me anything. It was effort to set everything up and then no one talked to me or said me what to do. I got money for nothing."
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3.4 Synthesis: The Engagement Formation Process across Cases

In a next step, identified satisfaction responses of all four cases were recoded into numerical categories according to the suggestion presented in Chapter 2 (Figure 6) and presented together with assumed commitment states here in Figure 14. This allows a direct comparison of the *Crowdsourcing Experience* and related end states to identify patterns across the 30 end-to-end journeys and to come up with initial assumptions on dominant engagement drivers. By looking at the table, the following observations can be made:

First, it can be observed that crowdsourcees from all cases, who felt displeased, disappointed or even frustrated about *the task* or with the *crowdsourcer-interaction* (e.g., A1, A5, B4, C4, D2, D5), did not develop any form of commitment (NC), independent of how they evaluated their experiences with other perceived stimuli throughout their journeys. The same outcome is observed when any form of dissatisfaction with *the task* and *crowdsourcer-interaction* occurred individually (e.g., A1, A5, D2) or both together within one journey (e.g., B4, C6, D5). Therefore, it is assumed that each of those experience evaluations play an important role in the formation of disengagement and can be called dominant negative engagement drivers for those four case studies. In contrast, negative emotional arousal from experiences with the *registration interface*, *the platform interface*, *the closing mail* and/or *the reward* are not always related to *no commitment states* (e.g., A2, A3, A6, A7, B1, B3, B6, B7, C1, C2, C7, C8, D1, D3, D4, D6, D7, D8). Hence, based on data from those four crowdsourcing projects, those stimuli are not identified as dominant drivers.

Second, it can be observed that crowdsourcees from all four cases, who felt pleased, delighted or even elated *from the task* or *from crowdsourcer-interaction* (excluding *dissatisfaction* with one of those two stimuli) (e.g., A2, A3, A4, A6, B2, B3, B5, C2, C3, C4, C5, D1, D3, D4, D6, D7), were also identified to be somewhat affectively and calculatively committed (ACC). The same outcome is observed when some form of positive arousal *from task* and *crowdsourcer-interaction* occurred, individually (e.g., B2, C2, C3, C4, D1, D7) or both together within one journey (e.g., A2, A3, A4, B3, B5, D3, D4, D6). Thus, it is assumed that those experience outcomes play a dominant role in the formation of engagement. They are from now on referred to as dominant positive engagement drivers. Nevertheless, looking at the rest of the journeys of those committed crowdsourcees, it can be observed that negative experiences with *the registration interface*, *the platform interface*, *the closing mail* and/or *the reward* seemed to have no dominant effect on the end state (e.g., A2, A3, A4, A6, B3, C2, D1, D3, D4, D6). In contrast, positive emotional arousal from experiences with the *registration interface*, *the platform interface*, *the closing mail* and/or *the reward* are also not always related to *commitment states* (e.g., A1, B4, C4, D2, D5).

This confirms once more that, based on data from those four crowdsourcing projects, those stimuli cannot be identified as dominant drivers.

Third, it is observed across all four cases that those crowdsourcees, who developed a solely neutral intermediate state from *the task and/or crowdsourcer-interaction* (excluding *dissatisfaction* with one of those two stimuli) (e.g., A7, B1, B6, B7, C1, C7, C8, D8), described themselves as only calculatively committed (CC).

Lastly, a few observations can be made related to those non-dominant experience evaluations. Although, they seem to have no dominant effect on final engagement states, there are still patterns across the four cases recognizable. It is observable that the *invitation mail* led to only neutral or low to medium high levels of emotional arousal (i.e., pleased, delighted). Similarly, the *object of interest* did not arouse any negative feelings. In contrast, the *registration* and *platform interface* as well as the *reward-receipt* mainly led to only neutral states or negative arousal (i.e., displeased, disappointed, frustrated). Furthermore, similarly to *the task* and *crowdsourcer-interaction*, *crowd-to-crowd interaction* and *closing mail* covered the whole range of intermediate states, including positive, negative and neutral evaluations.

Case-Specific Patterns and Assumptions:

- *The task* and *crowdsourcer-interaction* play a dominant role in the engagement process, while negative experiences foster disengagement and positive experiences engagement formation.
- The *registration interface*, *the platform interface*, *the closing mail* and/or *the reward* play no dominant role in the engagement process and alone cannot lead to a desired engagement state.

Stimuli	Pre-Participation Phase			Participation Phase				Post-Participation Phase		End State
	Invitation	Registration	Crowdsourcing Platform	Object of interest	Task	Crowdsourcer interaction	Crowd-to-Crowd communicat.	Closing communicat.	Reward	
InsureCorp (A)	A1	0	0	1	-3	-	-	-1	0	NC
	A2	2	-1	0	3	1	-	1	0	ACC
	A3	1	0	-2	1	2	-	-1	0	ACC
	A4	1	0	-2	2	0	1	0	-2	ACC
	A5	0	0	-1	0	-2	-	-1	0	NC
	A6	1	-1	-1	1	2	1	0	0	ACC
	A7	0	0	0	1	0	0	-0	-1	CC
RetailCorp (B)	B1	1	0	-1	0	-0	-	0	0	CC
	B2	1	0	0	1	1	-	0	2	ACC
	B3	1	0	-1	2	1	1	1	0	ACC
	B4	1	0	-2	1	-2	-1	0	-2	NC
	B5	1	0	0	3	1	1	0	1	ACC
	B6	1	-1	-1	0	-0	0	0	1	CC
	B7	0	-1	-1	0	-0	0	0	0	CC
MobilityCorp (C)	C1	2	0	-3	0	0	-	0	0	CC
	C2	2	0	-3	0	0	1	2	-2	ACC
	C3	2	0	0	1	1	0	-	0	ACC
	C4	2	0	0	2	1	0	0	0	ACC
	C5	1	0	0	1	0	1	0	1	ACC
	C6	2	0	-3	0	-2	-1	0	0	NC
	C7	2	0	0	0	0	-1	0	-2	CC
	C8	1	0	0	1	0	0	-0	0	CC
TelcoCorp (D)	D1	0	-1	-1	0	0	3	0	1	ACC
	D2	1	0	-1	1	1	-2	0	-3	NC
	D3	1	0	-1	3	1	1	-	1	ACC
	D4	0	0	-1	1	2	1	0	2	ACC
	D5	0	0	0	0	-1	-1	-2	-1	NC
	D6	1	-1	-1	1	1	2	0	0	ACC
	D7	0	0	0	2	0	2	1	0	ACC
	D8	0	0	-1	2	0	0	0	0	CC

A/B/C/D/# = Interviewee ID of each Case

0 = Contentment / Calmness
1 = Pleasant / Relief
2 = Delight
3 = Elation

-0 = Boredom
-1 = Displeased
-2 = Disappointment
-3 = Frustration

-X = Dominant Negative Driver
X = Dominant Positive Driver
-X = Offset Negative Experience
0 = Dominant Neutral Experience

NC = No Commitment
CC = Calculative Commitment
ACC = Affective & Calculative Commitment

Figure 14. Overview of Satisfaction Responses and End-States across Cases

Source: Own Illustration

3.5 Discussion

Based on the observations across the four case studies, identified stimuli along the crowdsourcing journey can be clustered into four groups, inspired by the attribute-based perspective proposed by Kano et al. (1984). Clustering is dependent on the level of arousal as well as the valence of arousal. Those stimuli groups are further called: 1) *Door Openers*, 2) *Risk Factors*, 3) *Game Changers*, and 4) *Value Adders*. The concept of those four groups was first introduced and illustrated with two crowdsourcing cases in an article, published in the BISE Journal (Troll et al., 2018). This chapter offers a significantly further developed, in-depth presentation of the four stimuli groups:

Door Openers

Door Openers refer to stimuli that must arouse positive emotions or at least neutral states at the very beginning of an interaction process to motivate a crowdsourcee to actually take part in the initiative.

In the observed cases, this was enabled by the initial *invitation communication* that was sent to the crowd in the beginning of the process. From motivation literature, we know that at least two types of crowdsourcees exist that need to be stimulated differently (Brabham, 2010). Intrinsically motivated crowdsourcees are interested in self-fulfillment through the perceived content and the experience itself, while extrinsically motivated crowdsourcees are interested in the reward or external recognition (Zheng, Li, & Hou, 2011). On the one hand, to stimulate intrinsically motivated crowdsourcees, positive emotions need to be aroused through the information provided (e.g., on crowdsourcer, task, object of interest, etc.), style and tonality (e.g., personal, warm, innovative) as well as the type of contact channel (e.g., e-mail, social media, newspaper). A perceived importance and personal relevance needs to be sensed by those crowdsourcees, also referred to as involvement (Mittal & Lee, 1989). On the other hand, to stimulate extrinsically motivated crowdsourcees, expectations regarding the reward need to be at least met, resulting in a natural (cognitive) state of contentment.

Looking back at the expectations of the project owners and other consortium members, most agreed on the idea that the *invitation for participation* is an important interaction point to win the right crowd and build initial interest. Consequently, in line with original intuitions, this study suggest in order to ensure that both types of motivations are addressed, crowdsourcees' expectations on content and reward need to be known and the stimulus experience proactively designed accordingly. Nevertheless, while it seems intuitive that one of the two types of initial states need to be developed as otherwise no participation takes place due to the voluntary character of crowdsourcing, the question stays in how far the initial state impacts the rest of the journey. Past studies provide contradictory findings on the role of expectations and involvement for experience evaluations. However, to keep things simple for now, this topic is the focus of the next chapter.

Risk Factors

Risk Factors refer to stimuli that in the best case foster a neutral state, while bad experience perceptions lead to negative emotional arousal.

Here, the stimuli *registration*, *platform*, and *reward* were observed to be such *risk factors*. First, their performance are simply taken for granted as they are basic requirements that are needed for the whole process to function in its most rudimentary way (Kano et al., 1984). Without registration and the platform itself, no task and test object can be accessed and no feedback provided. Across the assessed cases, this may be further explained by the crowdsourcees' concrete expectations due to their prior familiarity with other crowdsourcing platforms and registration interfaces in general as well as the pre-defined

reward in the beginning of the process (Oliver & De Sarbo, 1989). Additionally, the character of those types of stimuli is mostly administrative as e.g., the platform's role is mainly that of coordinating communication between the crowdsourcer and the crowd (Peng, Babar, & Ebert, 2014).

Looking back at the expectations of the project owners and other consortium members, the *crowdsourcing platform* itself was seen as an important engagement driver due to its repeated use and high visibility throughout the crowdsourcing journey. Consortium members assumed that an exceptional design and platform usability makes a difference among crowdsourcers. Moreover, a fairly or even above average monetary *incentive* was suggested to be a driver of engagement, too. While this study clearly does not suggest that the platform and reward can be completely ignored when designing engaging *crowdsourcing experiences*, as it has the potential to create negative moments of interactions, it suggests to invest less in *risk factors* and emphasize other stimuli more. Consequently, in order to ensure contentment and avoid negative emotions, this study proposes that crowdsourcers' expectations in terms of reward type and amount, interface usability (ease of use), design, language and requested data for registration need to be well-understood and fulfilled. However, according to the findings here, no effort needs to be invested in trying to over-fulfill them as they are assumed to have no or limited effects on engagement.

Game Changers

Game Changers refer to stimuli that have the potential to arouse all types of satisfaction responses, even highly positive and negative emotions, depending on the experience perceptions. They are assumed to have substantial impact on the subsequent stimuli evaluations as well as the overall commitment state.

Here, *the task and crowdsourcer-interaction* were observed to be *game changers* throughout the interaction. Those stimuli play a key role as they are specifically demanded and also necessary for any social interaction. Yet, there is also potential for positive expectation disconfirmation and high arousal. One explanation may be that experiences with stimuli like *task* and *crowdsourcer communication* are rather variable for each crowdsourcing campaign (in comparison, e.g., to the *crowdsourcing platform* that stays the same) and expectations may be more loosely defined. In such a case, even for generally familiar crowdsourcers it can be seen as a novel experience and the crowdsourcer "expects the unexpectedness", which can be negatively and positively disconfirmed, accompanied by low to high emotions (Oliver & De Sarbo, 1989).

Due to their arousal potential, those stimuli may impact subsequent experience evaluations, especially if they have the opposite valence. As a switch of valence often occurs without passing the neutral state (Briggs et al., 2008), high positive arousal related to a *game changer* may influence subsequent negative arousal, e.g., for a risk factor, in a much more intense way, making it stronger than it would have been as a single (independent)

experience. This may also explain, why for example *crowd-interaction* aroused only in selected journeys some emotions (right after highly emotional experiences with the crowdsourcer). Yet, those experience evaluations showed no dominant effect on commitment and were not observed in any other journey across the four cases. Instead, crowd-interaction seemed to have had a rather neutral-cognitive effect on crowdsourcers.

Additionally, the *closing communication*, which is often related to crowdsourcer-interaction, may take a specific role as it is the last direct interaction with the crowdsourcer. Although, like crowd-interaction, it cannot be identified as a game changer due to missing dominant effects, it still arouses diverse emotions. Hence, when evaluating the overall experience, it may have a lasting effect as the most recent memory and support overall engagement formation.

Looking back at the expectations of the project owners and other consortium members, *interaction with the crowdsourcer* and the *platform intermediary* (depending on the set up) was expected to be of high relevance for engagement formation, as they were assumed to have the power to build a personal relationship with crowdsourcers and keep the participation going. While this seems to be true at least for interactions with the crowdsourcer, insights on the role of the intermediary within the engagement process were not the focus of this study. This will be assessed and discussed in chapter 7.

Consequently, this study proposes that when handling *game changers* it is not only important to manage novelty and expectation fulfillment, but also anticipate subsequent stimuli types and their arousal potential to avoid undesired high (negative) emotions.

Value Adders

Value Adders refer to stimuli that only foster positive emotional arousal due to surprise without causing any harm if their performance is bad due to their unexpectedness.

In our cases, mainly the *object of interest* was observed to fall into that category. It seems as if crowdsourcers cognitively develop expectations concerning the *task*, *reward*, *platform* and the *crowdsourcer* throughout the pre-participation phase, but spend no or less thoughts on anticipating the experience perception or relevance of the *object of interest* throughout the crowdsourcing activity. One explanation could be that due to the fact that the task is about giving feedback and further developing the test object, crowdsourcers expect low performance anyway

Nevertheless, as it is still unusual for firms to open up in their early development phases and involve consumers strategically before the product launch (Merlo, Eisingerich, & Auh, 2014), another explanation might be that there is a general expectation of low relevance of the test object (Kaganer, Carmel, Hirschheim, & Olsen, 2013). Hence, a feeling of positive surprise may occur if the test object has a substantial level of maturity, relevance (e.g., core offering of the firm), unexpected features, functions or design elements, or even triggers an unexpected personal need recognition. In comparison to emotional arousal due to novelty,

where the “unexpected is expected”, surprise may lead to even higher arousal (Oliver & De Sarbo, 1989). Other potential *value adders* in the crowdsourcing context could be, e.g., elements related to *gamification activities* or *crowd-interaction*, which could not be mapped to any group due to their mostly neutral evaluations.

Interestingly, when looking back at the expectations of the project owners and other consortium members, none of the here mentioned stimuli were expected to play any special role for engagement formation. While it seems true that those stimuli are not essential for engagement formation, this study showed that they can create additional value that creates not only lasting memories but also may come with positive side effects for the crowdsourcer, such as post-participation consumption, positive word of mouth and referral.

3.6 Proposition Development

Consequently, as the discussion of the four stimuli groups has shown, all types are supposed to take an important role throughout the interaction process and need to be managed strategically for the targeted engagement goal. Yet, *game changers* may take on a special role within the process of engagement, given that all other stimuli are perceived as at least neutral. It needs to be mentioned that stimuli and their specific roles may vary from case to case, depending on the specific project’s set-up and goal as well as the individual attributes. Based on these findings, three potential relationships between game changer arousal (e.g., task, crowdsourcer-interaction, and closing mail) and specific end-states regarding the crowdsourcer could be observed, independent of the experience evaluations with other stimuli. First, it is observable that positive emotional arousal by these stimuli seems to be related to affective and calculative commitment states (ACC), while the opposite can be observed (no commitment) when negative arousal appears. If no arousal at all is sensed, only calculative commitment states (CC) can be identified. Hence, based on these observations the following generalized propositions are made:

Generalized Propositions:

- (a) **the state of affective and calculative commitment (ACC)**, related to *diverse value contributions* (e.g., intentions to return, refer, observe, use/ consume) after participation, is proposed to interrelate with positive emotional arousal sensed with *game changers* during participation, independent of the experience evaluations with other stimuli.
- (b) **the state of no commitment (NC)**, related to *no return* intentions after participation, is proposed to interrelate with negative emotional arousal sensed with *game changers*, during participation, independent of the experience evaluations with other stimuli.
- (c) **the state of calculative commitment (CC)**, related to only *return* intentions after participation, is proposed to interrelate with no emotional arousal sensed with *game changers* and neutral experience evaluations with other stimuli, during participation.

3.7 Limitations

Here provided propositions were formulated in a way that they are also generalizable to other crowdsourcing contexts in order to explore and test them further with different types of projects and set-ups. Yet, insights need to be treated with care as empirical observations are based on four common crowdsourcing cases with a total of 30 interviews.

Although crowdsourcees were interviewed shortly after their last interaction with the crowdsourcer, the SILT-approach is a retrospective method, which may be flawed by a recall bias and memory lapses or ambiguity of the data interpretation (Jüttner et al., 2013). Besides, even though the sample size of 30 interviews complies with the recommendations for a SILT-based study (Reynolds & Gutman, 1988), it only slightly exceeds the lower limit of 20.

In addition, although we included only interviewees from the same cultural background and with similar familiarity, other crowdsourcee-related factors as e.g., personality, beliefs or social norms were not specifically considered in this study.

It also needs to be stated that in general, case study research is not sufficient to prove causal relationships (Yin, 2013). It served the purpose of exploring a new phenomenon and deriving initial postpositions for potential relationships between the *crowdsourcing experience* and engagement formation. However further studying and testing is needed to derive stronger arguments for the engagement process theory. For future research, it is recommended to verify proposed relationships with additional qualitative assessments and quantitative research. A survey approach may be applied, which tests satisfaction response levels related to specific stimuli and their impact on commitment and behavior. Also, experiments with manipulated stimuli may be used to explain effects in controlled settings. Ideally, log data analysis for studying actual behavioral engagement patterns on real crowdsourcing platforms can be assessed, in combination with interview data to measure psychological effects.

3.8 Conclusion

This multiple-case study is among the first that deals with the question of how the *crowdsourcing experience* impacts the engagement process throughout the crowdsourcing journey.

First research attempts offered valuable insights into the role of specific types of stimuli like the task (Sun et al., 2012) or platform design (Riedl et al., 2013), crowdsourcees' characteristics as interest and motivation (De Vreede et al., 2013) as well as behavioral measures for engagement (Nguyen et al., 2015). While those studies focused on the role of a single interaction point, this study looked at the whole crowdsourcing journey, considering all possible interaction points, individually and interrelated. Looking at the findings of this study, a key insight is that engagement depends on the interplay of specific

stimuli experiences, whereas some have a more dominant role and others a more passive role. According to this study, only if positive and emotionally arousing experiences are made with dominant drivers, so-called *game changers*, fully engaged crowdsourcers may be observed at the end of their journeys. On the flipside, if negative experiences are made with *game changers*, independent of the experiences with other stimuli, fully engaged crowdsourcers may not appear.

Thus, the engagement process model that was proposed in Chapter 2 (Figure 4), inspired by the model of Kano et al. (1984) and strongly shaped by the work of Oliver (e.g., 1989) and Briggs et al. (2008), can now be extended by the insights of this study. Figure 15 shows the proposed process input, process and process output factors that were identified across the four cases.

- First, *process input factors* relate to the stimuli that can be perceived throughout the crowdsourcing journey and that were shown to have a direct effect on engagement formation throughout the participation phase. In the context of this study, nine stimuli were identified and assessed. Hence, this model only makes assumptions based on those stimuli. In addition to that it was assumed that prior experiences create expectations that impact future experiences. Hence, for this model and all proposed relationships, it needs to be mentioned that crowdsourcers were consumers of the crowdsourcer and hence familiar to a specific degree, which may have affected the engagement process. Moreover, as findings were based on monetary and non-monetary rewarded projects, both, intrinsically and extrinsically motivated crowdsourcers participated in the four projects. More insights on potential differences will be presented in Chapter 5. All further model propositions need to be understood in the context of those process input factors.
- Second, the *actual engagement process* can only be initiated if the first stimulus, e.g. the invitation of potential crowdsourcers to the project, is either arousing any form of involvement or promises an incentive that is strong enough to attract attention. Only if this so-called door opener is effective, the engagement process can continue. Furthermore, the crowdsourcing journey is suggested to be dominantly affected by experiences with *game changers*, whereas three conditions apply: positive, negative and neutral experiences.
- Third, mostly depending on those experiences, the *engagement end-state* can be either described as affective, calculative or no commitment and *related behavioral intentions* as process outputs can be expected.

To conclude, stimuli should not be evaluated in isolation when assessing the potential factors of crowdsourcer's engagement state and *game changers* as well as door openers as a pre-requisite for any engagement formation need to be treated with extra care. Hence, as a more generalized conclusion it can be said that in order to holistically evaluate engagement, an integrated end-to-end process perspective combined with an experienced

view from the end-user perspective needs to be taken. An adapted form of SILT as a unique measuring technique was shown to be effective for making those assessments.

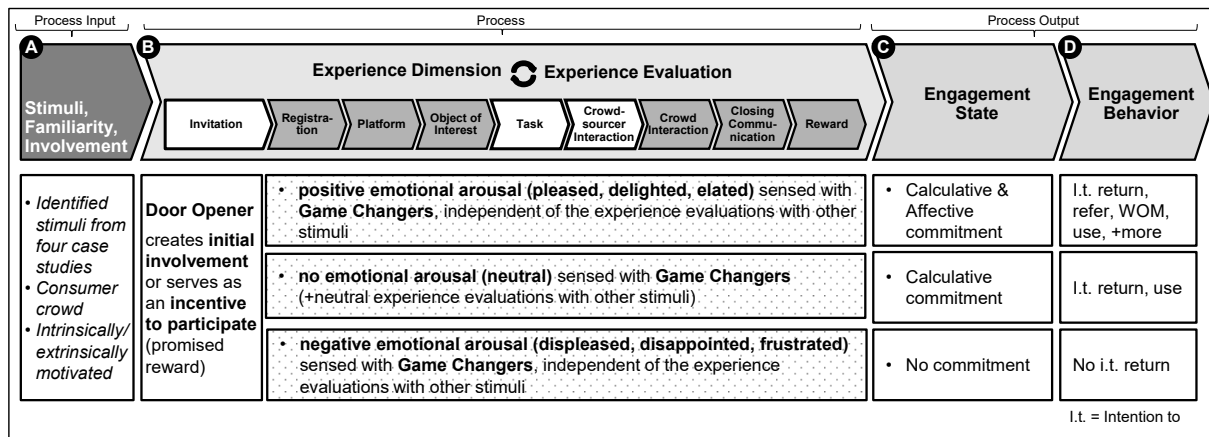


Figure 15. Extended Framework of the Crowdsourcing Engagement Process

Source: Own Illustration

Looking at the overall contributions of this study, it can be concluded that valuable knowledge for the field of crowdsourcing and engagement is derived. Generally, crowdsourcing facilitates the connectivity of people, organizations and societies via a technological platform. In the center of this research is the IT-mediated *crowdsourcing experience*, generated through diverse interaction points. Thus, it provides IS-researchers with a crowdsourcing-specific process model (i.e., the crowdsourcing journey blueprint), extended by the mechanisms driving engagement of crowdsorcees (i.e., the four types of stimuli groups and related satisfaction responses), and thus value for the crowdsourcer. Additionally, the concept of engagement is considered as a relatively young perspective in several research fields. By delivering first empirical insights on the engagement process, in the context of value co-creation, the aim is to support the progress of the concept from an emergent theme to a more mature construct. Furthermore, developing a better understanding of the currently realized *crowdsourcing experience* and the underlying drivers of engagement may help practitioners to improve the design and management of future *crowdsourcing journeys* and identify engagement opportunities.

Chapter IV

Deep Dive I: Role of a Platform Intermediary

*Why Incorporating a Platform-Intermediary Can
Increase Crowdsourceses' Engagement*

4 Why Incorporating a Platform-Intermediary Can Increase Crowdsources' Engagement

This Chapter reacts to the first part of research question three, by presenting the insights from the first deep dive study on the role of the intermediary for engagement formation. It provides a theoretical background about crowdsourcing intermediaries in general and comes up with some early assumptions on their impact on engagement formation. Contrasting cases are presented to reveal differences between engagement formation processes of crowdsources, who interacted with an intermediary and those who only interacted with a crowdsourcer as a single point of contact. The chapter concludes by providing an enriched process model that considers the existence of a crowdsourcing intermediary.

This Chapter builds on the following publication³:

Troll, J., Blohm, I., & Leimeister, J. M. (2018). Why Incorporating a Platform-Intermediary can Increase Crowdsources' Engagement. In: Business & Information Systems Engineering (BISE Journal), 1-18.

³ This chapter is a significantly modified and further developed version of the here mentioned publication for the purpose of this monograph. While the here mentioned publication was based on a two-case study, findings in this chapter are based on a multi-case study (four new cases).

4.1 Introduction

As many crowdsourcers still lack the competences, (technological) resources or crowd access to successfully execute crowdsourcing initiatives, crowdsourcing intermediaries (e.g., Testbirds or Amazon Mechanical Turk) play a key role in numerous projects (Zogaj et al., 2014). Depending on the service agreement, they can provide the platform as well as support the handling of the crowdsourcing process (Zogaj et al., 2014). This is also true for some of the consortium partners from the Competence Center Crowdsourcing, who incorporated intermediaries especially to get access to a professional and maintained crowdsourcing platform and outsource tasks that they were missing the skills and experiences for.

Yet, when looking at the crowd as a form of social capital for the crowdsourcer especially due to their multiple roles of being a platform-mediated worker, community member, consumer and influencer, handing over all or part of the power to an intermediary may mean that risks like decreased engagement, losing valuable contributors or in the worst case gaining even a reputation damage due to perceived negative experiences run out of their control. Additionally, crowdsourcers may miss a promising opportunity to directly interact and connect with the crowd and by that creating additional benefits in form of loyalty behaviors like word of mouth or cross-sale.

Therefore, based on the insights from the multiple case study on relevant engagement drivers along the crowdsourcing journey, among consortium partners the question arose in how far the incorporation of an intermediary benefits or hurts crowdsourcers' engagement, especially towards the crowdsourcer and the project. Consortium partners feared that intermediary's may absorb some of the positive attachment that crowdsourcers develop during the interaction process due to the prominence of the platform (most of the time intermediary-branded) throughout the participation phase. More specifically, they expected crowdsourcers to develop rather commitment towards the intermediary than the crowdsourcer or crowdsourcer's project itself.

While first studies dealt with management challenges from intermediaries' perspectives (Zogaj et al., 2014), their ability to solve problems (Terwiesch & Xu, 2008) or architectural structure (Colombo, Buganza, Klanner, & Roiser, 2013), the issue of how crowdsourcing intermediaries may influence crowdsourcers' psychological and behavioral responses, further referred to as engagement, within and after the interaction process has not been addressed by research yet. Apart from the theoretical relevance of studying mediated engagement processes in a socio-technical system, findings support management decisions on how to effectively incorporate platform-intermediaries, instead of investing in own systems and processes (Blohm et al., 2018). Hence, the following research question guides this chapter:

How and why do crowdsourcing intermediaries impact crowdsourcers' engagement formation towards the crowdsourcer?

To generate insights into this topic, this study builds on the data and analysis work from the multiple case study, presented in Chapter 3. Out of the four cases, two were mediated cases in which crowdsourcers (i.e., InsureCorp and TelcoCorp) incorporated a professional intermediary that provided a crowdsourcing platform and supported with crowd acquisition and management tasks. This study takes a closer look at the engagement journey and identifies potential differences that go beyond the categorization of generally favorable and less favorable stimuli experiences that was conducted in Chapter 3.

Against expectations and intuitions, observations illustrate that emotional and rational bonds developed towards the crowdsourcer even more strongly in mediated settings, most likely due to the crowdsourcer's sole control over engagement-driving stimuli and the absorption of negative experiences by the intermediary.

This study aims to:

- (1) Provide an overview of the *role of crowdsourcing intermediaries* from literature and illustrate its strategic placement in the engagement process model.
- (2) Compare findings from *four contrasting cases*, i.e. two with and two without the incorporation of a crowdsourcing intermediary, to identify potential differences in terms of crowdsourcees engagement formation.
- (3) *Derive propositions* on the impact of intermediaries on engagement formation and provide an *extended model of the engagement process* and recommendations for crowdsourcer on when and how to incorporate crowdsourcing intermediaries.

4.2 Crowdsourcing Intermediaries

As already mentioned, crowdsourcers can set up their own crowdsourcing platform and processes (e.g., My Starbucks Idea) or they can refer to intermediaries (e.g., Innocentive or Testbirds) that provide a technical infrastructure and access to a crowd. In this sense, they either serve as market places, offering a virtual platform where crowdsourcer and crowdsourcees simply interact for the purpose of value co-creation, or they act as mediators who offer additional services such as task specification, crowd acquisition, and evaluation of results to support the end-to-end crowdsourcing process (Zogaj et al., 2014).

On the one hand, these types of crowdsourcing intermediaries can be considered as brokers, ensuring that crowdsourcers do not only connect with a suitable crowd by providing the necessary skills and resources, but also to shift risks, efforts and overhead related to crowd and process management (Zogaj et al., 2014). On the other hand, if the crowd is considered as a form of valuable resource and social capital which often consists of actual and potential customers or end-users of the crowdsourcer, handing over full power to an intermediary may also bear some risks. As outlined by Zogaj et al. (2014), crowdsourcing intermediaries may face three main challenges, depending on their services: managing the process, the crowd, and the technology. In all three areas, mistakes can have major impact on the

crowdsourcing experience of participants and their engagement throughout the interaction process. Hence, the crowdsourcer may not only risk to lose valuable contributors during or after the interaction due to perceived negative experiences out of their control, but also their reputation, if undesired interactions are transferred to the brand's image (Gebauer, Füller, & Pezzei, 2013). Additionally, the crowdsourcing enterprise may miss a promising opportunity to directly interact and connect with the crowd, thereby stimulating overall engagement, which could create extra value, e.g., in form of positive word of mouth, further knowledge contributions, or repeated participation (Nambisan & Nambisan, 2008). By deploying a mediator, one may assume that he absorbs all the crowd's attention and commitment, comparable to the role of an employer, while the crowdsourcer is only perceived as an ordering party, defining the task and gathering the contributions. Positive impressions may be attributed to the intermediary, rather than to the crowdsourcer as the initiating party.

First studies dealt with the management challenges from an intermediary perspective (Zogaj et al., 2014), especially an intermediary's ability to solve problems (Terwiesch & Xu, 2008) and support the innovation process (Feller, Finnegan, Hayes, & O'Reilly, 2012) or the assessment of the architectural structure (Colombo et al., 2013) and platform-typification (Kaganer et al., 2013). However the issue of how and why crowdsourcing intermediaries influence crowdsourcees' experiences and associated psychological and behavioral responses to the crowdsourcer within and after the interaction process has not been addressed by research yet. Looking at the initial model of the engagement process, proposed in Chapter 2 and enriched with insights from a study presented in Chapter 3, an intermediary can be understood as a process input factor that is assumed to affect at least the experience evaluations with intermediary-owned stimuli. Figure 16 illustrates the incorporation of an intermediary as a potential process input factor and shows potentially affected stimuli throughout the journey.

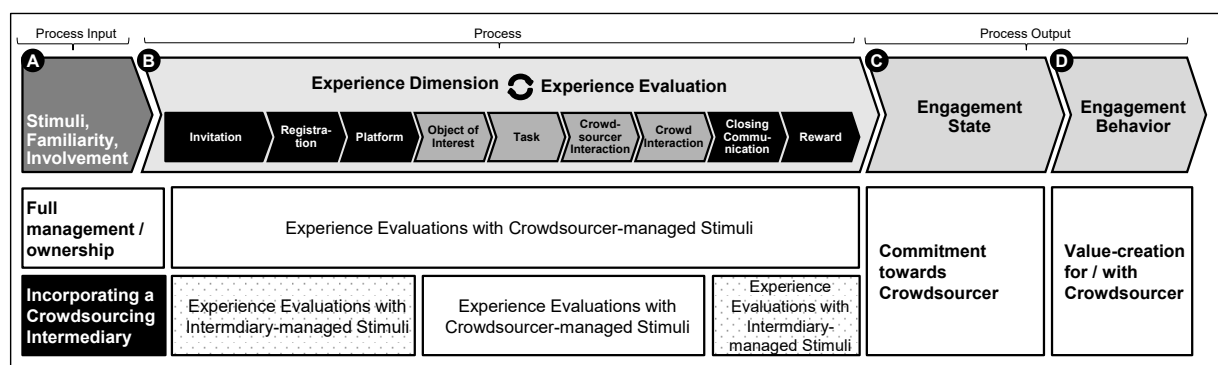


Figure 16. Crowdsourcing Engagement Process & Crowdsourcing Intermediary

Source: Own Illustration

As mentioned before, crowdsourcing intermediaries are mostly responsible for stimuli related to crowd-acquisition (e.g., identifying and approaching a suitable crowd), platform

provision and management, any administrative communication before and after the project, and taking care of compensation or benefit provision.

This research aims to find out in how far engagement processes, especially in form of value-creation that benefits the crowdsourcer, are affected when incorporating a crowdsourcing intermediary.

4.3 Methodology

As this research aims to find out in how far engagement processes are affected when incorporating a crowdsourcing intermediary, the investigation of contrasting cases with different crowdsourcing set ups seems most intuitive. Therefore four common crowdsourcing cases were deliberately selected that offered contrasting management situations, while being comparable in all other parameters (Yin, 2013). This study builds entirely on the data and data assessment, presented in Chapter 3. All details related to the cases, data collection and analysis work can be read in Chapter 3.

The four cases of the multiple case study can be divided into mediated and non-mediated cases. InsureCorp (A) and TelcoCorp (D) incorporated a crowdsourcing intermediary that was responsible for acquiring the consumer-crowd, providing the crowdsourcing platform on which registration and all interactions took place, and for any form of closing communication of the project and the compensation transfer. Hence, the crowd was in touch with intermediary-managed stimuli such as the project invitation, registration, crowdsourcing platform and reward processing as well as with crowdsourcer-managed stimuli (see Figure 17 for details).

In contrast, RetailCorp (B) and MobilityCorp (C) did not incorporate an intermediary and instead provided and managed their own (partly improvised) crowdsourcing platform with registration and were responsible for all type of pre- and post-participation communication in addition to reward-processing, task provision and managing the object of interest.

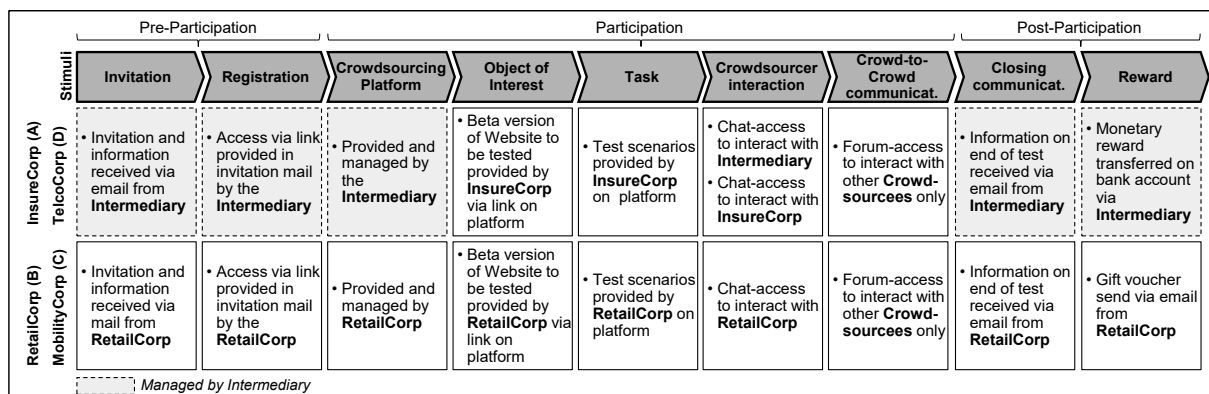


Figure 17. Mediated and Non-Mediated Crowdsourcing Journeys for Case A, B, C and D

Source: Own Illustration

4.4 Results

Looking at the synthesized data of the four cases (see Figure 18), it can be observed that the two mediated cases, InsureCorp and TelcoCorp, received slightly more negative experience evaluations (i.e., 21 percent each) compared to the two non-mediated cases, RetailCorp and MobilityCorp (i.e., 19 and 13 percent) throughout the crowdsourcing journey. However, affective commitment formation towards the crowdsourcer and project was even slightly stronger for the mediated cases (56 and 63 percent) than the non-mediated cases (43 and 50 percent), despite more negative experience evaluations.

Stimuli	Pre-Participation Phase			Participation Phase			Post-Participation Phase			End State	
	Invitation	Registration	Crowdsourcing Platform	Object of interest	Task	Crowdsourcer interaction	Crowd-to-Crowd communicat.	Closing communicat.	Reward	Commitment	
InsureCorp (A)	A1	0	0	0	1	-3	-	-	-1	0	NC
	A2	2	-1	0	2	3	1	-	1	0	ACC
	A3	1	0	-2	1	2	1	-	-1	0	ACC
	A4	1	0	-2	2	0	1	0	0	-2	ACC
	A5	0	0	-1	0	-2	-	-1	0	0	NC
	A6	1	-1	-1	1	2	1	0	0	0	ACC
	A7	0	0	0	1	0	0	-0	-1	0	CC
RetailCorp (B)	B1	1	0	-1	0	-0	-	0	0	0	CC
	B2	1	0	0	1	1	-	0	2	0	ACC
	B3	1	0	-1	2	1	1	1	1	0	ACC
	B4	1	0	-2	1	-2	-1	0	-2	0	NC
	B5	1	0	0	3	1	1	0	1	0	ACC
	B6	1	-1	-1	0	-0	0	0	1	0	CC
	B7	0	-1	-1	0	-0	0	0	0	0	CC
MobilityCorp (C)	C1	2	0	-3	0	0	-	0	0	0	CC
	C2	2	0	-3	0	0	1	2	-2	0	ACC
	C3	2	0	0	1	1	0	-	0	2	ACC
	C4	2	0	0	2	1	0	0	0	0	ACC
	C5	1	0	0	1	0	1	0	1	0	ACC
	C6	2	0	-3	0	-2	-1	0	0	-1	NC
	C7	2	0	0	0	0	-1	0	-2	0	CC
	C8	1	0	0	1	0	0	-0	0	0	CC
TelcoCorp (D)	D1	0	-1	-1	0	0	3	0	1	0	ACC
	D2	1	0	-1	1	1	-2	0	-3	0	NC
	D3	1	0	-1	3	1	1	-	1	0	ACC
	D4	0	0	-1	1	2	1	0	2	0	ACC
	D5	0	0	0	0	-1	-1	-2	-1	0	NC
	D6	1	-1	-1	1	1	2	0	0	-1	ACC
	D7	0	0	0	2	0	2	1	0	0	ACC
	D8	0	0	-1	2	0	0	0	0	0	CC

Managed by Intermediary

A/B/C/D/# = Interviewee ID of each Case

0 = Contentment / Calmness

1 = Pleasant / Relief

2 = Delight

3 = Elation

-0 = Boredom

-1 = Displeased

-2 = Disappointment

-3 = Frustration

-X

X

-X

0

= Dominant Negative Driver

= Dominant Positive Driver

= Offset Negative Experience

= Dominant Neutral Experience

NC = No Commitment

CC = Calculative Commitment

ACC = Affective & Calculative Commitment

Figure 18. Overview of Satisfaction Responses and End-States across Contrasting Cases

Source: Own Illustration

4.4.1 Mediated Cases (A & D)

A closer look at case A (InsureCorp) and D (TelcoCorp) shows that the majority of interviewed crowdsourcers were disappointed from the crowdsourcing platform and

unhappy with the registration process, and / or the reward-process. Those intermediary-managed stimuli were identified as so-called risk-factors in the prior chapter, meaning that they either arouse negative emotions or lead to neutral states due to more clearly pre-defined expectations. In addition, some crowdsourcees were also displeased or even frustrated with the closing communication that was sent by the intermediary to the crowd. This intermediary-managed stimulus was identified to be a game changer due to its potential to over- and under-fulfill expectations, leading to positive or negative emotional arousal. Thus it is assumed to strengthen engagement formation but was not found to have a dominant impact on engagement. Consequently, a positive or negative experience alone with this stimulus is not sufficient to enable or destroy commitment.

Crowdsourcer-managed stimuli such as the object of interest, task and crowdsourcer-interaction via the support and feedback channel were mostly positively evaluated and aroused at least some emotions. Task and crowdsourcer-interaction were identified as so-called *game changers* in the prior study, meaning that they can arouse negative emotions when they underperform compared to expectations, but also positive emotions when they exceed expectations. Therefore, those stimuli are supposed to have a dominant effect on engagement formation and the capability to offset negative experiences with other, less dominant stimuli.

When looking at the commitment states at the end of the individual *crowdsourcing journeys*, it can be observed that different states developed towards the crowdsourcer and the intermediary. As outlined in Chapter 3, commitment states that were directed towards the crowdsourcers (i.e., InsureCorp and TelcoCorp) were found to be mostly of affective nature due to the positive experiences with the task and crowdsourcer-interaction. Those crowdsourcees described diverse value contributions, like return-intentions for further projects, referral and word of mouth, a desire for additional contributions without monetary reward, willingness to use the test object in future, consumption-intentions as well as an interest in observing the further development of the website. In contrast, final evaluations regarding the intermediary were rather neutral and no signs of affective commitment could be detected.

Instead crowdsourcees described the intermediary more as a “means to an end” and a necessary middle man that takes care of the administrative part of the process. Most mentioned that they were not entirely satisfied with stimuli-perceptions, which seemed to have impacted the overall experience evaluation. If at all, some participants may have developed some form of calculative commitment towards the intermediary (even if they were unhappy with their performance) due to the time they invested in learning the process and platform characteristics for efficiently participating in crowdsourcing projects.

Commitment evaluation towards crowdsourcer	A2: “Now, [InsureCorp] feels more like a partner for me. [...] yes, I told colleagues about the project and also would recommend participation to everyone, generally interested in UX or in the product itself.” A4: “I feel, [InsureCorp] is very interested in its customers and wants to serve those best. That’s why they team up with us” A6: “I feel, I got to know them really well by that. Actually, next time I need to renew my insurance, I would have a look at their site. They seem very supportive. They responded within minutes to my questions. I bet they do the same for their clients.” D1: “I would say the whole experience was so lala and I initially participated because it was easy money. But I liked how [TelcoCorp] did everything to support me and even solved my account issue thing. Their customer orientation is unusual! I would do it again for sure, although I still don’t care about the TV app.” D4: “It was fun. I liked exploring the app and all that. The submission system was not ideal, but it’s not [TelcoCorp] fault. I sent feedback to the platform provider and suggested to do a test-project for their own product (laughs).”
Commitment evaluation towards intermediary	A2: “The intermediary is for me more a means to an end. I don’t care too much about it.” A4: “Well, [InsureCorp] needs someone to support them, I guess. They have their reasons why they picked this one.” A6: “They try their best to make our job easier but they are not the main reason for participating. Although, it’s easier to work with the same platform and provider over time. I learned how to use it.” D1: “For me, they are just the ones who provide me with the money, which is actually not such an easy process. At least, now I know how it works.” D4: “They didn’t do a great job. I would prefer if [TelcoCorp] involves another platform provider or build their own for their next project.”

4.4.2 Non-Mediated Cases (B & C)

Similar as for the mediated cases, a closer look at the non-mediated cases B (RetailCorp) and C (MobilityCorp) shows that the majority of interviewed crowdsourcees were displeased, disappointed or even frustrated with the crowdsourcing platform and unhappy with the registration process. Also, some crowdsourcees were disappointed with the closing communication.

The object of interest, task and crowdsourcer-interaction via the support and feedback channel were partly positively evaluated and aroused at least some emotions for about half of the interviewed crowdsourcees (43 and 50 percent). However, both, for case B and C, compared to case A and D, it is observed that less of the negative evaluations of *risk factors* can be offset due to less positive experiences with dominant engagement-driving stimuli for most journeys. This seems also to be reflected in the commitment that formed towards the crowdsourcer.

When looking at the commitment states at the end of the individual *crowdsourcing journeys*, it can be observed that four out of seven (case B) and four out of eight (case C) participants developed no or only a form of calculative commitment towards the crowdsourcer. Calculative commitment was developed due to an interest in the reward and perceived utility through support of a product that is of use to them. No commitment developed due to boredom related to the task, missing impact and a perceived unprofessional service throughout the crowdsourcing journey, including the platform performance.

In contrast, those who developed a form of affective commitment, were delighted about the object of interest and the communication with the crowdsourcer throughout the process. They reported a strong affective relationship with the crowdsourcer.

Commitment evaluation towards crowdsourcer	B2: "I feel much closer to them, after this. I'm also seeing them around now way more often! I told my friends about it and also that I help improving the online shop." B5: "[RetailCorp] is such a nice and carrying company and they really try to catch up with the online world although they have such a traditional business. I will definitely try the online shop." C2: "We are here to help [MobilityCorp] and the result looks great. I hope they launch more projects like this." C3: "I definitely would join another time. It's a great initiative. I also convinced my partner to join."
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4.5 Discussion

A closer look at the *crowdsourcing experiences* and related engagement processes of mediated and non-mediated cases revealed that in general, affective commitment can be formed in both set ups. Surprisingly, in mediated cases an even stronger affective commitment developed towards the crowdsourcer, while commitment towards the intermediary was either not developed or of a purely rational nature.

One explanation for those observations is that intermediary-managed stimuli mainly belong to the category of *risk factors* (registration, platform, reward), with high potential of negative arousal, while the stimuli managed by the crowdsourcer are *game changers* (task and crowdsourcer-interaction) and *value adders* (test object), both with the potential of arousing high levels of positive emotions. Thus, if crowdsourcers evaluate crowdsourcer-managed stimuli positively, this relates directly to the overall experience evaluation regarding the crowdsourcer (Oliver, 1993) and chances are high that an overall positive and emotional commitment state develops as well (Verhoef, 2003). In contrast, when crowdsourcers evaluate experience evaluations with intermediary-managed stimuli, in the best case this leads to neutral states or even negative intermediary states which results in no commitment or calculative commitment.

A precondition for this is that in a mediated setting, crowdsourcers are able to differentiate stimuli-related experiences, so that they are generally able to draw separate conclusions regarding their engagement towards the different parties. In such a setting, negative evaluations, which are especially probable with stimuli like *risk factors*, can be absorbed by an intermediary when outsourced to them.

Hence, crowdsourcers, who incorporate intermediaries, theoretically have the potential to generate a desired commitment state, when recognized and perceived stimuli under their control belong to the group of *game changers* (e.g., task) and *value adders* (e.g., test object) and the intermediary mainly controls *risk factors* (e.g., platform interface). In this context, crowdsourcers may minimize their effort while maximizing the engagement potential by proactively designing and managing *game changers* and *value adders* under their control, with the goal of arousing positive medium to high emotions.

Based on these observations the following generalized propositions can be made:

Generalized Proposition:

In mediated crowdsourcing set ups,

- (a) **commitment formation towards the crowdsourcer** is proposed to be unrelated to experience evaluations with intermediary-managed stimuli, when crowdsourcers are able to differentiate experiences related to the different parties.
- (b) **affective commitment formation towards the crowdsourcer** is possible when the crowdsourcer is in control of *game changers*.

4.6 Limitations

The same limitations as mentioned in Chapter 3 apply also for the context of this study. Here provided propositions were formulated in a way that they are generalizable to other crowdsourcing contexts in order to explore and test them further with different types of projects and set-ups. Yet, as in Chapter 3 mentioned, insights need to be treated with care as empirical observations are based on two contrasting crowdsourcing set ups with a total of 30 interviews as a database. For future research, it is recommended to verify proposed relationships with further qualitative and quantitative research. Controlled experiments with contrasting set ups may be conducted to observe effects in isolation.

4.7 Conclusion

This study is among the first that deals with the question in how far engagement processes are affected when incorporating a crowdsourcing intermediary. Observations from contrasting cases showed that by involving an intermediary, crowdsourcers are not only able to outsource part of the work of managing the initiative, but also to shift risk regarding potential threats to the intermediary, while increasing their chance of fostering engagement towards the enterprise, when focusing on a targeted design and execution of their high-potential stimuli. Yet, this requires the ownership of stimuli to be recognizable for crowdsourcers.

Applying the engagement concept to the case of mediated and non-mediated crowdsourcing is a first step in offering researchers and practitioners a new perspective on the holistic evaluation of crowdsourcing activities and the support of decisions regarding outsourcing questions.

The engagement process model that was proposed in Chapter 2 (Figure 4) and extended with valuable findings related to dominant engagement drivers in Chapter 3 (Figure 15), can now be enriched by the insights presented in this chapter. Figure 19 shows the proposed process input, process and process output factors, related to the incorporation of intermediaries that were identified in the prior assessment.

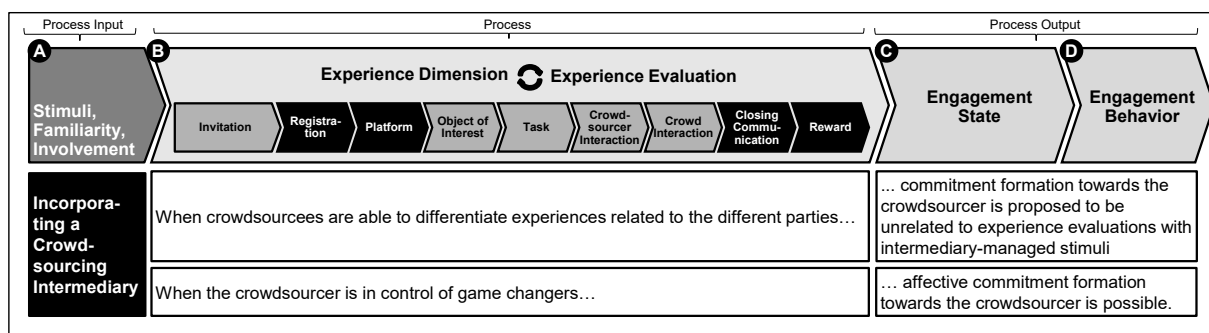


Figure 19. The Role of an Intermediary for Engagement Formation

Source: Own Illustration

Chapter V

Deep Dive II: Role of the Reward

*Why Providing a Monetary Reward Can Increase
Crowdsourceses' Engagement*

5 Why Providing a Monetary Reward Can Increase Crowdsourcers' Engagement

This Chapter reacts to the second part of research question three, by presenting the insights from the second deep dive study on the role of monetary incentives for engagement formation. It provides a theoretical background about the different types of crowdsourcing rewards in general and comes up with some early assumptions on the impact on engagement formation. Contrasting cases are presented to reveal differences between engagement formation processes of crowdsourcers, who expected a financial reward and those who did not. The chapter concludes by providing an enriched process model that considers the existence of a monetary reward.

5.1 Introduction

Crowdsourcing has emerged as an efficient and effective way to gain access to a diverse crowd that can solve a wide range of tasks. While some crowdsourcing projects are more of an unstructured and organic nature without a defined owner and manager (e.g., Wikipedia and open source projects), many other projects follow a more commercial strategy and provide a structured environment with pre-defined tasks and outcomes, in which the crowd is motivated and incentivized to solve those specific tasks. Across projects, many forms of incentives and motivators can be found. Some projects rely on monetary rewards, while others offer learning or networking opportunities and other forms of entertainment to keep the crowd going.

At first sight, paid crowd work (i.e., projects with monetary rewards) seems effective, as it offers the crowdsourcer a mechanism to control participation, quantity and quality of contributions (Durward et al., 2016). However, if workers are motivated solely by monetary compensation, economic theory predicts that they will shirk to maximize benefits (Mao et al., 2013). For example, for the majority of workers on the Amazon Mechanical Turk platform (on which they get paid a fixed amount per task), it was observed that tasks were completed as fast as possible and of minimal quality, with the goal to solve as many of them as possible to maximize overall compensation per hour (Mao et al., 2013). Also, as many crowdsourcers still lack the experiences in this new field of outsourcing work to an external crowd, the type and amount of compensation that can or should be offered is often not clear.

Beside of that, prior studies found that intrinsic motivation (i.e., the willingness and drive to complete a task for other reasons than financial reward) is positively related to overall satisfaction with the participation in the project (Brawley & Pury, 2016). It was recommended that, whenever possible, crowdsourcers should foster intrinsically motivators to increase satisfaction responses, which eventually may lead to long term contribution.

Looking at the key findings of Chapter 3, the initial communication (i.e., an invitation to the crowdsourcing project), containing information about the benefits that can be received in return for solving the task, were identified as *door openers*. That is, this initial communication must arouse positive emotions or at least a neutral state at the very beginning of an interaction process to motivate a crowdsourcee to actually take part in the initiative. It can be understood as an opportunity to convince and win crowdsourcees, and to set expectations for the rest of the *Crowdsourcing Experience*. Nevertheless, the provision of the actual reward at the end of the crowdsourcing journey was identified as a potential risk factor. That is, in the best case the provision of the reward fosters a neutral state in line with clear expectations, while negative experience perceptions can lead to negative emotional arousal.

Based on the slightly contradictory insights from the literature and the multiple case study on relevant engagement drivers along the crowdsourcing journey, among consortium partners the question arose in how far the type of incentive promised and provided to

crowdsourcers' benefits or hurts crowdsourcers' engagement formation. Consortium partners assumed that crowdsourcing projects with financial rewards attract mostly extrinsically motivated crowdsourcers, who are per definition more interested in the reward than the task or the crowdsourcer itself. A per se lower level of initial motivation is expected to result in lower engagement in form of affective commitment formation throughout the rest of their *crowdsourcing journeys*.

While first studies dealt with the question of how the type and magnitude of financial incentives affects the outcome produced; the question of how monetary rewards influence crowdsourcers' psychological and behavioral responses (i.e., referred to as engagement in this thesis) within and after the interaction process has not been addressed by research yet. Apart from the theoretical relevance of studying the effect of compensation on behavior and attitudes in a socio-technical system, findings support management decisions on how to effectively incentivize crowdsourcers to strategically support engagement formation throughout the process. Hence, the following research question guides this chapter:

How and why do monetary incentives affect crowdsourcers' engagement formation?

Similar as the deep dive about the role of intermediaries, presented in Chapter 4, this study builds on the data and analysis work from the multiple case study, presented in Chapter 3. Out of the four cases, two provided fixed monetary incentives, which were communicated at the beginning of the crowdsourcing journey to all crowdsourcers (i.e., InsureCorp and TelcoCorp). The other two (i.e., RetailCorp and MobilityCorp) provided non-monetary incentives in form of a gift voucher and gamification feature to reward crowdsourcers at the end of the journey. This study takes a closer look at the engagement journey and identifies potential differences that go beyond the categorization of generally favorable and less favorable stimuli experiences (as presented in Chapter 3).

Against expectations and intuitions, crowdsourcers who expected and received monetary rewards sensed stronger emotional arousal throughout the rest of the *crowdsourcing journeys* and developed even more often affective commitment towards the end, potentially due to lowered initial expectations regarding the overall *crowdsourcing experience*.

This study aims to

- (1) Provide an overview of the *types and roles of incentives* within crowdsourcing projects from literature and illustrate their strategic placement in the engagement process model.
- (2) Compare findings from *four contrasting cases*, i.e. two with and two without the provision of monetary incentives, to identify potential differences in terms of crowdsourcers engagement formation.
- (3) *Derive propositions* on the impact of expecting and receiving monetary incentives on engagement formation and *provide an extended model* of the engagement process and recommendations for crowdsourcers on when/how to use incentives.

5.2 Crowdsourcing vs. Crowd Work

When discussing the role of rewards, in their integrated crowdsourcing definition, Estellés-Arolas and González-Ladrón-De-Guevara (2012) conclude that the recompense can vary depending on the crowdsourcer, but should always look to satisfy one or more of the individual needs mentioned in Maslow's pyramid: economic reward, social recognition, self-esteem or to develop individual skills. They also mention, that the reward is always given by the initiator of the crowdsourcing initiative (crowdsourcer), although there can be secondary rewards, like social recognition from other crowdsourcing participants.

Furthermore, Geiger et al. (2011) distinguish between three types of rewards: fixed, success-based, and no remuneration. Fixed remuneration means that all contributions that adhere to the respective terms and conditions generate a fixed payment regardless of their value to the final outcome. Success-based remuneration means that contributions will be paid depending on their individual value to the crowdsourcing goal. In these cases, sometimes only the winning contribution is paid for. Besides fixed and success-based payment, some crowdsourcing processes offer no remuneration at all and, thus, completely depend on other mechanisms to attract contributors.

Durward et al. (2016) differentiate between voluntary and financially remunerated crowdsourcing projects, while referring to the latter as Crowd Work. They define Crowd Work as a digital form of gainful employment, in which an undefined mass of people creates digital goods via an open call and the remuneration of the Crowd Workers completes the project (Figure 20Figure 20).

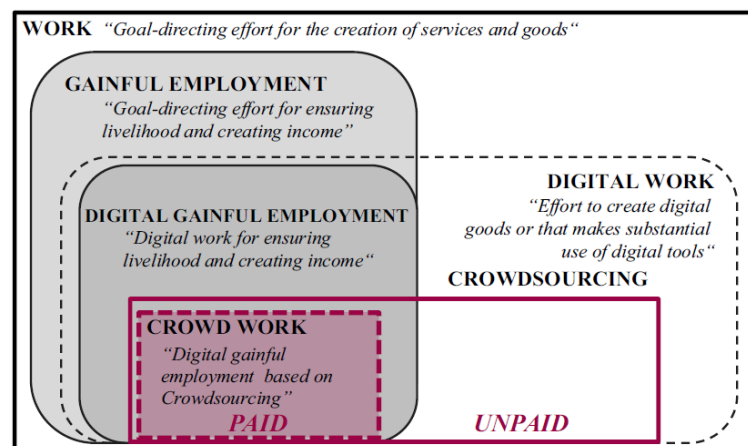


Figure 20. Classification of Crowd Work

Source: Durward et al. (2016)

Related dimensions in the academic literature are mainly concerned with the amount or the exact form of the payment, its impact on performance and the overall motivation of crowdsourcees. It is assumed that crowdsourcees in unpaid crowdsourcing systems are driven by different motivations than crowd workers of paid crowdsourcing platforms (Mao et al., 2013). Volunteer crowdsourcees may seek different objectives, such as entertainment,

skill development or social interaction and some may be more knowledgeable about a specific task than workers in paid systems. This is often referred to as intrinsic motivation, by which individuals act in a particular way because they enjoy the act in itself (Deci, 1972) or as internalized extrinsically motivation, by which individuals perform certain behaviors due to internalized benefits that they learned from prior experiences (Ryan & Deci, 2000). An example for an intrinsic motivator in the crowdsourcing context is a playful task that is perceived as fun (Füller, 2010). Anything that drives status development or social recognition, like public announcement of a major contributor or gamification elements can be understood as internalized extrinsic motivators.

In comparison, paid crowd workers, who are aware of the monetary reward, are assumed to be driven by the reward and sometimes also other, secondary benefits that can be similar to volunteer crowdsourcers (Mao et al., 2013). Being driven predominantly by the reward is related to the concept of extrinsic motivation, by which people act in order to receive something else, most of the time something of tangible nature, than the mere satisfaction of performing the act (Deci, 1972). In this context, prior research has focused mainly on how the type and magnitude of financial incentives affects the outcome produced.

Many contradictory findings can be found in the literature. Zhao and Zhu (2014), for example, found that the motivation to gain financial rewards was significantly associated with participation effort. Similarly, Mao et al. (2013) found that workers completed more tasks for a higher fixed payment, but that quality did not improve. Yet, Yin, Chen, and Sun (2013) found a positive relationship between increasing payments and increased quality of work, while Shaw, Horton, and Chen (2011) concluded that higher quality work is produced in situations where workers' payments rather depend on the responses of their peers. In this context, Khoi, Casteleyn, Moradi, and Pebesma (2018) observed that in general, monetary incentives work to improve participation rate, while a general descending order regarding the effectiveness of the reward mechanisms were established, ranging from fixed micro-payment (with greatest effect), to lottery-style payout and finally variable micro-payment (with lowest effect). Similar results were found by Rula, Navda, Bustamante, Bhagwan, and Guha (2014), who also compared participation rate with weighted lottery and micro-payments (i.e., both incentive mechanisms provided sufficient motivation for participants, but micro-payments were more effective). Lee, Chan, Ho, Choy, and Ip (2015) showed that crowdsourcing projects with higher awards and social recognition as extrinsic and internalized extrinsic motivation were positively associated with the quantity of solution, while monetary rewards were more influential towards the amount of contributions and other types of motivators (e.g., recognition) were more influential regarding the quality of contributions. Based on their research, Mao et al. (2013) concluded that depending on the crowdsourcing set up, comparable performances between volunteers and appropriately paid workers can be achieved but different type of incentives and incentive structures may be used to trade off precision, recall, speed or total attention. It can be concluded, that despite contradictory findings across the literature, monetary rewards seems to have no negative impact on participants' general contribution behavior. A more comprehensive review and

meta-analysis, discussing the relationship between monetary incentives, extrinsic motivation and effort, is provided by Camerer and Hogarth (1999).

Nevertheless, as these examples show, existing research mainly looked at the final output, such as the contribution quality and quantity. However, the issue of how and why monetary incentives in comparison to non-monetary rewards influence crowdsourcees’ experiences and associated psychological and behavioral responses before, within and after the interaction process, has not been addressed by research yet. In this study, the more foundational concept of engagement is assessed, which is supposed to be also a driver of motivation, behavior, and potentially performance. When discussing the topic of rewards and its potential effect on engagement formation with the consortium, the group of crowdsourcees, intermediaries and crowdsourcing experts, came to the following conclusion, which they found most intuitive:

- Crowdsourcing projects *without any financial rewards* are assumed to attract mostly intrinsically motivated crowdsourcees, who are per definition already more engaged and motivated to perform the task right from the beginning. Hence, a per se higher level of initial motivation is expected to also drive engagement in form of affective commitment formation throughout the rest of their *crowdsourcing journeys*.
- In contrast, crowdsourcing projects *with financial rewards* are assumed to attract mostly extrinsically motivated crowdsourcees (with some exceptions possible), who are per definition more interested in the reward (and to work for the reward) than the task or the crowdsourcee itself. Hence, a per se lower level of initial motivation is expected to result in lower engagement in form of affective commitment formation throughout the rest of their *crowdsourcing journeys*.

Looking at the initial model of the engagement process, proposed in Chapter 3, the type of incentive can be understood as a process input factor that is assumed to affect the experience evaluation. Figure 21 illustrates the provision of a non-monetary and a monetary incentive as a potential process input factor. The invitation, closing communication and reward provision are directly affected by a change in the reward form. The experience evaluation of other stimuli are expected to be affected, too. This research aims to shed light on this.

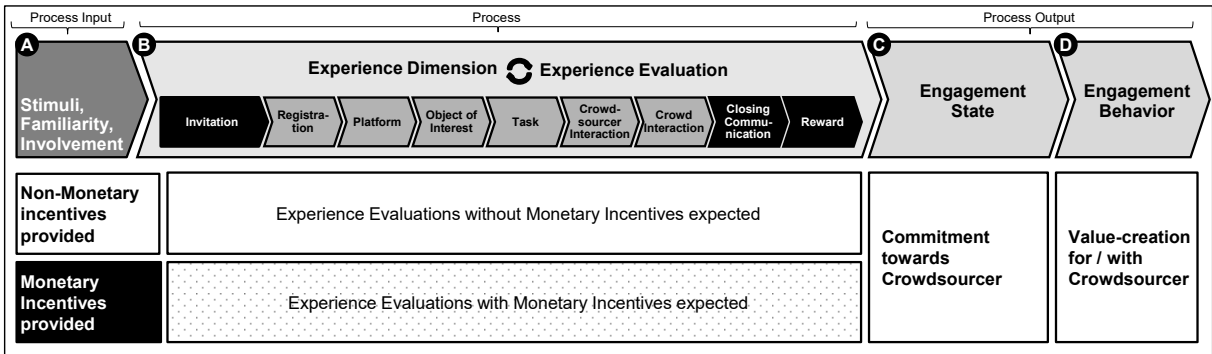


Figure 21. Crowdsourcing Engagement Process & the Role of Incentives

Source: Own Illustration

5.3 Methodology

Similar to the methodology described in Chapter 4, as this research aims to find out in how far engagement processes are affected when different types of incentives are promised, the investigation of contrasting cases with different crowdsourcing set ups seems most intuitive. Therefore four common crowdsourcing cases were deliberately selected that offered contrasting incentive situations, while being comparable in all other parameters (Yin, 2013). This study builds entirely on the data and data assessment, presented in Chapter 3. All details related to the cases, data collection and analysis work can be read in Chapter 3.

The four cases of the multiple case study can be divided into monetary and non-monetary compensated crowdsourcing cases. InsureCorp (A) and TelcoCorp (D) promised each crowdsourcer a fixed monetary reward at the beginning of the crowdsourcing journey (communicated in the invitation to participate). The closing communication contained instructions on how and when the reward is transferred. Reward provision is in both cases the last stimulus that crowdsourcers experience after participating in the project (see Figure 22 for details).

In contrast, RetailCorp (B) and MobilityCorp (C) did not provide a monetary incentive. Instead MobilityCorp incorporated a gamification feature on their platform. At the end of the project, crowdsourcers were able to receive badges for their contribution. Depending on the amount and quality of their contributions they received badges for being an innovation champion (e.g., when ideas were submitted), a bug-detector (e.g., when functional bugs were submitted) or a team player (e.g., when feedback via the commenting function was provided). RetailCorp provided shopping-vouchers at the end of the journey to all crowdsourcers. In both cases, incentives were communicated with the invitation to participate.

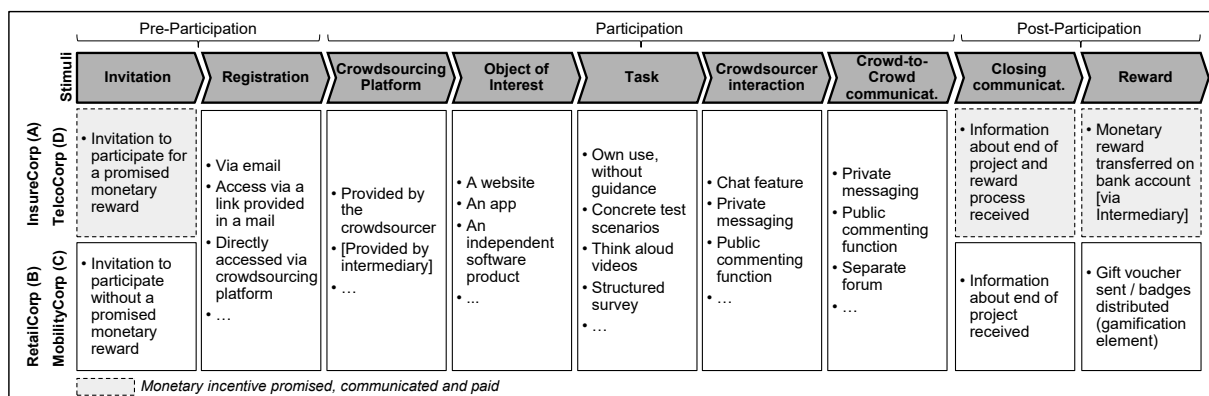


Figure 22. Monetary and Non-monetary Incentivized Crowdsourcing Journeys for Case A, B, C and D

Source: Own Illustration

5.4 Results

Looking at the synthesized data of the four cases (see Figure 23), it can be observed that at first glance, all entry states of participating crowdsourcers were either neutral or positively aroused. This seems intuitive, as by definition participation in a crowdsourcing project is voluntary and in response to an open call, posted by the crowdsourcer. In addition, crowdsourcers, who were selected for the study fell into the category of “average income” according to the Federal Statistical Office (i.e., not less than USD 62,283 per year). Meaning, it can be assumed that none of the crowdsourcers felt forced or urged to do something that they had a general negative attitude towards.

Stimuli	Pre-Participation Phase		Participation Phase					Post-Participation Phase		End State
	Invitation	Registration	Crowdsourcing Platform	Object of interest	Task	Crowdsourcer interaction	Crowd-to-Crowd communicat.	Closing communicat.	Reward	Commitment
InsureCorp (A)	A1	0	0	1	-3	-	-	-1	0	NC
	A2	2	-1	2	3	1	-	1	0	ACC
	A3	1	0	-2	1	2	1	-1	0	ACC
	A4	1	0	-2	2	0	1	0	-2	ACC
	A5	0	0	-1	0	-2	-	0	0	NC
	A6	1	-1	1	2	1	0	0	0	ACC
	A7	0	0	1	0	0	-0	-1	0	CC
RetailCorp (B)	B1	1	0	-1	0	-0	0	0	0	CC
	B2	1	0	0	1	-	0	2	0	ACC
	B3	1	0	-1	2	1	1	1	0	ACC
	B4	1	0	-2	1	-2	-1	-2	0	NC
	B5	1	0	0	3	1	0	1	0	ACC
	B6	1	-1	-1	0	-0	0	1	0	CC
	B7	0	-1	-1	0	-0	0	0	0	CC
MobilityCorp (C)	C1	2	0	-3	0	0	-	0	0	CC
	C2	2	0	-3	0	0	1	-2	0	ACC
	C3	2	0	0	1	1	0	0	2	ACC
	C4	2	0	0	2	1	0	0	0	ACC
	C5	1	0	0	1	0	1	1	0	ACC
	C6	2	0	-3	0	-2	-1	0	-1	NC
	C7	2	0	0	0	0	-1	0	0	CC
	C8	1	0	0	1	0	0	0	0	CC
TelcoCorp (D)	D1	0	-1	-1	0	0	3	1	0	ACC
	D2	1	0	-1	1	1	-2	-3	0	NC
	D3	1	0	-1	3	1	1	1	0	ACC
	D4	0	0	-1	1	2	1	2	0	ACC
	D5	0	0	0	0	-1	-1	-1	0	NC
	D6	1	-1	-1	1	1	2	0	-1	ACC
	D7	0	0	0	2	0	2	1	0	ACC
	D8	0	0	-1	2	0	0	0	0	CC

A/B/C/D/# = Interviewee ID of each Case

0 = Contentment / Calmness
1 = Pleasant / Relief
2 = Delight
3 = Elation

-0 = Boredom
-1 = Displeased
-2 = Disappointment
-3 = Frustration

-X = Dominant Negative Driver
X = Dominant Positive Driver
-X = Offset Negative Experience
0 = Dominant Neutral Experience

NC = No Commitment
CC = Calculative Commitment
ACC = Affective & Calculative Commitment

Figure 23. Overview of Satisfaction Responses and End-States across Contrasting Cases

Source: Own Illustration

Nevertheless, when taking a closer look at the data, it can be also observed that slightly more crowdsourcers, who decided to participate in projects with monetary incentives (InsureCorp and TelcoCorp), showed signs of a neutral state (43-71 percent of invitation-

evaluations). They mentioned a general interest in the task or test object, the low effort of doing it, and the compensation they could receive.

In comparison, crowdsourcers, who decided to participate in projects without monetary incentives showed way more less signs of neutral states (0-14 percent of invitation-evaluations). Instead, more participants from RetailCorp and MobilityCorp showed a higher state of positive emotional arousal (i.e., pleasant and delight) e.g., due to an unexpected excitement about the type and purpose of the task, the relevance of the object in the center of the task and the crowdsourcer itself.

Initial state: Neutral (0)	A7: “I was curious to see what [InsureCorp] wanted to get tested. I like getting to know new things. I didn’t expect or feel anything specifically at that time.” B7: “I thought it doesn’t take a lot of time and it won’t hurt me. I did it in the past a few times already for [RetailCorp], so why not again.” D7: “I signed up for some reason. I don’t remember anymore. When I got an invite – I guess because I have this TV thingy and they were looking for customers of it – I thought I can try it out and maybe it’s easy work for some good money.”
Initial state: Emotionally aroused (1-2)	A2: “I was surprised about the think-aloud videos, I never had this. (...) I felt excited to try that out!” B2: “I felt kind of honored when I got the invite. I know the online shop is not very famous yet, but helping [RetailCorp] to make it better sounded like a good idea.” C3: “The app is quite important to me for my day-to-day commute. I was excited to be part of a group that helps to make it better, especially as often projects like these are only for experts. Here, even dummies like me could take part!” D6: “I was looking forward towards testing the new app and providing my feedback and so. It’s fun and helps the next generation of users.”

When looking at the rest of the journeys of the crowdsourcers from the two types of crowdsourcing cases, two more patterns can be observed. First of all, crowdsourcers with initially promised monetary incentives (Case A and D) sensed slightly stronger emotional arousal (i.e., +/- 2 and 3) throughout their *crowdsourcing journeys* (15-16 percent of stimuli evaluations), compared to crowdsourcers with non-monetary incentives (10-13 percent of stimuli evaluations). Especially the crowdsourcing platform, task and object of interest and crowdsourcer support evoked stronger emotional arousal. Secondly, and even more

interestingly, crowdsourcees with initially promised monetary incentives showed stronger positive emotional arousal (i.e., delight and elation) during the rest of their journeys (8-11 percent of stimuli evaluations), compared to crowdsourcees with non-monetary incentives (4-5 percent of stimuli evaluations). This is foremost related to stimuli like the task, object of interest and crowdsourcer support.

Lastly, when looking at the commitment states, it is observable that more crowdsourcees, who received monetary incentives for their contributions, developed affective commitment states (57-63 percent) and less neutral or rational end-states (13-14 percent). This was mostly due to unexpected positive experiences throughout the journeys, related to the task, the object of interest and the crowdsourcer-interaction. In comparison, among the crowdsourcees, who did not receive monetary incentives, less developed affective commitment (43-50 percent) and instead more rational commitment states were observed (38-43 percent). Those, who showed no signs of affective commitment described *crowdsourcing experiences* that were below their expectations and an imbalance between the efforts they put in, compared to the benefits they got out from contributing to the projects.

Commitment states of crowdsourcees with monetary incentives	A2: “Now, [InsureCorp] feels more like a partner for me. [...] yes, I told colleagues about the project and also would recommend participation to everyone, generally interested in UX or in the product itself.” A4: “I feel, [InsureCorp] is very interested in its customers and wants to serve those best. That’s why they team up with us” A6: “I feel, I got to know them really well by that. Actually, next time I need to renew my insurance, I would have a look at their site. They seem very supportive. They responded within minutes to my questions. I bet they do the same for their clients.” D1: “I would say the whole experience was so lala and I initially participated because it was easy money. But I liked how [TelcoCorp] did everything to support me and even solved my account issue thing. Their customer orientation is unusual! I would do it again for sure, although I still don’t care about the TV app.” D4: “It was fun. I liked exploring the app and all that. The submission system was not ideal, but it’s not [TelcoCorp’s] fault. I sent feedback to the platform provider and suggested to do a test-project for their own product (laughs).”
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Commitment states of crowdsourcees without monetary incentives	B4: “No, I wouldn’t participate again! I found this whole process way to unprofessional for such a big company that earns so much money. I mean, it’s a favor that I do for them!” C7: “This project was necessary and every time I open the app I’m happy to see new features coming out of the community. I stopped contributing at some point. [...] You cannot be sure if someone cares about your post.” C6: “I feel I did way too much for what I got out of it. I wouldn’t join again.”
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5.5 Discussion

A closer look at the *crowdsourcing experiences* and related engagement processes of crowdsourcees with monetary and non-monetary rewards revealed that in general, affective commitment can be formed in both set ups.

Consortium members and researchers assumed that crowdsourcees that participated in projects without monetary rewards had a stronger initial intrinsic or externalized intrinsic motivation and hence the potential to form more engagement throughout the journey, compared to those, who joined monetary incentivized projects and who tended to be more extrinsically motivated. Those were expected to form less affective commitment.

In line with expectations, it was found that crowdsourcees, who joined projects without promised monetary rewards, showed a higher initial state of positive emotional arousal and general involvement. This seems intuitive, as people who decide to voluntarily join need to be more enthusiastic about the project than those, who have an additional (extrinsic) incentive to join. Crowdsourcees need to view their decision to participate as personally relevant and important or expect to receive any other form of benefit throughout the journey. This is often also described as a goal-directed motivation (Mittal and Lee, 1989). Similar assumptions were made by De Vreede et al. (2013), who conceptualized personal interest and goal clarity as necessary conditions for initial engagement in crowdsourcing projects. However, they generalized this assumption, without considering different crowdsourcing-contexts and journey-designs. When looking at the cases where monetary incentives were promised (and received), crowdsourcees showed more neutral initial states. It seems as if it was not necessary for them to perceive their initial decision to participate as personally relevant and important, as they had the reward that served as an (extrinsic) motivation.

Nevertheless, against consortium’s and researchers’ expectations, surprisingly crowdsourcees who expected and received monetary rewards sensed stronger emotional arousal throughout the rest of the *crowdsourcing journeys* and developed even more often affective commitment towards the end. One explanation for those observations is that by providing a reward for participating in the crowdsourcing project, the crowdsourcee’s

expectation related to the *crowdsourcing experience* itself is lowered. In contrast, the fact that crowdsourcees are compensated with a monetary incentive may signal that participation brings no or only limited other forms of value.

In general, expectations refer to the attributes or characteristics that a subject anticipates or predicts will be associated with an object or entity (Oliver, 1977). *Perceived performance* refers to the subject's perceptions of the actual performance (Oliver, 1977). According to expectation-confirmation theory, perceptions of performance are directly influenced by prior expectations, and in turn influence potential disconfirmation of beliefs and consequently the satisfaction response (Oliver, 1977; Oliver & De Sarbo, 1989). *Disconfirmation* of beliefs refer to the judgments or evaluations that a subject makes.

- On the one hand, when *expectations are not matched* by an object's actual performance, contrast theory presumes that the surprise effect (i.e., the contrast between expectations and outcome) can cause a subject to overstress the disparity, in a positive or negative way (Hovland, Harvey, & Sherif, 1957).
- On the other hand, assimilation-contrast theory suggests that if *performance is within a subject's range of acceptance*, even though it may fall short of expectation, the discrepancy will be disregarded, i.e., assimilation will operate and the performance will be deemed as acceptable.
- If *performance falls within the latitude of rejection* (i.e., no matter how close to expectation), contrast will prevail and the difference may be exaggerated.

The relationship of expectations, actual performance, perceived performance (i.e., contrast), the level of disconfirmation (i.e., acceptable or unacceptable), and the range of assimilation is illustrated in Figure 24 (Piqueras-Fiszman & Spence, 2015).

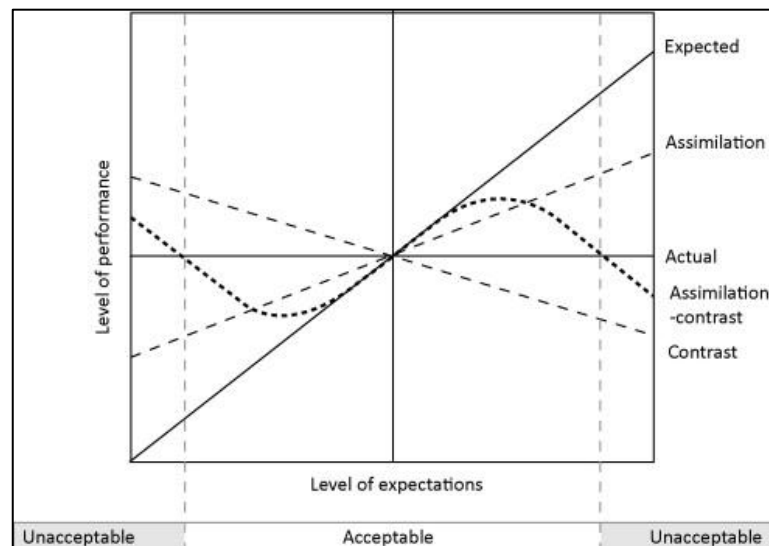


Figure 24. Expectation-Disconfirmation & Assimilation-Contrast Theory

Source: Piqueras-Fiszman and Spence (2015)

Everything that falls within the left part of the graph can be described as *positive disconfirmation* (i.e., expectations are lower than perceived performance), while everything that falls within the right part of the graph can be described as *negative disconfirmation* (i.e., expectations are higher than perceived performance). The middle illustrates the point where expectations are in line with performance.

Based on the observations of this study and the insights from the literature on expectancy theory, it is assumed that a promised monetary incentive lowers initial expectations related to the overall *crowdsourcing experience*, which then increases the chance for the crowdsourcer of actually meeting or even exceeding expectations. That is, perceived performance of stimuli throughout the rest of the journey are then more likely positively disconfirming with expectations (outside of the assimilation area) and hence delight or even elation are potential satisfaction responses. In contrast, when no monetary reward is offered, it can be assumed that crowdsourcees' initial expectations are much higher in the pre-participation phase. Thus, the risk of not exceeding or even meeting those expectations (also due to a stretched range of acceptance) is higher, too.

Based on that, the following generalized propositions are made:

Generalized Proposition:

- (a) the type of initial motivation (i.e., intrinsic or extrinsic) among crowdsourcees** is proposed to be unrelated to engagement formation throughout the rest of the crowdsourcing journey [i.e., initial extrinsic motivation among crowdsourcees is proposed to be no blocker and initial intrinsic motivation no guarantee for engagement formation].

In crowdsourcing set ups, where monetary rewards are promised and provided,

- (b) expectations regarding the overall Crowdsourcing Experience are lowered** due to the signal sent by the financial compensation.
- (c) an increased chance of positive emotional arousal sensed, resulting in affective commitment formation** due to accelerated expectation over-fulfillment, is proposed.

5.6 Limitations

The same limitations as mentioned in Chapter 3 and 4 apply also for the context of this study. Here provided propositions were formulated in a way that they are generalizable to other crowdsourcing contexts in order to explore and test them further with different types of projects and set-ups. Yet, as in Chapter 3 and 4 mentioned, insights need to be treated with care as empirical observations are based on two contrasting crowdsourcing set up with a total of 30 interviews as a database. For future research, it is recommended to verify the

proposed relationships with further qualitative and quantitative research. Controlled experiments with contrasting set ups may be conducted to observe effects in isolation.

5.7 Conclusion

This research study is among the first that deals with the question in how far engagement processes are affected by the type of reward offered to crowdsourcers.

Observations from contrasting cases show that crowdsourcers, who promise and provide monetary rewards, may have a higher chance of exceeding initially lower expectations and arousing positive emotions. This, in return, may then increase the likelihood of affective commitment state formation. At the same time, even when actual performance is lower, the risk of creating strong negative emotions, such as disappointment, is also lowered by that. Combining those assumptions with the findings from other studies, focusing on crowdsourcers' contribution quantity and quality with monetary incentives, it can be concluded that the positive effects of providing sufficient and fair amounts of monetary rewards maybe twofold: increasing productivity and commitment formation.

Applying the engagement concept to assess the impact of monetary and non-monetary compensation in crowdsourcing projects is a first step in offering researchers and practitioners a new perspective on the holistic evaluation of crowdsourcing activities and the support of decisions regarding compensation questions.

The engagement process model that was proposed in Chapter 2 (Figure 4) and extended with valuable findings related to dominant engagement drivers in Chapter 3 (Figure 15) and 4 (Figure 19), can now be enriched by the insights presented in this Chapter. Figure 25 shows the proposed process input, process and process output factors, related to the incorporation of monetary rewards that were identified in the prior assessment.

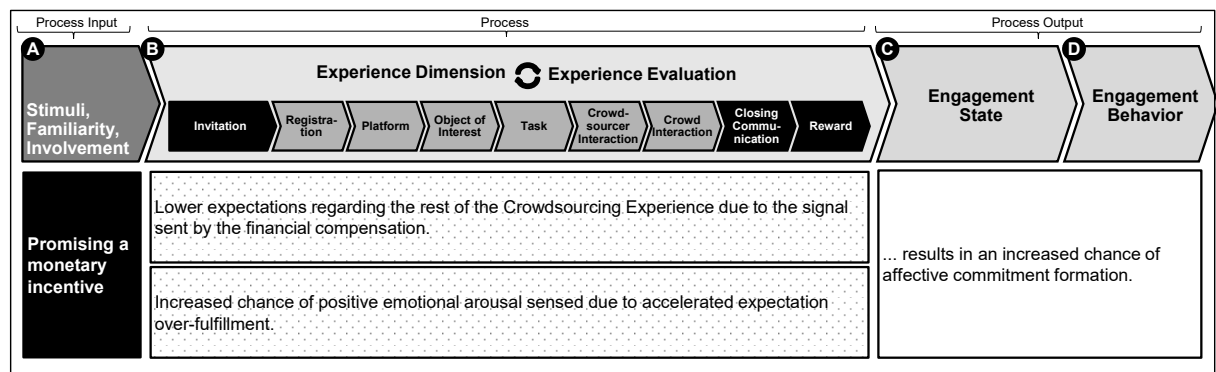


Figure 25. The Role of Monetary Rewards for Engagement Formation

Source: Own Illustration

Chapter VI

Deep Dive III: Role of Social Interactivity

*Arouse Your Crowd! The Dual Role of Social
Interactivity for Crowdsources' Engagement*

6 The Dual Role of Social Interactivity for Crowdsourceses' Engagement

This Chapter reacts to the third part of research question three, by presenting the insights from the last deep dive study on the role of social interaction for engagement formation. It provides a theoretical background about the role and potential benefits of perceived social interaction within the crowdsourcing journey. Based on prior findings from the multiple case study as well as the insights from a comprehensive literature review, hypotheses are formulated and tested with log-data and further explained with interview studies. The chapter concludes by providing an enriched process model that considers different types of social interactions.

This Chapter is based on the following publication⁴:

Troll, J. (2018). Arouse Your Crowd! The Dual Role of Social Interactivity for Crowdsourceses' Engagement. In: Academy of Management Annual Meeting (AOM). Chicago, Illinois, USA.

⁴ This chapter is a significantly modified and further developed version of the here mentioned (single author) publication for the purpose of this monograph. The qualitative data base was enriched with additional data. A different analysis approach was applied, which led to new insights and an enhanced discussion with novel propositions.

6.1 Introduction

Specific experiences throughout the crowdsourcing journey are assumed to dominantly impact the engagement process of crowdsourcees. In Chapter 3, *game changers*, which are stimuli that have the potential to arouse all types of satisfaction responses (i.e., even highly positive and negative ones), were proposed to have substantial impact on the subsequent stimuli evaluations as well as the overall commitment state.

Next to the *crowdsourcing task*, *crowdsourcer-interaction* or more precisely formulated *Initiator-to-Crowd (I2C) interaction* before, during and after the participation phase, was observed to be a potential *Game Changer*. Experiences with stimuli like *I2C-interaction* are rather variable for each crowdsourcing campaign and expectations may be more loosely defined. In such a case, even for generally familiar crowdsourcees, crowdsourcer-interaction illustrates a novel experience each time it happens. Hence, those stimuli are assumed to play a key role as they are specifically demanded but also show potential for positive expectation disconfirmation and high arousal.

This was in line with what the consortium expected. Looking back at their expectations, interaction with the crowdsourcer was expected to be of high relevance for engagement formation, as it was assumed to have the power to build a personal relationship with crowdsourcees and keep the participation going. In comparison, *crowd-interaction* or more precisely formulated *Crowd-to-Crowd (C2C) interaction*, was not identified as a *game changer*, based on the data from the multiple case study. It did not show a dominant effect on the final commitment state. Yet, it may take the role of a *value adder*, meaning that exceptional positive and surprising experiences related to *C2C-interaction* can lead to positive satisfaction responses and enhance the overall *crowdsourcing experience*. No strong negative emotions could be observed, even when participants were not entirely satisfied with the interaction that they experienced. Assumable, because expectations are low or not well defined.

C2I and *C2C-interaction* can be summarized as *social interactions* (i.e., in contrast to mechanical interactions), a phenomenon that is especially assessed and discussed by the service and computer-mediated communication literature. Perceived *social interactivity* (i.e., a result of social interaction) is known to have the prospective of fostering individualized moments of high-quality interactions (Jiang, Chan, Tan, & Chua, 2010; Prahalad & Ramaswamy, 2004). Applying the *Uses and Gratification Framework* as proposed by Blumler and Katz (1974) and Herzog (1942), an even broader set of benefits is revealed that may explain its role as a potential *game changer*.

Beside of the qualitative explorations of the impact of several stimuli on engagement, presented in Chapter 3, empirical evidence and psychological explanations for the role of social interaction within platform-mediated engagement processes are still vague and limited (Bayus, 2013; Sun et al., 2012). Existing research shows contradicting findings and specifically no combined assessments of psychological and behavioral effects can be found

for the case of crowdsourcing. Some results illustrate that social interaction affected emotions but not behaviors (Boons, Stam, & Barkema, 2015; Martinez, 2015). Others found that peer-to-peer interaction positively impacted idea submission (Chen, Marsden, & Zhang, 2012) or that only repeated interaction had an effect (Chan, Li, & Zhu, 2015). Hence, due to its proposed relevance, this study reacts to the call for more in depth research on the role of social interaction for engagement formation by academics (e.g., Füller et al., 2009; Pedersen et al., 2013; Vuković, 2009) and the consortium. Two research questions are proposed as a guidance for the following study:

1. *What is the effect of I2C and C2C-interaction on crowdsourcees' response-behavior?*

2. *How does I2C and C2C-interaction stimulate psychological processes?*

This mixed-methods study is the first that quantitatively assesses the impact of social interaction (considering I2C and C2C-interaction) on engagement behavior over time, and qualitatively explores the underlying psychological mechanisms and perceived benefits. For that purpose, out of the consortium, the fully self-managed crowdsourcing project conducted by MobilityCorp was selected for a deep dive study. Log data analysis from 11,408 crowdsourcees and in depth interview data from 23 crowdsourcees uncovers surprising findings. Beside of confirming a significant long-term effect of social interactivity on several behavioral engagement metrics (e.g., number, length and diversity of crowdsourcees' platform activities); a short-term effort-shift from low to high-effort activities is discovered. Insights from interviews propose that social interaction fosters short-term satisfaction responses due to different types of perceived benefits, which then drive commitment towards the task (i.e., in the case of C2C-interaction) or the initiator (i.e., in the case of I2C-interaction). The logic of the yield-shift theory of satisfaction (Briggs et al., 2008) is applied to better understand how and why perceived benefits may have caused an effort-shift.

As a result, refined propositions and an advanced model of the positive impact of social interactivity on engagement formation is proposed. This chapter concludes that humanizing crowdsourcing platforms by fostering both forms of social interaction creates complementary value: it enhances initial platform activity and sustained loyalty across contributors, both necessary for holistic crowdsourcing success.

This study aims to:

- (1) Provide an overview of the *role of social interactivity* for crowdsourcing engagement from the literature.
- (2) *Propose testable hypotheses* of the effects of social interactivity on engagement behavior and psychological processes over time.
- (3) *Assess log-data* from a crowdsourcing project to test hypotheses quantitatively.
- (4) *Explore the underlying psychological mechanisms* and *perceived benefits* qualitatively with interview data to find explanations for observed effects.
- (5) *Derive propositions* on the impact of social interactivity on engagement formation and *provide an extended model* of the engagement process and recommendations for crowdsourcer on when and how to foster social interaction.

6.2 Recap: Engagement Formation and Behavior

The previous studies introduced in this thesis, focused more on assessing the psychological dimension of the engagement process, which was partly due to the type of data collected (i.e., of mostly qualitative nature) and the more explorative character of research methods picked to learn more about an entirely new research field. In this study, the focus is on both, the behavioral and psychological dimension of engagement to gain a more holistic picture of the impact of social interactivity on the engagement formation process. A short summary of the most important insights for both dimensions is summarized here (for more details, see Chapter 3):

The *psychological dimension* (i.e., the disposition to engage) can be understood as a psychological state that occurs by virtue of interactive experiences with a focal object. Such interactive experiences can cause subjective, internal, and mostly temporary responses, which were identified as satisfaction (Bowden, 2009; Briggs et al., 2008; Hollebeek, 2011; Sashi, 2012). Those types of satisfaction responses can be understood as backward looking, cognitive-affective evaluations of experiences (Mano & Oliver, 1993; Verhoef, 2003). Over time, those experience evaluations aggregate and intensify into a more persistent and pervasive, affective-cognitive state of mind, that is not limited to a single moment of interaction anymore (Hollebeek, 2011; Schaufeli & Bakker, 2004; Wefald & Downey, 2009). This rather forward-looking state is often translated as a commitment state, by which a crowdsourcee has the desire to maintain a relationship in future (Bowden, 2009; Brodie et al., 2011; Macey & Schneider, 2008; Sashi, 2012), either due to more rational (i.e., calculative commitment) or emotional reasons (i.e., affective commitment) (Gustafsson et al., 2005; Mollen & Wilson, 2010).

The *behavioral dimension* (i.e., the activity of engaging), goes along with the psychological dimension and can be understood as the behavioral manifestation of the level of engagement that a crowdsourcee develops during and after an interaction (Brodie et al., 2011; Kumar et

al., 2010; Van Doorn et al., 2010). It is the volitional investment of resources, which can be of tangible (e.g., equipment) and intangible (e.g., knowledge) nature (Hollebeek, Srivastava, & Chen, 2016). Van Doorn et al. (2010) propose different dimensions of engagement behavior, by which the level or intensity can be evaluated e.g., valence (i.e., positive or negative behavior), form (i.e., type of behavior), scope (i.e., temporal and geographic), and impact (i.e., immediacy, intensity, breadth, longevity). Nguyen et al. (2015) suggest that in a crowdsourcing context the magnitude, diversity, and temporal intensity (i.e., the sustained nature) of measurable effort devoted to a requested task, signals the level of engagement among participants. The magnitude indicator can be understood as the total number of activities that someone does as well as the individual effort that someone puts into an activity, like for example the contribution length in terms of its number of words or characters used.

Consequently, independent of a crowdsourcee's original intention to participate in a crowdsourcing initiative, this thesis argued that experiences made throughout the crowdsourcing journey foster higher or lower levels of engagement. Henceforth, *crowdsourcing engagement* was conceptualized as a process that ideally leads to short and long-term activities due to satisfying experiences that aggregate into a commitment state over repeated interactions. It is not defined as an end-state by itself but rather a psychological state of different intensity levels that changes over time and that can be observed and measured based on the activities that participating crowdsourcees devote to the platform. A high level of engagement is assumed, when e.g., more, diverse, short and long-term activities can be observed, whereas all kind of possible platform activities are accounted for.

Depending on the product or service development phase that a crowdsourcing project is designed for to support, activities that can be observed on the crowdsourcing platform can range from more pro-active and impactful efforts that help solving a problem (e.g., providing ideas, feedback or detecting potential bugs), to less impactful efforts that still may have an indirect value like helping to evaluate the contributions from other crowdsourcees (e.g., voting or liking ideas of others) or providing context for others (e.g., making a profile update that says something about ones competences and skills). Thus, *crowdsourcing engagement* is not just about a single activity's value or impact but more about a crowdsourcee's general level of activity over time and thus serves as a more holistic indicator of crowdsourcing success than e.g., only accounting for the numbers of ideas submitted.

In order to foster satisfaction responses in the short-term and commitment states in the long-term, accompanied by desired short-term and long-term engagement behaviors, specific experiences are supposed to dominantly impact the *crowdsourcing engagement process*. Prahalad and Ramaswamy (2004) believe that the opportunities for value creation are enhanced significantly for firms that embrace the concepts of personalized co-creation experience as the source of unique value. They suggest that personalizing the co-creation

experience means fostering individualized moments of high-quality interactions. Even in new co-creation spaces, such as crowdsourcing projects, initiators have at least partial control over the experience environment and the crowds they build to facilitate co-creation activities. According to Prahalad and Ramaswamy (2003) it is the task of the firm or initiator of those projects to create a robust and engaging experience environment, one in which infrastructures and capabilities are centered on co-creation through high-quality interactions and personalized co-creation experiences.

As value shifts to experiences, crowdsourcing initiatives must be seen as a forum for conversation and interactions and not just a passive collection of information. Concluding from that, the general assumption is that perceived interactivity fosters *crowdsourcing engagement* (Mollen & Wilson, 2010). In line with that, a closer assessment of the service and computer-mediated communication literature indicates that *social interactivity* may play an extraordinary role for platform engagement formation and behavior (Rafaeli & Sudweeks, 1998).

6.3 The Role of Social Interactivity for Engagement Formation

In virtual or platform-based environments, the general construct of interactivity is defined as the extent to which one can participate and modify content, in real time and by their own control (Steuer, 1992). Next to the ability to manipulate the environment, some authors assert the primacy of a two-way communication (Wu & Wu, 2006) and the degree to which a user perceives an interaction as responsive to their actions (Mollen & Wilson, 2010). Therefore, the literature differentiates between two types of platform-interactivity.

Mechanical interactivity refers to the interaction between user and technology, which relates to the active control of provided information on the platform (e.g., through navigation or content provision); whereas *social interactivity* refers to the reciprocal communication between subjects via a specific platform (Jiang et al., 2010). Although both types of interactivity may enhance platform engagement as they induce cognitive and emotional effects that can result in satisfactory experiences (Jiang et al., 2010; Takatalo, Nyman, & Laaksonen, 2008), *mechanical interactivity* relates to a more standardized experience and is usually perceived before social interactivity can occur (Berry, Wall, & Carbone, 2006). Hence, it is assumed that it rather forms or confirms expectations. In contrast, *social interactivity* can lead to a more personalized experience by which a higher level of cognitive and emotional arousal can be achieved that leads to even stronger satisfaction responses. It offers the chance to cultivate emotional connectivity among engagement subjects and exceeding expectations, which strengthens commitment and subsequent response behavior (Berry, Parasuraman, & Zeithaml, 1994).

Similarly, Prahalad and Ramaswamy (2004) argue that dialog implies interactivity, deep engagement, and the ability and willingness to act on both sides. It was also found that

excellent mechanic clues cannot overcome poor humanic clues due to its dominant effect, whereas the opposite was observed (Berry & Lampo, 2004; Wall & Berry, 2007).

The literature offers several reasons of why and how *social interactivity* may be positively perceived, depending on an individual's personality, motivation and values as well as the context in which social interactivity takes place. The *Uses and Gratifications Framework (UGF)*, used to identify the benefits of media and its impact on behavior and continuing use (Blumler & Katz, 1974; Herzog, 1942) is applied to organize knowledge on the potential of social interactivity impacting the engagement formation process. It suggests four categories of benefits that either relate to the *use and gratification of content* (e.g., messages carried by a medium) or the *use and gratification of processes* (e.g., use of the medium itself): 1) *social integrative*, 2) *personal integrative*, 3) *cognitive*, and 4) *hedonic benefits*.

- First, *social integrative benefits* describe the social ties that can be built with other individuals throughout an interaction. This is related to the concept of social presence, defined as the degree of awareness of another human being in an IT-mediated interaction and the appreciation of that interpersonal relationship (Walther, 1992). The fact that humans are social beings, evolutionarily biased toward a social orientation, may explain the tendency to respond more emotionally towards social presence, without extensive thought or deliberation (Moon, 2000). Nambisan and Nambisan (2008) emphasize that social interactions among peers in virtual environments foster group-identification, enhancing affective commitment and loyalty behavior (Kohler et al., 2011; Schulten & Schaefer, 2015). In service research, social benefits relate to the concept of rapport, defined as the personal, enjoyable and harmonious connection that is formed within customer-to-provider interactions. It reflects the interactive nature of co-creation processes and was also found to have a strong influence on service evaluations (Gremler & Gwinner, 2000) and affective commitment (Brodie et al. 2011).
- Second, *personal integrative benefits* relate to the strengthening of recognition or reputation of an individual by others on the platform. They are rooted within the interaction of the own demonstration of capabilities and knowledge to others as well as its recognition and appreciation through reactive behavior (Soliman & Tuunainen, 2015). Lerner and Tirole (2002) explain this effect in a community context with the signaling theory, stating that recognition of others signals competence and thus motivates to continued participation. It was found that recognition in form of feedback in a virtual environment led to increased activity due to a higher perceived level of competence (Martinez, 2015) and pride (Boons et al., 2015).
- Third, *cognitive benefits* relate to the information and knowledge gained throughout the interaction with others. Exposure to informational cues is known for increasing cognitive involvement (i.e., a perceived relevance of something for rational reasons), due to the active process of learning and understanding when dealing with new information, received by others (Jiang et al., 2010). This in turn was observed to

have positive behavioral effects, like purchasing responses in a consumption context (Eroglu, Machleit, & Davis, 2003).

- Lastly, *hedonic benefits* relate to the stimulation and entertainment gained from the content derived through the social interaction. Perceived hedonic benefits increase affective involvement (i.e., a perceived relevance of something for emotional reasons), due to aroused pleasure, joy or surprise. From human emotion studies it is known that emotional experiences dominantly impact decisions-making processes, for which reason hedonic stimuli are recommended to be used strategically to foster engagement (Zaltman, 2003).

6.4 Benefits of Social Interactivity in the Context of Crowdsourcing

Consequently, *social interactivity* with the prospective of fostering individualized moments of high-quality interactions and its diverse benefit potentials, is assumed to be a major driver of engagement formation among crowdsourcees.

In the crowdsourcing context, typically two forms of platform-mediated social interaction can occur: a) *crowd-to-crowd (C2C)* and b) *initiator-to-crowd (I2C) interaction*. While in collaborative settings *C2C-interaction* is always the case, in non-collaborative settings it still may apply, if e.g. a general discussion board, a comment function, or a messaging tool exists by which crowdsourcees have the possibility to publicly or privately interact with others. Similarly, diverse possibilities for *I2C-interactions* exist, like chat or commenting functions.

In the following section, examples for perceived benefits of social interactivity according to the UGF in the context of crowdsourcing are provided:

- Perceived *social integrative benefits* may either relate to the effect of group-identification, if the stimulus comes from other members of the crowd (C2C); or rapport, if the initiating firm is the source of interaction due to its official role as an organizer and service-provider (I2C). The initiator is likely to be friendlier and more supportive to serve its crowd, which may foster personal connection. Whereas interaction with other crowdsourcees, perceived as equal peers, may rather foster group-belonging, independent of the tonality.
- Furthermore, *personal integrative benefits* can be related to interaction with the initiator (i.e., firm-recognition) or other crowdsourcees (i.e., peer-recognition). Nevertheless, due to the special power of the initiator regarding the handling of contributions, firm-recognition may have an even stronger effect on the commitment state.
- *Cognitive benefits* may come from information received by other crowdsourcees or the initiator. Depending on the content, this relates to a passive state of immersion and absorption (Hollebeek, 2011; Hollebeek et al., 2014) or a more active state of

cognitive processing, implying e.g., learning, understanding, and reasoning (Mollen & Wilson, 2010).

- Lastly, *hedonic benefits* may come e.g., from humorous or pleasurable conversations with other crowdsourcees or with the initiator.

Related to the perceived benefits and according to the concept and process of *crowdsourcing engagement*, *social interaction* is supposed to stimulate *satisfaction responses* in the short-term and *commitment states* in the long-term, accompanied by short-term and long-term *engagement behaviors*, which are explored in more detail in this study. Observable engagement activities as suggested by Nguyen et al. (2015), like the number of activities, the effort one puts into an activity (i.e., the length of a text-response), the diversity across activities (i.e., the different types of activities) and temporal intensity (i.e., short and long-term activities) devoted to a platform, serve as measurable engagement-indicators.

6.5 Mixed Methods Research Design

Based on the insights derived from the literature review and the application of the UGF to the case of crowdsourcing, the general proposition is that social interactivity fosters platform engagement due to its diverse benefit potentials.

Initial research on exploring the effect of social interactivity in virtual consumer environments and crowdsourcing contexts dominantly relied on self-reported data, gained through (semi-) structured surveys, interviews and mental experiments. Only a minor part relied on a quantitative assessment of behavioral data and no mixed-methods studies were found.

Survey-data provided rather divergent insights on psychological effects and behavioral intentions. Some results illustrated that platform interaction affected emotions but not behaviors (Boons et al., 2015; Martinez, 2015). In this context, I2C-interaction was found to be explicitly desired (Deng, Joshi, & Galliers, 2016; Jeppesen & Frederiksen, 2006; Leimeister, Huber, Bretschneider, & Krcmar, 2009; Schäfer, Antons, Lüttgens, Piller, & Salge, 2017), while other studies pointed out that especially C2C-interaction was positively perceived (Brawley & Pury, 2016; Kohler et al., 2011; Literat, 2017; Schulten & Schaefer, 2015).

Those few studies, dealing with actual behavioral platform-data, either serve contradicting or limited results. Assessing data from Dell's Ideastorm platform, one study revealed that C2C-interaction positively impacts the number of ideas and I2C-interaction the idea-quality (Chen et al., 2012), while another study found that only repeated C2C-interaction impacted idea generation and I2C-interaction was positively related to idea submission (Chan et al., 2015). The focus of those studies lied on the innovation capabilities of contributors only and not the general activity level as a sign of engagement. The role of time as an important

dimension was neglected, but instead a cumulated amount of all activities at the end of a project used for assessments.

Besides the fact that there are methodological differences across studies, those findings also reveal that there are still relevant unknowns regarding the relationship between social interactivity and crowdsourcees' engagement. In order to fill those knowledge gaps, a study that interlinks quantitative and qualitative research for gaining deep insights into the behavioral (i.e., what) and psychological (i.e., how) effects is suggested.

Thus, a *mixed-methods approach* is used, with the goal of extending the breadth and range of inquiry by using quantitative and qualitative methods for different inquiry components as well as elaborating and enhancing the results of one study with the insights of the other (Greene, Caracelli, & Graham, 1989). Figure 26 illustrates the overall research model, predicting the effect of social interactivity, measured through I2C and C2C-interactions, on engagement state formation and related engagement behaviors and indicates the two different types of studies to measure effects. Compared to models introduced in prior chapters (e.g., Figure 4, Figure 16, Figure 21), here in addition to the concept of satisfaction response and commitment perceived benefits were included to show the entire chain of effects that is explored with both studies.

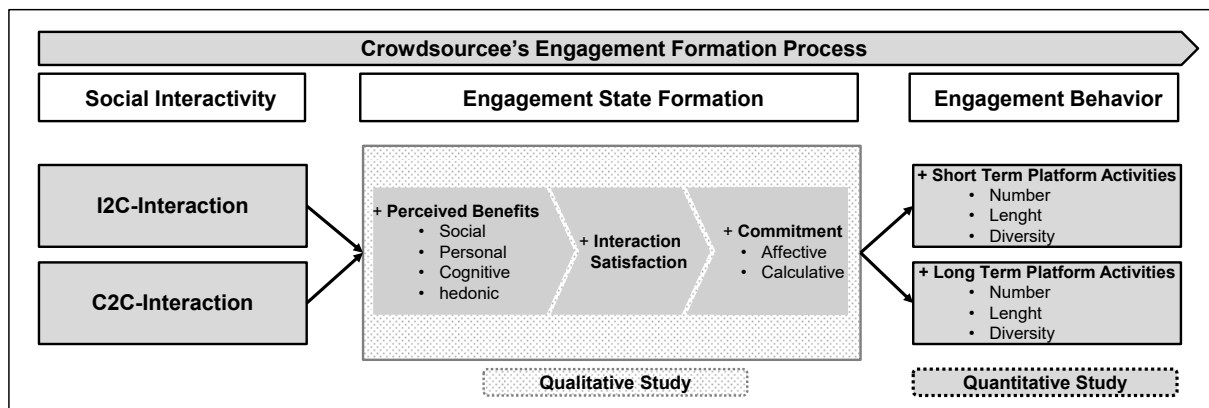


Figure 26. Overall Research Model for the Mixed Method's Study

Source: Own Illustration

The core of this paper focuses on a *quantitative approach*, based on log-data analysis from 11,408 crowdsourcees that participated in MobilityCorp's (Case C) crowdsourcing project. MobilityCorp's case was chosen because it illustrates a typical and successful crowdsourcing case with the largest sample size out of all consortium projects (necessary to derive statistical proven observations), which offered crowdsourcees and crowdsourcers diverse options to interact with each other (e.g., via private messenger, publicly on the platform by commenting on other contributions, and by up-voting other contributions). While existing research relied on a single engagement indicator (e.g., number of ideas contributed), here a multidimensional definition of engagement, measured in form of the total number, length, and diversity of activities that one devotes to the platform, is applied to better capture the more holistic idea of platform success (Bayus, 2013; Blohm et al.,

2013). Moreover, in order to take the temporal dimension into account, this study differentiates between short and long-term effects to provide insights regarding the intensity of engagement that develops after social interactivity is perceived.

In addition to the quantitative study, capturing the behavioral short and long-term effects of social interactivity on engagement, a *qualitative exploration* of perceived benefits and related satisfaction and commitment states was conducted by interviewing selected participants. Findings were complementarily used to discuss observed effects from the quantitative study. Each study is discussed in more detail in the upcoming sections.

6.6 Quantitative Study: Assessment of Engagement Behavior

6.6.1 Methodology and Hypotheses

For the quantitative study, the general proposition that social interactivity in form of I2C and C2C-interaction, fosters platform engagement is translated into the following *six testable hypotheses*, based on the three behavioral engagement indicators derived from the work of Nguyen et al. (2015) and Van Doorn et al. (2010): number, length and diversity of crowdsourcee's platform activities and by accounting for short and long-term behaviors:

- H1 a/b: I2C/C2C-interaction has a positive *short-term impact* on the *number of activities*.
- H2 a/b: I2C/C2C-interaction has a positive *long-term impact* on the *number of activities*.
- H3 a/b: I2C/C2C-interaction has a positive *short-term impact* on the *activity length*.
- H4 a/b: I2C/C2C-interaction has a positive *long-term impact* on the *activity length*.
- H5 a/b: I2C/C2C-interaction has a positive *short-term impact* on the *diversity of activities*.
- H6 a/b: I2C/C2C-interaction has a positive *long-term impact* on the *diversity of activities*.

Figure 27 shows the specific research model that was used for the quantitative study. In order to assess the direct effects, several regression models were calculated. The unit of analysis in this study is not a crowdsourcee per se but a *sequence or event*, which consists of a social interaction (independent variable) that happened at time t and subsequent short-term (at time $t+1$) and long-term platform activities (dependent variable) that were observed at $t+1$ (lagged). A sequence ends, when another social interaction was experienced, which then indicates the start of a new sequence of the same consumer (see bottom of Figure 27 for an illustration). This approach increased the likelihood that observed activities are causally related to prior interaction-effects. Hence, all the log data collected from the 11,408 participants, needed to be transformed and summarized into those individual sequences (Greene, 2012). Each data set of a crowdsourcee varied in the number and length of sequences. However, every single crowdsourcee started with a “zero-sequence” as some form of activity needed to be devoted to the platform in order to raise attention, before social interaction could have taken place. For those crowdsourcee, who only registered, but never

participated in any activity and hence never experienced any form of social interaction in response (i.e., the “zero-group”), only one sequence could be recorded.

To make data on sequences comparable and to be able to differentiate between *short* and *long-term efforts*, each sequence was divided into two parts: the first part, consisted of all activities observed within one week (t+1) after a social interaction was experienced and the second part (t+1(lagged)) comprised all activities that were made after one week. Chan et al. (2015) were the first, who suggested to use a weekly perspective for assessing platform behavior.

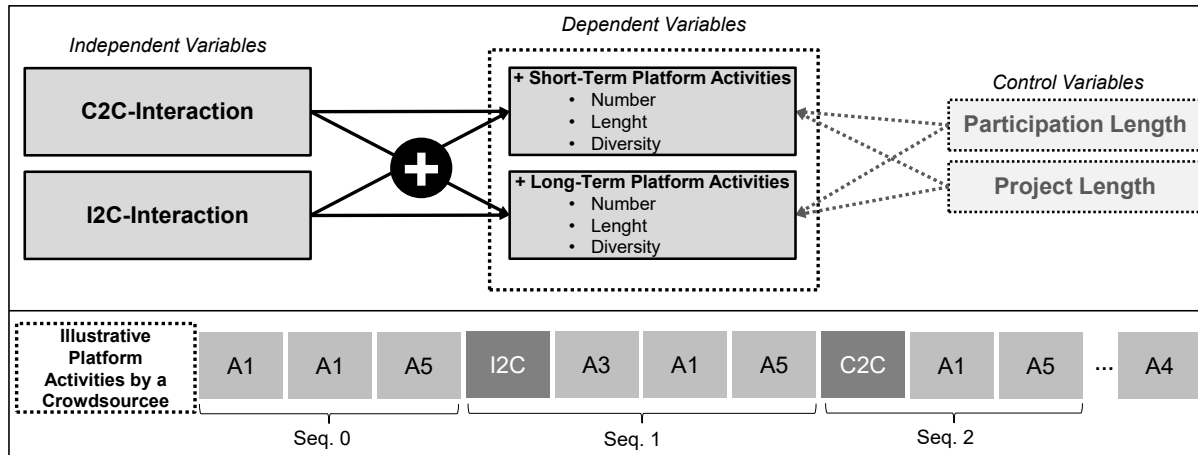


Figure 27. Quantitative Research Model

Source: Own Illustration

I2C and C2C-interaction, as measures for social interaction, were treated as dummy variables with the value 1 when an interaction took place or 0 otherwise. There were two ways for social interaction to take place on the platform: a) private message sent to a crowdsourcer; b) public response-post to a crowdsourcer’s platform activities, either by the initiator (I2C) or other crowd members (C2C).

Furthermore, different dependent variables, measured at different points in time to test each hypotheses, were used for different regression models. The first dependent variable, *number of activities*, was measured as the sum of all potential crowdsourcer’s activities that could have been devoted to the platform: voting on a contribution of another crowdsourcer (A1); updating one’s own profile (A2); sending a private message to another crowdsourcer or a moderator (A3); contribution-creation (i.e., the creation of an idea or filing a bug) (A4); or feedback-creation (i.e., providing feedback to another idea/bug) (A5). Those activities can be also divided into *low-effort type* of activities (A1 and A2) that require no text contribution and *high-effort type* of activities that do require a text contribution (A3, A4 and A5). For exploration reasons, cumulated (i.e., all type of effort activities) and separate models (i.e., low vs. high-effort activities) will be tested.

The second dependent variable, *activity length*, as an indicator of how much effort a crowdsourcer has put into a *high-effort type* of contribution that included a text response,

was measured by the number of characters that were used. The third dependent variable, *activity diversity*, was measured by the number of different types of activities (A1-A5) that a crowdsourcee has devoted to the platform after a social interaction took place.

Lastly, two control variables were defined, that could have affected platform engagement: *participation-length* of a c crowdsourcee (i.e., the time since the registration date until a social interaction is experienced) and official *project-length* (i.e., the time since the platform was launched until a social interaction is experienced). Hence, in total six different estimation models were planned, one for each dependent variable at time $t+1$ and $t+1$ (lagged), including the two independent- and control variables. As dependent variables consisted only of count data, a *Poisson regression model* (i.e., only recognizing the non-negative integers) and a *negative binominal model* was tested. Additionally, a *coefficient-test* was run to filter out potential crowdsourcee-related biases across sequences of the same crowdsourcee (Greene, 2012).

6.6.2 Data Assessment

At the time of the data-extraction from the crowdsourcing platform (August 2017), 11,408 participants had registered (since November 2016), showing an average participation length of 36 days (max. 269). As illustrated in Figure 28, circa 15 percent of all participating crowdsourcees devoted high-effort activities to the platform i.e., they submitted at least one idea or bug (A4) or gave feedback on another post (A5). Around 12 percent showed mediocre engagement as they devoted only low-effort type of activities like profile updates (A1) and voting (A2). 73 percent stayed completely passive over the platform-lifecycle.

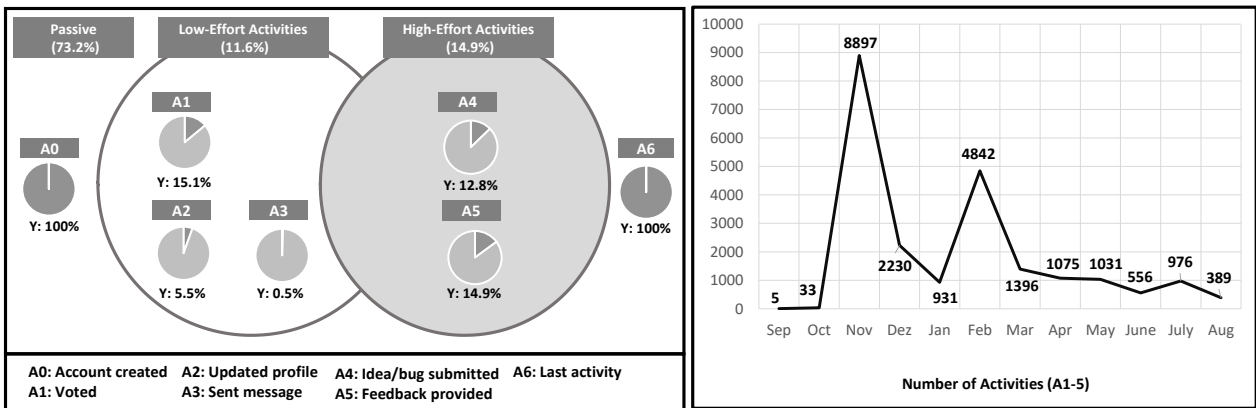


Figure 28. Preliminary Platform Data-Assessment of Crowdsourcees' Engagement Behaviors

Source: Own Illustration

Concerning the 90:9:1-rule (McConnell & Huba, 2007), the given case seems to illustrate a success-case, as behavioral engagement within the participation process was relatively high. Moreover, a declining behavioral engagement-curve can be observed, as it is common to many projects of that kind (Bayus, 2013). Two participation peaks can be observed, which

relate to two public press announcements of the initiative in free newspapers that were available at train- and tram stations.

Nevertheless, the descriptive statistics, provided in Table 4, show that in total 5,022 sequences could be identified, of which 1,286 refer to sequences starting with an I2C-interaction and 908 starting with a C2C-interaction. The rest refers to the zero-group, showing activities, unrelated to any social interaction.

I2C-Group: 1286 Sequences	ASum	Alow	Ahigh	ADiversity	ALength	Asuml	Alow	Ahigh	ADiversityl	Part.length
Min	0	0	0	0	0	0	0	0	0	11
Mean	0,59	0,3	0,3	0,32	145,3	0,46	0,29	0,16	0,2	51872
3rd Qu	0	0	0	0	48,75	0	0	0	0	62166
Max	32	23	15	4	5159	33	24	12	4	388503
C2C-Group: 908 Sequences										
Min	0	0	0	0	0	0	0	0	0	5
Mean	0,63	0,31	0,32	0,3	183,8	0,51	0,27	0,24	0,14	69428
3rd Qu	0	0	0	0	0	0	0	0	0	115423
Max	24	21	17	5	14825	45	29	42	5	390413
Zero-Group: 2828 Sequences										
Min	1	0	0	1	0	0	0	0	0	0
Mean	2,73	1,96	0,77	1,36	214,5	0,39	0,3	0,09	0,15	16348
3rd Qu	3	2	1	2	269,2	0	0	0	0	1090
Max	56	51	11	5	7128	87	86	10	4	390690

Table 4. Descriptive Statistics

On average, in the short-term, 0.59 activities (max. 32, diversity of 0.3) followed an *I2C-interaction*, of which around half referred to high-effort type of activities like idea and bug posting or feedback provisions in response to other posts. The other half related to low-effort type of activities. For text-related activities, a length of 145.3 characters (max. 5159) was observed, illustrating the effort that one devoted to a high-effort type of activity. In the long-term, on average 0.46 activities (max. 33, diversity 0.2) followed an I2C-interaction.

In comparison, in the short-term, on average 0.63 activities (max. 24, diversity of 0.3) followed a *C2C-interaction* with the same distribution of high and low-effort type of activities. For text-related activities, a length of 183.8 characters (max. 14825). In the long-term, on average 0.51 activities (max. 45, diversity 0.2) followed a C2C-interaction. Based on that, it can be concluded that descriptive statistics seem relatively similar for both type of social interaction.

6.6.3 Hypotheses Test

Correlations and main regression-results are reported in Table 5 and Table 6, respectively. After an analysis of the data-distribution based on histograms and rootograms, a *Poisson regression model* was used to analyze the effects of social interaction on count data (i.e., activity number, length, diversity). The Poisson log-likelihood presents coefficients that show the unit-increase related to a crowdsourcee's activity level, when a social interaction

occurred. To receive percentage ratios, coefficients needed to be exponentialized. To test the model's suitability an *over-dispersion test* was conducted, as suggested by Cameron and Trivedi (1990), which turned out to be positive.

Therefore, in a next step a *negative binominal model (Negbin2)*, similar to the Poisson regression model but including a random component that reflects the uncertainty about the true rates at which events occur for individual cases (Greene, 2012), was chosen. Furthermore, to account for crowdsourcee and platform-biases related to the project-lifecycle and individuals' prior activities, two controls (i.e., participation and project length) were added.

As can be seen by the *Akaike Information Criterion (AIC)*, a measure of the goodness of fit (Greene, 2012), the model with controls has a lower AIC-score and hence is supposed to perform better. However, as controls seemed to have only minimal effects, they are not further assessed. Additionally to that, a *coefficient test* was applied to filter out user-related biases across sequences, which adjusted the significance of coefficients slightly.

Overall, most results stayed relatively stable throughout all model adaptations. Furthermore, correlations (Table 5) and scatter plots of the residuals present no specific patterns or overly correlated variables. Hence, a closer look at the results of the negative binominal model, including controls and adjusted by the coefficient test, is taken (Table 6).

	I2C-interact	C2C-interact	Asum	Alow	Ahigh	ADiv	ALen	Asuml	Alowl	Ahighl	ADivl	ALenl	Part.len	Proj.len
I2C-interact	1	-0,09	-0,01	-0,03	0,04	-0,01	0,05	0,06	0,02	0,05	0,06	0,05	0,26	0,17
C2C-interact	-0,09	1	0	-0,02	0,04	-0,01	0,05	0,09	0,08	0,03	0,06	0,08	0,31	0,14
Asum	-0,01	0	1	0,95	0,61	0,7	0,47	0,11	0,11	0,04	0,08	0,11	0,04	0,05
Alow	-0,03	-0,02	0,95	1	0,34	0,56	0,26	0,15	0,15	0,05	0,1	0,15	0,01	0,02
Ahigh	0,04	0,04	0,61	0,34	1	0,69	0,78	0,07	0,05	0,22	0,21	0,05	0,09	0,12
ADiv	-0,01	-0,01	0,7	0,56	0,69	1	0,5	0,09	0,08	0,2	0,2	0,08	0,08	0,16
ALen	0,05	0,05	0,47	0,26	0,78	0,5	1	0,1	0,08	0,1	0,12	0,08	0,08	0,08
Asuml	0,06	0,06	0,2	0,21	0,08	0,12	0,06	1	0,94	0,29	0,64	0,92	0,55	0,09
Alowl	0,05	0,03	0,2	0,22	0,04	0,1	0,03	0,94	1	0,23	0,57	0,88	0,39	0,07
Ahighl	0,06	0,09	0,09	0,07	0,11	0,1	0,08	0,29	0,23	1	0,92	0,28	0,54	0,05
ADivl	0,14	0,07	0,19	0,19	0,09	0,18	0,06	0,64	0,57	0,92	1	0,6	0,66	0,07
ALenl	0,05	0,08	0,08	0,05	0,11	0,08	0,09	0,92	0,88	0,28	0,6	1	0,47	0,08
Part.len	0,26	0,31	0,04	0,01	0,09	0,08	0,08	0,55	0,39	0,54	0,66	0,47	1	0,11
Proj.len	0,17	0,14	0,05	0,02	0,12	0,16	0,09	0,09	0,07	0,05	0,07	0,08	0,11	1

Table 5. Correlation Matrix

First of all, by looking at *Model 1 (M1)*, accounting for all types of short-term activities in one sequence (Asum), it can be observed that at a significance level of 5 percent, experienced I2C-interaction negatively affected the total number of short-term activities by a unit-decrease of 0.23 (p<1 percent) for the negative binominal model with controls and for the model, including the coefficient test. This translates into a 26 percent (p<5 percent) decrease of total activities. In comparison, experienced C2C-interaction shows no significant short-term effect on the total number of crowdsourcees' activities at a significance level of 5 percent. However, looking at the long-term effects by using the

lagged values (*M1lag*), an equally significant and positive effect for both types of social interaction (1.36, $p < 0.1$ percent) is observed for all model variations. Hence, while *H1 a/b*, predicting that I2C/C2C-interaction has a positive short-term impact on the number of activities cannot be confirmed; *H2 a/b*, predicting that I2C/C2C-interaction has a positive long-term impact on the number of activities can be confirmed, based on this data set.

Second, *Model 2 (M2)* allows a closer look at the activity length (*Alength*) of a text-contribution, measured in terms of the characters used. All model versions show a consistently significant ($p < 1$ percent) and strongly positive effect of I2C (0.61) and C2C-interaction (0.66) on short-term activity-length. Similarly, the lagged model (*M2lag*) also shows significant and positive long-term effects for I2C- (1.94, $p < 0.1$ percent) and C2C-interaction (2.23, $p < 0.1$ percent) under the negative binominal model with controls and applied coefficient test. Thus, *H3 a/b* and *H4 a/b*, predicting that I2C/C2C-interaction has a positive short-term and long-term impact on the activity length, can be confirmed, based on this data set.

Third, *Model 3 (M3)* presents the impact of social interaction on the diversity of activities that were devoted to the platform (*Adiversity*). Contrary to hypotheses 5 a/b, predicting a short-term increase in diversity due to enhanced engagement, the results show a negative effect of I2C (-0.27, $p < 0.1$ percent) and C2C-interaction (-0.34, $p < 0.1$ percent) for the negative binominal model with controls. Nevertheless, when applying the coefficient test, no significant effects appear anymore. However, long-term effects are strongly positive for I2C (1.53, $p < 0.1$ percent) and C2C-interaction (1.13, $p < 0.1$ percent) across all model variations. Thus, hypothesis 6a/b is supported.

In addition, a fourth and fifth model was tested in order to find an explanation for the negative and insignificant short-term observations related to the overall number of activities and diversity. Therefore, the variable, testing the total number of activities (*Asum*) was divided into the two types of effort variables, low (*A1-2*) and high (*A3-6*), and separately tested. *Model 4a (M4a)* measured the short-term impact of social interaction exclusively on all high-effort activities (*Ahigh*), which are related to actual content-creation that takes more cognitive effort and creates more value for the initiator than the other activities. All model variations showed a significant positive effect for I2C (0.25, $p < 5$ percent) and C2C-interaction (0.36, $p < 1$ percent), translating into a short-term increase of high-effort activities by 28.5 percent and 43.3 percent, respectively. This observation is consistent with the lagged models (*M4alag*), showing a lasting and even stronger long-term increase for high-effort activities (*Ahighl*), after social interaction is experienced (I2C=1.81, C2C=2.04, $p < 0.1$ percent). In comparison, *Model 4b (M4b)*, which illustrates the short-term impact of social interaction exclusively on all low-effort activities (*Alow*), showed a significant negative effect for I2C (-0.55, $p < 0.1$ percent) and C2C-interaction (-0.48, $p < 1$ percent), which turns into a positive long-term effect (I2C=1.18, C2C=1.05, $p < 0.1$ percent), when looking at the lagged models (*M4blag*).

That offers a potential explanation for why the total activity level and diversity was either not at all or negatively affected by social interaction. Instead of an overall increase, social interactivity seemed to cause an *effort-shift* from low to high-effort activities and an increase in characters spent (and hence time) on individual activities in the short-term. In the long-term, overall engagement in terms of the numbers, length and diversity of activities was positively affected by social interaction.

	Dependent Variable →	M1 (Asum)	M2 (Alength)	M3 (Adiversity)	M4a (Ahigh)	M4b (Alow)	M1lag (Asuml)	M2lag (Alengthl)	M3lag (Adiversityl)	M4alag (Ahighl)	M4blag (Alowl)
Basic model	Model Fitness (AIC)	26205	41130	20394	14619	19314	6800	8605,5	5432,2	3821,3	4998
	Intercept	-0,38***	3,87***	-1,07***	-1,65***	-0,71***	-2,34***	1,66***	-3,3	-3,83***	-2,59***
	I2C-Interact	-0,13	0,71***	-0,05	0,44***	-0,50***	1,56***	2,19***	1,69	2,03***	1,36***
	C2C-Interact	-0,07	0,77**	-0,13	0,52***	-0,45***	1,67***	2,71***	1,34	2,43***	1,27***
	Theta	0,16	0,02	0,78	0,27	0,09	0,02	0	0,1	0,04	0,01
Coef.test	Intercept	-0,38***	3,87***	-1,07***	-1,65	-0,71***	-2,34***	1,66***	-3,30***	-3,83***	-2,59***
	I2C-Interact	-0,13	0,71***	-0,05	0,44***	-0,50***	1,56***	2,19***	1,69***	2,03***	1,36***
	C2C-Interact	-0,07	0,77***	-0,13	0,52***	-0,45**	1,67***	2,71***	1,34***	2,43***	1,27***
Model with controls	Model Fitness (AIC)	26152	41088	20084	14429	19310	6784,7	8603,4	5418,6	3804,5	4990
	Intercept	-0,61***	3,25***	-1,52***	-2,14***	-0,80***	-2,12***	1,68***	-3,24***	-3,73***	-2,33***
	I2C-Interact	-0,23**	0,61**	-0,27***	0,25**	-0,55***	1,36***	1,94***	1,53***	1,81***	1,18***
	C2C-Interact	-0,13	0,66**	-0,34***	0,36***	-0,48***	1,36***	2,23	1,13***	2,04***	1,05***
	Participation lenght	0,00***	0,00*	0,00***	0,00***	0	0,01***	0,01*	0,01***	0,01***	0,01***
	Project lenght	0,00***	0,00*	0,00***	0,00***	0	0,00**	0	0	0	0,00*
	Theta	0,17	0,02	0,95	0,29	0,09	0,02	0	0,1	0,04	0,01
Coef.test	Intercept	-0,61***	3,25***	3,25	-2,14***	-0,80***	-2,12***	1,68***	-3,24***	-3,73***	-2,33***
	I2C-Interact	-0,23*	0,61***	0,61	0,25*	-0,55***	1,36***	1,94***	1,53***	1,81***	1,18***
	C2C-Interact	-0,13	0,66***	0,66	0,36**	-0,48**	1,36***	2,23***	1,13***	2,04***	1,05***
	Participation lenght	0,00*	0,00***	0	0,00***	0	0,01***	0,01***	0,01***	0,01***	0,01***
	Project lenght	0,00*	0,00***	0	0,00***	0	0,00*	0	0	0	0

Significance levels: *** p<0.001, ** p<0.01, * p<0.05

Table 6. Regression Output (Negative Binominal Model)

6.7 Qualitative Study: Assessment of Perceived Benefits and Final Engagement States

6.7.1 Methodology

For the qualitative follow-up assessment of the effect of social interactions on the psychological dimension of engagement, *semi-structured interviews* with 23 crowdsources, who participated in the initiative of circa 90 minutes were conducted. The

goal was to identify potential benefit perceptions and satisfaction responses related to social interactivity and detect signs for commitment formation as part of the engagement process.

In August 2017 a second open call on the platform and via email to all registered members was made, to screen and invite participants for another interview study (i.e., in addition to the first round mentioned in the multiple case study in Chapter 3). To increase the chance that crowdsourcers experienced any form of social interaction on the platform, only active contributors (i.e., non-zero groups), who were registered for at least three month, were recruited. A diverse mix of genders, ages and work backgrounds was selected.

A detailed overview of interviewed crowdsourcers is provided in Table 7. The sample size was defined, based on the concept of data saturation (Fusch & Ness, 2015). Meaning an initial sample of seven interviewees was selected in order to get insights on high level themes and patterns. Additional interviewees were invited until no new themes and patterns appeared and a sufficient level of confidence from a researcher-perspective was achieved.

Interviewed Crowdsourcers	Gender	Age	Occupation	Participation Length	I2C experienced	C2C experienced	Commitment (based on analysis)
C1	M	18-29	Student	3-4 Month	NO	NO	None
C2	M	30-39	IT-Consultant	>7 Month	YES	YES	AC & CC
C3	M	18-29	Sales specialist	>7 Month	YES	YES	CC
C4	F	18-29	Car Dealer	5-6 Month	NO	YES	CC
C5	M	>59	Retired	>7 Month	YES	YES	AC & CC
C6	F	40-49	Teacher	>7 Month	YES	YES	AC & CC
C7	F	18-29	Homemaker	3-4 Month	NO	NO	None
C8	M	30-39	Unemployed	5-6 Month	YES	YES	AC & CC
C9	M	30-39	Mech.Engineer	3-4 Month	YES	YES	CC
C10	M	30-39	Chef	3-4 Month	YES	NO	AC
C11	F	30-39	Secretary	5-6 Month	YES	YES	CC
C12	F	40-49	Call Cent Ag.	3-4 Month	NO	YES	CC
C13	M	18-29	Sales Trainee	5-6 Month	YES	YES	AC & CC
C14	F	18-29	Student	>7 Month	YES	YES	AC & CC
C15	M	50-59	Landscape.Arc.	5-6 Month	YES	YES	AC & CC
C16	M	40-49	Homemaker	5-6 Month	YES	YES	AC & CC
C17	M	30-39	UX Designer	3-4 Month	NO	YES	CC
C18	F	30-39	Project Mgmt.	5-6 Month	YES	NO	AC
C19	F	18-29	Bus. Student	5-6 Month	YES	NO	AC
C20	M	30-39	Software Eng.	>7 Month	YES	YES	AC & CC
C21	M	30-39	Pers. Trainer	3-4 Month	NO	NO	None
C22	M	40-49	Dental Assist.	3-4 Month	YES	YES	CC
C23	M	30-39	Sales person	3-4 Month	YES	YES	AC & CC

M= male
F= female

CC= showed signs for Calculative Commitment
AC= showed signs for Affective Commitment

Table 7. List of Interviewed Crowdsourcers

The applied interview method for reflecting on social experiences and exploring benefit perceptions that resulted in cognitive-affective evaluations and potential commitment states was the *laddering technique* (Reynolds & Gutman, 1988). Laddering refers to an in-depth, one-on-one bottom-up interviewing approach in which the interviewer asks a series of questions to abstract higher-order meanings that drive interviewees' perceptions (Olson &

Reynolds, 2001). It was developed in conjunction with the means-end model that draws on insights from motivation and cognitive psychology (Gutman, 1982). First, meaningful and memorable service attributes or activities are identified. In a second step, interviewees are asked why an attribute or activity is important to them to get insights on psychological consequences and underlying benefits and values (Reynolds & Gutman, 1988). While we used a more complex approach for the multiple case study to derive broad insights across many stimuli (i.e., throughout the *crowdsourcing journeys*), here more in depth insights related to an individual stimulus (i.e., social interaction in form of I2C or C2C-interaction) was in the focus of the study.

The analysis of the data involves summarizing the key elements by applying *standard-content analysis procedures* (e.g., Gläser & Laudel, 2010; Mayring, 2015), while bearing in mind the levels of abstraction. In the end, a graphical representation was used to show so called ladders, demonstrating the connections between an attribute (i.e., the activity) and lower and higher order constructs (Reynolds & Gutman, 1988). Two researchers independently coded the data and subsequently discussed and aligned findings. Results from the Interview Study.

In a first step, interviewed crowdsourcees were asked, if they experienced any type of interaction with the initiator and/or other crowdsourcees and to give some details on those experiences. Most interviewees (20 out of 23) right away remembered a moment of social interaction (e.g., C3: “Of course I remember! One of [MobilityCorp] moderators asked me to provide more details on my idea [...]”), while few (only three) stated that they did not experience any social interaction during their entire participation time (e.g., C7: “No, sadly not although I would have needed some help when I tried to edit a comment.”). In a second step, interviewed crowdsourcees were asked to elaborate on their *social interactions* and to provide details on what exactly they experienced and what this interaction meant to them. Figure 29 gives an overview of the end-result of the coding and synthesizing process of the 23 interviews, for which the *laddering approach* was applied. On the bottom of the graphic, the two types of social interactions are presented that crowdsourcees may have experienced throughout their value-proposition co-creation activities. For each type of interaction, different sub-activities were mentioned during the interviews, such as a tagged status of a contribution by an initiator (e.g., I2C-sub activity), received support or additional information by an initiator or another crowdsourcee (e.g., C2C-sub-activity) or a received comment or a vote on a provided idea or bug. Those are shown as a starting point of the laddering diagram. By using laddering questions, such as “*What meant this activity to you*” and continuously asking “*Why*” and surveying the future intentions of crowdsourcees, the interviewers uncovered the underlying consequences of an experienced interaction. All type of related intermediate *cognitive-affective states*, perceived *benefits* and signs of *commitment* that could have been identified are illustrated on top of the sub-activities and connectors are used to show relationships.

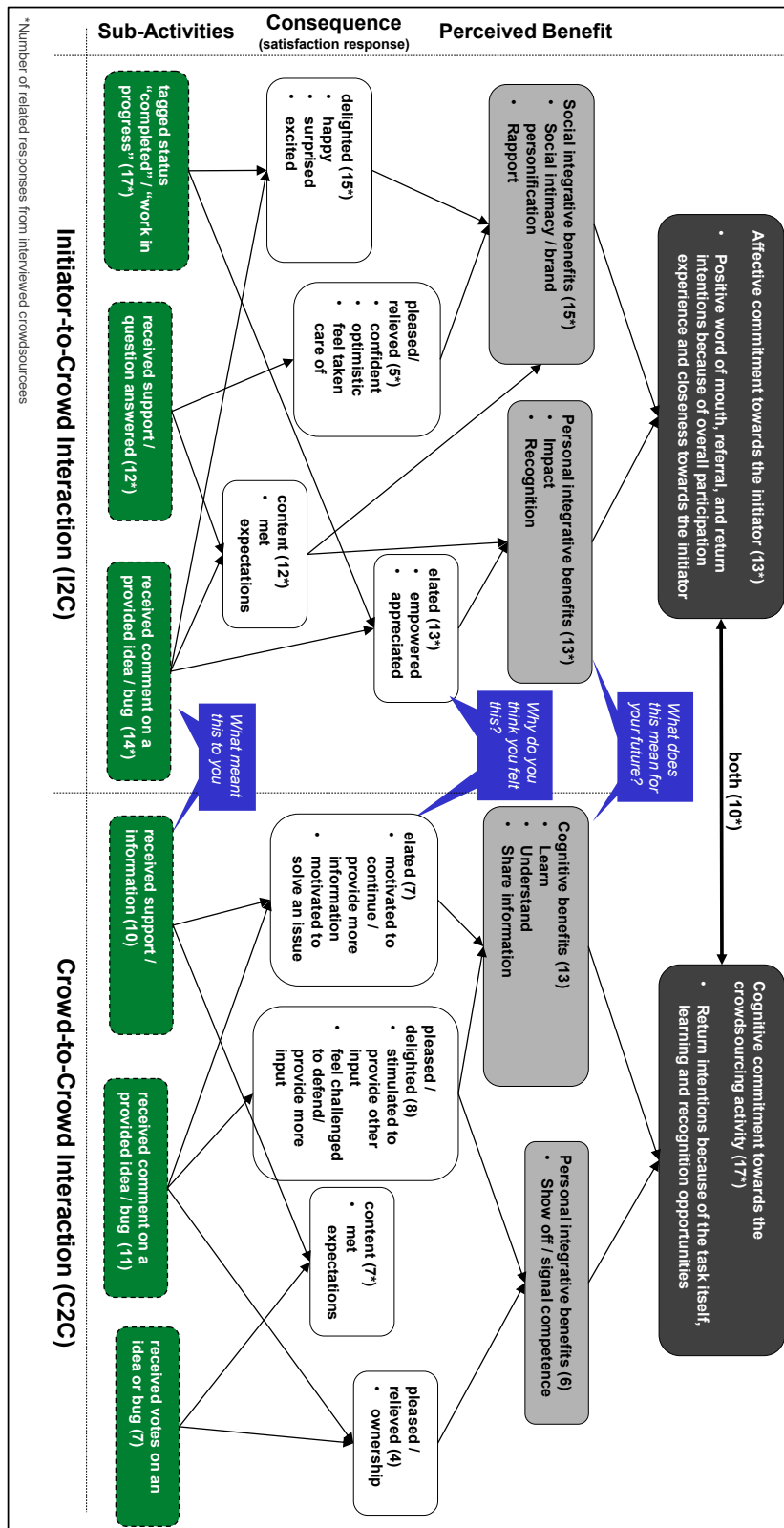


Figure 29. Overview of Coded and Synthesized Interview-Results

Source: Own Illustration

Experienced Initiator-to-Crowd Interaction

When reflecting on the meaning of a specific sub-activity, some interviewed crowdsourcers, who experienced *I2C-interaction* in form of a *tagged status* by the initiator (e.g., “completed” or “work in progress”) mentioned that they felt “happy”, “positively surprised”, and “excited”. Those satisfaction responses can be summarized as a form of *delight* (e.g., C5: “I was so surprised that the moderator responded to my input. I never expected that!”). In addition, many interviewees mentioned that they appreciated the tag by the initiator a lot and that they felt empowered by it, which can be summarized as an even higher emotional arousal state, like *elation* (e.g., C13: “Great to see that my work is seen and liked.”). Those, who experienced some form of *virtual support* by the initiator described feelings of *relief* (e.g., C2: “They immediately replied to my question. I feel, I can rely on their help, when needed.”) or simple *contentment* as a consequence of that (e.g., C15: “Felt good about. That is what I expected to happen.”). *Posted comments* by the initiator in response to crowdsourcers’ idea or bug contributions led to all three types of cognitive-affective states as *contentment*, *delight*, and *elation* across the crowd.

When interviewees were asked, why they think they sensed some form of arousal, explanations can be summarized as either a form of perceived *social integrative benefits*, related to *delight*, *pleasure* and *contentment* states (e.g., C5: “It’s nice to get to know some people behind the scenes. We are here to help [MobilityCorp].”); or *personal integrative benefits*, related to feelings of *elation* and *contentment* (e.g., C13: “Of course I want my work to have an impact. That’s why I’m doing this. It’s amazing to see how my ideas are considered!”).

When asked about future behaviors, most interviewees who mentioned one of the named benefits also indicated intentions to *return*, *positively talk* about the project and *refer* participation to friends and family due to their overall positive participation experience and relationship towards the initiator (e.g., C3: “I definitely would help again. It’s a great initiative. I also would ask my partner to join next time.”). Those can be interpreted as signs of *affective commitment*, especially towards the initiator and independent of the project itself. Around half of the interviewees developed some form of *affective commitment*, related to the perceived benefits from I2C-interaction.

Experienced Crowd-to-Crowd Interaction

In comparison, some interviewed crowdsourcers, who experienced *C2C-interaction* in form of a *received vote* for an idea or bug by other platform members, mentioned that they felt motivated and inspired, which can be translated into a state of *elation* (e.g., C9: “It seems my idea is not so bad. I will give my best and try even harder!”). Yet, some crowdsourcers mentioned that they actually expected some votes for their efforts and showed only signs of *contentment* (e.g., C12: “the bug must have been annoying to many. Many votes means, it hopefully gets fixed soon.”). *Posted comments* by other crowdsourcers in response to an idea or bug, aroused for many interviewees a feeling of

pleasure and *delight* and encouraged some to come up with more contributions and stronger arguments for existing ones. In this term, I2C seemed to have an activating and inspiring effect on crowdsourcers to work even harder (e.g., C23: “Thanks to that comment, I had something like a Eureka moment! I posted my new idea right away.”). Besides that, most who experienced some form of *virtual support* by other consumers, mentioned that it motivated them to continue contributing and solving an issue. Some of them reached a state of *elation* and increased *contentment* (e.g., C2: “Someone reached out to me via messenger to show me how to upload screenshots. Finally, I was able to provide even more details on my post.”).

Explanations on why interviewees thought they sensed some of those intermediate states, were summarized as either a form of perceived *cognitive benefits*, related to feelings of *pleasure*, *elation* or *delight* (e.g., C23: “It’s very fulfilling. I feel, I can learn something new and in turn share some of my knowledge with others. I wish I could say that about my day job”); or *personal integrative benefits*, grounded in the feeling of *pleasure* and *pride* for their efforts (e.g., C9: “It’s cool to show what I’m capable of.”).

When asked about future behaviors, most interviewees, who mentioned one of the named benefits, indicated *intentions to return* for the same or similar projects, depending on the task and the learning opportunities that can be anticipated (e.g., C2: “I would come back, if it’s an interesting task and I have the time for it”). Those intentions can be interpreted as signs of a more *rational commitment* directed towards the project and task itself, rather than the initiator. It seemed that most of the interviewed crowdsourcers developed some form of calculative commitment, related to perceived benefits from C2C-interaction.

Lastly, It needs to be mentioned that those few crowdsourcers, who stated that they did not experience any form of social interaction, mentioned a sense of *disappointment* related to either a missing learning opportunity, a feeling of belongingness or appreciation (e.g., C21: “When I voluntarily work for [MobilityCorp], I would expect some response from them. Why would I post something ever again?”; C7: “I hoped, I could have some fruitful discussions with others but nothing happened.”). It seemed like they did not develop any form of commitment during their project time.

6.8 Discussion

In this study, engagement was conceptualized as a process that ideally leads to short and long-term crowdsourcers activities, due to satisfying experiences that aggregate into a commitment state over repeated interactions. Four measurable engagement-indicators were identified, such as the number of overall activities one devotes to a platform as well as the activity length, diversity and temporal intensity (i.e., short and long-term activities) (Nguyen et al., 2015; Van Doorn et al., 2010). Independent of a crowdsourcer’s original intention to participate, it was argued that an initiative fosters higher or lower levels of engagement. In this context, social interactivity, with the prospective of fostering

individualized moments of high-quality interactions and its diverse benefit potentials (Prahalad & Ramaswamy, 2004), was proposed to be a major driver of *crowdsourcing engagement formation*.

As predicted, the *quantitative study* confirmed that social interactivity, in form of I2C and C2C-interaction, was positively related to overall more crowd engagement in the long-term. However, in the short-term it was observed that the number of total activities as well as the diversity across activities was either not affected at all or even negatively related to social interactivity. Taking a closer look at the different types of activities, by differentiating low-effort activities from high-effort activities, as suggested by Van Doorn et al. (2010), an effort-shift took place that was positively related to experienced social interactivity. That is, a significant reduction in low-effort activities and an increase in the number of high-effort activities as well as the effort one put into an activity itself (i.e. the activity length) was observed. Consequently, based on those observations, social interactivity is assumed to positively affect engagement formation. Nevertheless, while the overall direction of the effects (i.e., positive or negative) were observed to be the same for both types of interactions, small differences in the extent could be detected.

C2C-interaction was related to slightly larger effects on the number of high-effort activities and activity length in the short-term, compared to I2C-interactions. In the long-term, I2C-interaction was related to slightly larger effects on the overall number and diversity across activities (i.e., high and low), compared to C2C-interactions. Thus, it can be concluded that C2C-interaction seems to be an especially strong driver of high-impact efforts in the short-term and I2C-interaction to be an especially strong driver of diversity across activities in the long-term. More differences among the two types of social interactions could be identified when looking at the psychological engagement effects.

The *qualitative study* showed that perceived benefits from experienced I2C and C2C-interaction differed. I2C-interaction aroused states of contentment, delight and elation. It was positively perceived as a mean to strengthen the relationship with the initiator due to enhanced social intimacy and brand personification. In addition, crowdsourcers valued gaining recognition for one's effort and the feeling of making an impact. This can be translated into perceived social and personal integrative benefits, as defined by Blumler and Katz (1974). As a consequence, signs for an affective commitment formation towards the initiator could be identified, such as an inclination to stay with the initiator for emotional reasons and further support him as well as showing loyalty behaviors beside of return intentions (e.g. word of mouth, referral), (Schulten & Schaefer, 2015).

In comparison, C2C-interaction fostered cognitive involvement and had an activating and rather inspirational effect on crowdsourcers. Perceived benefits were especially related to learning, understanding and sharing valuable information across members. In addition, the feeling of pride was also mentioned, but less from a recognition and impact perspective and more from an ownership perspective. This relates to the signaling theory, stating that recognition of others signals competence and thus motivates to continued participation

(Lerner & Tirole, 2002). As a consequence, crowdsourcees developed a more rational form of commitment that seemed to be directed towards the task and the project itself, rather than the initiator or other crowdsourcees. Thus, commitment in this case can be interpreted as a more calculative state that is dependent on the perceived value of a task or project (Gustafsson et al., 2005).

This is somewhat surprising, as past research in a community context found that perceived social interactivity from peer-to-peer interaction fosters a 'sense of virtual community' and affective commitment (Koh, Kim, & Kim, 2003; Schulten & Schaefer, 2015). Based on these observations, it can be assumed that crowdsourcing environments differ from other type of communities such as brand-communities, where consumer interaction is rather a mean for hedonic benefits (e.g. entertainment, sharing brand love), while here task achievement is in the center of a crowdsourcee's activity.

Hence, based on insights from the *quantitative* and *qualitative* study it can be concluded that formed engagement through social interaction needs to be differently defined for short and long-term effects. As predicted, in the long-term, the *quantitative study* showed that all suggested engagement indicators by Nguyen et al. (2015) i.e., *number, length and diversity* of overall activities, were positively affected by social interaction. The qualitative study strengthened the assumption that this was due to commitment formation and differently perceived benefits. While *C2C-interaction* seems to foster *rational commitment towards the task* due to perceived personal and cognitive benefits; *I2C-interaction* seems to foster especially *affective commitment towards the initiator*, due to perceived social and personal integrative benefits. Affective commitment is known to have an even stronger and more lasting effect on crowdsourcee's behavior as it is expressed as a holistic or aggregate judgment of an engagement object, independent from its functional attributes (Gustafsson et al., 2005).

Nevertheless, none of the engagement indicators were positively affected in the short-term. Instead, exploratory assessment of the different types of crowd activities showed that an *effort-shift* from low to high happened. Due to the fact that this generally illustrates an advantageous change for the initiator and the crowdsourcees in terms of potential value creation (while more voluntary energy is invested from a crowdsourcee's perspective), it clearly can be perceived as a *short-term indicator of crowdsourcing engagement*.

As data from the *qualitative study* offers no logical explanation for that, one possible explanation is offered by the logic of the *yield shift theory (YST) of satisfaction* (Briggs et al., 2008). This theory from the field of information systems (IS), helps to explain the onset of and variation in the magnitude and valence of the satisfaction response and consequently the behavioral response towards a virtual artefact, with the ultimate goal of explaining IS success.

YST derives two propositions from five assumptions to propose that variations in the satisfaction response are caused by shifts in yield for an individual's active goal set.

It argues that the yield for a given goal is a function of the utility an individual ascribes to the attainment of that goal, but reduced in inverse proportion to the likelihood an individual assesses of attaining the goal. The utility an individual ascribes to attaining a goal may be fluid, changing in response to new information and experiences. According to Briggs et al. (2008), the logic of YST implies three reasons for shifts in yield for the active goal set: 1) a change in the utility that people ascribe to one or more goals in the active set; 2) a change in the perceived likelihood people assess of attaining one or more goals in the active set; or 3) a change in the goals itself that comprise the active set.

Relating this to the case of this study, it can be assumed that with each experienced social interaction the *overall goal* for crowdsourcees to participate in the initiative may have changed or intensified as well as the perceived likelihood of achieving new or existing goals, which may have caused a *yield shift* that fostered high-effort and impact contributions in the short-term and more overall engagement in the long-term. More specifically e.g., a crowdsourcee with the initial goal in mind of improving the value-in-use of a product that is personally relevant to them, who experiences I2C-interaction, may suddenly identify new or additional benefits in participating in this project. That is, by having this interaction with the initiator, he or she feels more connected to the crowdsourcer and builds a personal relationship. The goal is not anymore to just contribute for product improvement reasons but also to support the initiator and to further feed the relationship that arouses delight and fulfills the human need for social closeness and attention (Moon, 2000; Walther, 1992).

In comparison, a crowdsourcee, who experiences C2C-interaction and who identifies the personal integrative benefit of participating in such a project, may intensify the feeling of ownership of his or her contributions and develop a need for showing more skills and knowledge to other consumers with the goal of getting even more recognition and attention (Lerner & Tirole, 2002; Soliman & Tuunainen, 2015). Nevertheless, those, for whom the cognitive benefits become more salient through C2C-interaction, may identify the goal of learning from others and gaining more technical knowledge.

In both cases, the utility of putting effort into the task increases with identifying other benefits and the likelihood of achieving those goals rises by putting even more effort in it. Consequently, the change in perceived utility and likelihood shifts the yield of the overall effort, which in turn may explain the observed shift from low to high-effort task (especially after C2C-interaction) and higher overall engagement (especially in the case of I2C-interaction) in the long-term.

Consequently, looking at the findings from both types of studies, informed by the insights from the logic of the YST of satisfaction, the original proposition that social interactivity fosters crowdsourcee's engagement due to its diverse benefit potentials can be further refined:

Generalized Proposition:

- (a) Social interactivity** has a general positive long-term effect (i.e., after 7 days) on psychological and behavioral engagement outcomes.
- (b) Social interactivity** causes a short-term effort-shift from low to high-impact contributions (i.e., within 7 days), due to a change in perceived yield.
- (c) Crowd-to-Crowd (C2C) interaction** fosters short-term satisfaction responses related to cognitive and personal-integrative benefits and drives rational commitment towards the task in the long-term.
- (d) Initiator-to-Crowd (I2C) interaction** fosters short-term satisfaction responses related to social and personal-integrative benefits and drives affective commitment towards the initiator in the long-term.

6.9 Limitations

Finally, it needs to be mentioned that this study comes not without limitations and findings need to be treated with caution as generalizability may be limited.

The proposed research model for the mixed methods study (Figure 26) illustrates an abstraction of the reality and many more factors may impact an experience and related engagement processes. It disregards the influence of personality, context-factors related to the platform-environment, and the content of interaction-related communication (e.g., comments or posts). Hence, future research should incorporate other control- and moderating variables as well as content-assessment e.g., through text-analytics methods.

Additionally, findings are based on a single case. Although the case was selected due to the fact that it incorporates all characteristics of a typical and above average crowdsourcing case with many options for social interactivity, it still may not reflect the reality of all types of projects and platforms. Future research may be extended to other cases with even larger crowds and additional interviews may be conducted to compare and validate findings.

Lastly, while this study had a more exploratory character due to the novelty of the topic of engagement as well as the research field of crowdsourcing, based on those findings future studies may use more traditional research designs (e.g., surveys) and methods (e.g., structural equation modelling) to test effects from the framework.

6.10 Conclusion

By quantitatively assessing the impact of different types of social interactions (i.e., I2C vs. C2C) on multiple behavioral engagement indicators in the short and long-term, and qualitatively exploring the underlying psychological mechanism and perceived benefits,

refined propositions and an advanced research model of the *crowdsourcing engagement process* were developed.

This study extends the existing knowledge in the research fields of crowdsourcing and engagement and dissolves contradictory findings from prior studies by overcoming conceptual and methodological weaknesses. Surprising results regarding the short-term effort-shift and long-term engagement behaviors as well as the differently perceived benefits and related commitment states for I2C and C2C-interaction were found. C2C-interaction was found to be an especially strong driver of high-impact efforts in the short-term, fostering rather calculative commitment states towards the task and project itself in the long-term. In comparison, I2C-interaction was found to be an especially strong driver of diversity across efforts in the long-term, fostering affective commitment states towards the initiator, which are known to be more lasting as future participation decisions are independent of the task and topic. The logic of the yield shift theory (YST) of satisfaction, proposing that variations in the satisfaction and related behavioral response are caused by shifts in yield for an individual's active goal set (Briggs et al., 2008), offers a possible explanation. An advanced model, illustrating the impact of social interactivity on engagement state formation and behavior is proposed (Figure 30).

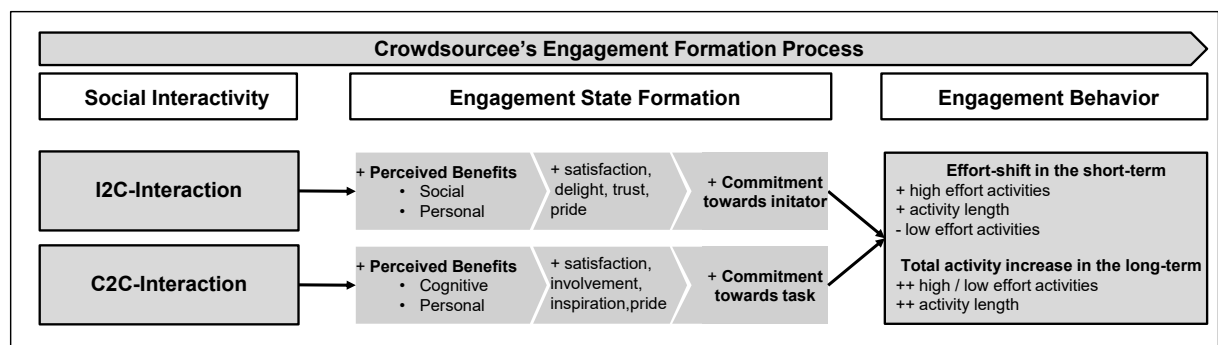


Figure 30. Refined Model of the Engagement Process

Source: Own Illustration

By taking a more fine grained look at the engagement measures and considering temporal differences, this study helps to better understand, why prior studies only predicted effects of social interaction on emotions but not behaviors (e.g., Boons et al., 2015; Martinez, 2015) or contradictory findings on the desire for I2C-interaction verses C2C-interaction (e.g., Brawley & Pury, 2016; Deng et al., 2016; Jeppesen & Frederiksen, 2006; Literat, 2017) as well as differences between initial and repeated interaction (Chan et al., 2015; Chen et al., 2012).

Once more, this study showed, how complex the concept of engagement is and that effects of drivers like social interaction need to be assessed very carefully and from different angles to avoid jumping to misleading conclusions. Answering the question, whether social interaction is a driver of *crowdsourcing engagement* with a clear yes or no is not sufficient.

Instead, the when and how needs to be considered in more detail to fully understand its effect.

Nevertheless, those findings support practitioners with insights on how social interaction may be effectively used. C2C-interaction should be triggered to motivate cognitive involvement with the task and stimulate contributions from crowdsourcees, who value recognition from others. In addition, I2C-interaction can be strategically used to foster long-term commitment that goes beyond the specific task and project context and may be especially useful, if return for future iterations or other crowdsourcing projects is desired. Also, I2C-interaction may be more relevant for projects where tasks are rather boring and repetitive and crowd participation is harder to sustain. Thus, it is not about the question of either/or – instead, this chapter concludes by arguing that humanizing crowdsourcing platforms by fostering both forms of social interaction, creates complementary value by enhancing initial platform activity related to the task and long-term stickiness related to the initiator. Both is necessary for holistic crowdsourcing success.

Chapter VII

Conceptual Work: Broadening the View

Value Proposition Co-Creation - A Modernized View on Crowdsourcing with Consumers

7 Value Proposition Co-Creation in Virtual Environments – A Modernized View on Crowdsourcing with Consumers

This Chapter offers a modernized perspective on crowdsourcing with consumers. It is a reaction to a couple of reviewer comments that were received throughout the lifecycle of this dissertation project. While crowdsourcing seems to be widely known, with a relatively large research community, many different sub-forms exist and contradictory and ambiguous terms as well as outdated views are used. Hence, by taking on a service-research perspective, this chapter offers a broadened view that specifically applies for crowdsourcing projects with consumers and that is grounded in the service-dominant logic.

7.1 Introduction

Doritos, the triangular chips brand, has engaged consumers globally to collect advertisement ideas for their *Crash the Super Bowl* campaign and gained more than 32,000 submissions in 10 editions, which led to top-ten rankings among Super Bowl ads (Roth et al., 2016). *My Starbucks Idea* has seen over 100,000 submissions from consumers in four years that helped to improve and generate more than 300 new services and products (Lee & Seo, 2013). Last, but not least, PepsiCo has solicited input from consumers on new flavors and received over 14 million submissions, while the winning flavor contributed to an 8 percent increase in sales, following its launch (Forbes, 2014).

These exemplary projects have a few things in common: 1) most importantly they all involved an open call via an online platform to a consumer crowd, who voluntarily agreed to participate; 2) they all involved a task that was closely related to the development, improvement or communication of the core product; 3) no financial rewards were offered to motivate consumers to contribute; 4) and no (for consumer visible) platform intermediary was involved (i.e., the initiating company was known to all contributors and served as the direct point of contact).

So far, this dissertation referred to these types of projects as *crowdsourcing*, which is fully in line with common definitions and serves as an umbrella term for many forms of crowdsourcing activities that can be found in the market and literature (e.g., Blohm et al., 2013; Brabham, 2008; Estellés-Arolas & González-Ladrón-De-Guevara, 2012; Geiger et al., 2011; Howe, 2006; Leimeister et al., 2009). Yet, the term *crowdsourcing* is not exclusively related to activities with consumers, but can also refer to compensated work with external professionals like in the case of Amazon Mechanical Turk (Estellés-Arolas & González-Ladrón-De-Guevara, 2012).

Looking at the literature, many more terms and definitions can be found across research fields that try to better and more precisely describe these types of projects. For example, *open innovation* is often heard, which falls under the crowdsourcing term and refers to ideation activities only (Terwiesch & Xu, 2008). In an attempt to use a broader and more flexible term, *co-creation* is sometimes heard (Füller, 2010).

However, this term has very diverse meanings, e.g., according to the *Service-Dominant Logic* (SDL) it describes the process of resource integration between a consumer and a producer during the consumption phase (Vargo, Maglio, & Akaka, 2008). Others suggested to replace co-creation with *customer participation* to be more consumer-specific (Dong & Sivakumar, 2017). Yet, this term is also used in different contexts, like voluntary participation in pre-sales activities (Mustak et al., 2013) as well as mandatory participation, related to consumption activities (Dong & Sivakumar, 2017). And many more abstract and contradictory terms can be found that all try to describe the same thing. Hence, the following questions arise:

What exactly are those projects that we used to call Crowdsourcing so far?

What is an appropriate philosophical foundation for Crowdsourcing projects that involve consumers?

At first sight, one could conclude that these companies did an excellent *crowdsourcing job* as their crowd's generated impressive outcomes throughout the project's lifecycle. However, those extremely successful companies did not just recognize the general power of the crowd when it comes to outsourcing a task to external contributors and winning free resources and creative minds, but much more importantly, that *consumer-centricity* is not limited to the sales process but can start long before offers are launched to the broader market.

Taking a step back from the traditional literature (that is used to study the crowdsourcing phenomenon) and taking on a *service-research* perspective, it gets clear that what these firms actually managed to do is building a strong relationship with their consumers by inviting them to *co-create value propositions* (i.e., a firm's offerings) for maximizing the *value-in-use* (i.e., the actual value that the consumer creates while using a service or product). According to the *Service-Dominant Logic* (SDL), what precedes and follows the transaction as a firm engages in a relationship with a consumer is more important than the transaction itself and the service provision can only be maximized through an iterative learning process on the part of both (Vargo & Lusch, 2004).

Thus, in line with SDL and to avoid future confusion with ambiguous terms, this chapter summarizes these activities by introducing the concept *value proposition co-creation in virtual consumer environments* (VPCC in VCE).

This chapter aims to:

- (1) Provide an *exhaustive literature review* on relevant SDL concepts.
- (2) Introduce the concept of *value proposition co-creation in virtual consumer environments* as a more precise and consistent future description and scientific classification of those projects.
- (3) Provide an SDL-informed, multi-dimensional definition of *platform engagement for value proposition activities with consumers*, as a holistic measure of crowdsourcing success.

7.2 The Service-Dominant Logic (SDL)

According to the *Service-Dominant logic* (SDL), a modern meta-theoretical framework that explains value creation, all economies are service economies and all exchanges can be viewed as the reciprocal application of resources for other's benefit, sometimes referred to as service-for service exchanges (Vargo & Lusch, 2004).

In contrast to the goods-dominant view, value creation does not take place through the simple exchange of units of outputs. Instead, it is co-created by multiple actors (e.g., the firm and the consumer) and can only be determined by the beneficiary in the context of use of the exchanged resources, following the exchange transaction (Vargo & Lusch, 2004, 2008, 2016).

Thus value is not just provided through the act of pushing an offer to the market and making it available for consumers, who then take on the role of passive buyers. Instead, goods are only distribution mechanisms for service provisions and beneficiaries must engage in a process of voluntary resource integration (e.g., skills, knowledge) to maximize value creation (Vargo & Lusch, 2004).

That is why SDL argues that firms cannot develop and deliver value to consumers by bundling knowledge into goods. Instead, they can only initiate the *value proposition* (Vargo & Lusch, 2004). Value propositions in the SDL perspective refer to the goods and services itself that a company creates and must be considered as a promise to the consumer that some form of value can be gained (Grönroos & Voima, 2013). The act of buying and paying an offer represents only an indirect part of the service exchange and can be understood as the right for future service, masking the fundamental basis of exchange (Vargo & Lusch, 2004). This process is illustrated in Figure 31.

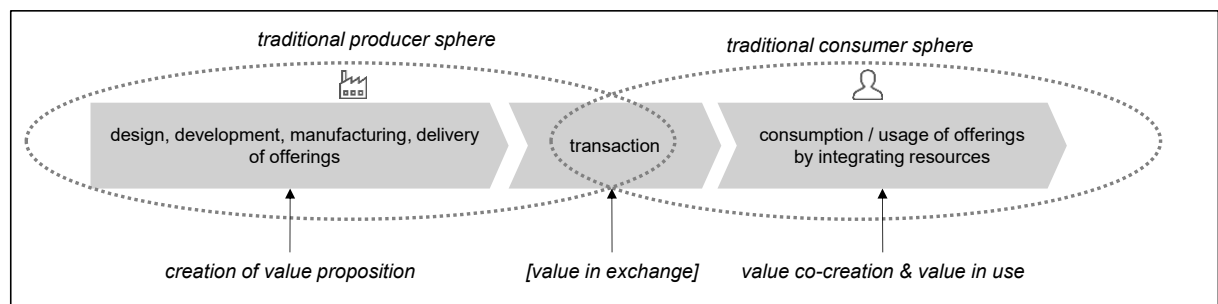


Figure 31. Value Co-Creation Illustrated

Source: Own Illustration

Hence, by definition, the service-centered view is a highly consumer-centered view that must begin with an in-depth understanding of the consumer's problems and needs in order to identify a proper solution that maximizes value-in-use (Vargo & Lusch, 2004). It also implies that firms need to reconsider the way of developing and producing their value propositions. To maximize value during consumption within the consumer's context, it seems most natural to interact with consumers long before offers are produced and launched (Kowalkowski, Persson Ridell, Røndell, & Sörhammar, 2012). Vargo and Lusch (2004) suggest that an implicit part of the service-centered view is to "cultivate relationships that involve consumers in developing customized, competitively compelling value propositions to meet specific needs" (p.5). They further elaborate that what precedes and follows the transaction as the firm engages in a relationship with a consumer is more important than the transaction itself and the service provision can only be maximized through an iterative

learning process on the part of both, the consumer and the firm. Kowalkowski et al. (2012) refer to this process as the *co-creative practice of forming the value proposition*.

7.3 The Concept of Value Proposition Co-Creation in Virtual Consumer Environments

Recent advancements in information and communication technology have enabled firms to tap into the creative potential, knowledge and broad-based experiences of their targeted, external stakeholders to absorb the volume and variety of crowdsourced data (Blohm et al., 2013). Overcoming companies' boundaries and integrating consumers into the early and later development stages of products and services is becoming more and more mainstream. As outlined in the introduction, terms such as crowdsourcing (Estellés-Arolas & González-Ladrón-De-Guevara, 2012), customer participation (Mustak et al., 2013), customer integration (Moeller, 2008), open innovation (Terwiesch & Xu, 2008) or even co-creation (Füller, 2010) have multiple meanings and conflicting definitions. In order to avoid confusion, negative associations, and to offer a more consistent and thought-through expression that aligns with SDL, those activities are here summarized by the umbrella term *value proposition co-creation with consumers*.

As the lower part of Figure 32 shows, *value proposition co-creation* is the act of integrating consumers already before the transaction and consumption process, i.e., extending the joint-sphere of consumer and producer, by inviting them to co-create value propositions with the goal of maximizing the value-in-use in a later stage. In traditional settings, the producer is solely responsible for the creation of the value proposition (e.g., design, development, and delivery of offerings) and co-creation takes only place during the consumption phase. In a more consumer-oriented setting, consumers are engaged already in the creation of the value proposition and hence value facilitation in the consumption phase is more likely.

Compared to market research, the novelty of *value-proposition co-creation* is that consumers are not only asked about their opinions or needs, but to actually contribute their creativity and problem-solving skills (Füller, 2010), depending on the roles they take, like product conceptualizer, designer, tester, support specialist or marketer (Nambisan & Nambisan, 2008).

For *value proposition co-creation* to take place, *virtual consumer environments* illustrate the most cost-effective and feasible form for connecting with a large, global and diverse group (Nambisan, 2002). Those virtual environments are company-hosted online platforms that offer facilities for (ongoing) communication and interaction between consumers and the initiating company e.g., ranging from simple online discussion forums to virtual ideation, design, voting, prototyping or testing centers (Nambisan, 2002; Nambisan & Baron, 2007; Nambisan & Nambisan, 2008).

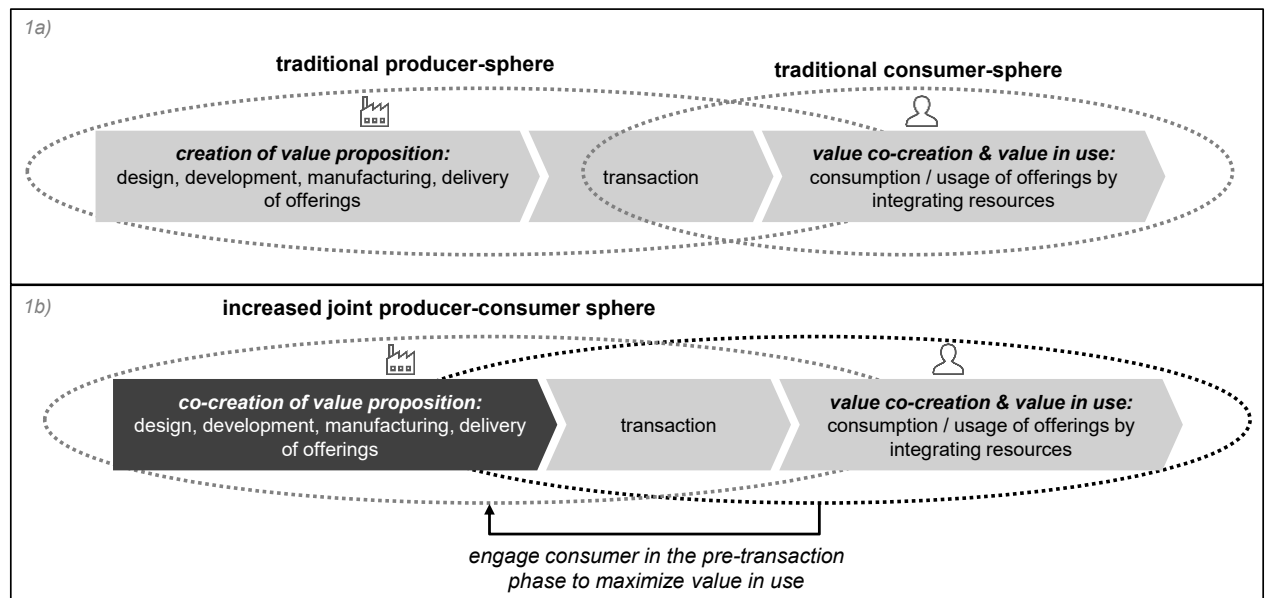


Figure 32. Value Proposition Co-Creation and Value Co-Creation Illustrated

Source: Own Illustration

7.4 Research Questions

The economic benefits and thus motivation for the initiator to democratize the development process seem very intuitive as it improves the relationship with their consumer base and assists in developing offers that better facilitate value co-creation, while outsourcing part of the development activities to the consumer (Blohm et al., 2013; Mustak et al., 2013). A classical win-win proposition, which can be translated into increased business value (e.g., growth, marketing effects, speed to market). However, inviting motivated consumers to participate and building a platform for collaboration and contribution alone, may not be enough to form a loyal, contributing consumer crowd.

While consumer participation for the act of value co-creation according to SDL is mandatory (i.e., through use), *consumer participation in the creation of the value proposition is optional* (Dong & Sivakumar, 2017). Thus, from a consumer perspective, participation in *value proposition co-creation* seems less intuitive and a comprehensive understanding of the contributor perspective is still missing (Füller, 2010; Mustak et al., 2013; Nambisan & Baron, 2009). One may argue that participation offers a consumer a new form of control and voice when it comes to the creation of an offering that ultimately impacts the value-in-use (Mustak et al., 2013). In spite of that, it also means that consumers need to take on a new job and invest additional resources (e.g., skills, knowledge, time), which they did not have to invest in the past.

Due to the fact that consumers typically self-select themselves and decide to participate voluntarily and often spontaneously, an initial form of involvement and general interest is a prerequisite (Sawhney, Verona, & Prandelli, 2005). Yet, as prior studies showed, initial

involvement and interest is no guarantee for sustained activity (Mano & Oliver, 1993; Oliver & De Sarbo, 1989) and also initial satisfaction with a system does not guarantee continued satisfaction (e.g., Liu & Khalifa, 2003) or sustained use (e.g., Reinig, Briggs, Shepherd, Yen, & Nunamaker Jr, 1995).

In contrast to open-source software projects, where participants immediately benefit from using programmed codes which may serve as a driver of continuous contributions, consumers participating in value proposition co-creation will hardly ever be able to directly benefit from their efforts (Füller, 2010). Often, there is a significant time lag between the co-creation experience and access to the final product as well as the general risk of limited impact due to execution constraints from the producer-side.

Still, successful initiatives with huge crowds and loyal consumers exist. Hence, other, potentially more subtle benefits (e.g., related to the co-creation experience itself and not just the project outcome) must be triggered and perceived by contributors that drive ongoing platform activity.

7.5 Platform Engagement as a Success Measure for VPCC in VCEs

Kowalkowski et al. (2012) suggest that the co-creative practice of forming a value proposition i.e., the reciprocal exchange of knowledge prior to value actualization, is mediated by the concept of *engagement*. Only engaged consumers invest resources, meaning they provide a voluntary service to themselves and others to co-create value propositions with a greater value-in-use potential.

The term *engagement* is used in several research contexts, e.g., marketing, information systems (IS), and organizational behavior (OB). Hence, context-specific definitions for consumer engagement, user engagement or employee engagement, and more exist, where the engagement subject (e.g., customer, user or employee) and object (e.g., brand, technology or employer) varies.

Storbacka et al. (2016) conceptualize engagement very broadly in an SDL context as “an actor’s disposition to engage as well as the activity of engaging in an interactive process of resource integration within the institutional context, provided by a service ecosystem” (p.3009). They further explain that engagement “is based on an actor’s present-day connections that have emerged from past service experiences and are oriented toward future service experiences” (p. 3013). As engagement occurs within shared institutional logics, Storbacka et al. (2016) propose that it is not only a result of actor-specific characteristics, but that the conceptual and physical (or virtual) environment pre-dominantly determines why, when and how actors engage. This environment is also referred to as the engagement platform, consisting of physical or virtual touchpoints that support the exchange and integration of resources (Breidbach et al., 2014).

Storbacka et al. (2016) illustration of engagement is in line with most other conceptualizations, considering a psychological and a behavioral component and assuming different levels of engagement that are dependent on perceived experiences (e.g., Attfield et al., 2011; Brodie et al., 2011; Macey & Schneider, 2008).

According to Brodie et al. (2011), the *psychological dimension* (i.e., the disposition to engage) can be understood as a psychological state that occurs by virtue of interactive consumer experiences with a focal object. Such interactive experiences can cause subjective, internal, and mostly temporary responses, which were identified in past studies as e.g., satisfaction or other forms of arousal (Bowden, 2009; Briggs et al., 2008; Hollebeek, 2011; Sashi, 2012). Those types of satisfaction responses can be understood as backward looking, cognitive-affective evaluations of experiences (Mano & Oliver, 1993; Verhoef, 2003). Over time, those experience evaluations aggregate and intensify into a more persistent and pervasive, affective-cognitive state of mind, that is not limited to a single moment of interaction anymore (Hollebeek, 2011; Schaufeli & Bakker, 2004; Wefald & Downey, 2009). This rather forward-looking state is often translated as a commitment state, by which a consumer has the desire to maintain a relationship in future (Bowden, 2009; Brodie et al., 2011; Macey & Schneider, 2008; Sashi, 2012), either due to more rational (i.e., calculative commitment) or emotional reasons (i.e., affective commitment) (Gustafsson et al., 2005; Mollen & Wilson, 2010).

The *behavioral component* (i.e., the activity of engaging), goes along with the psychological component and can be understood as the behavioral manifestation of the level of engagement that a consumer developed during and after an interaction (Brodie et al., 2011; Kumar et al., 2010; Van Doorn et al., 2010). It is the volitional investment of resources, which can be of tangible (e.g., equipment) and intangible (e.g., knowledge) nature (Hollebeek et al., 2016). Van Doorn et al. (2010) propose different dimensions of engagement behavior, by which the level or intensity can be evaluated e.g., valence (i.e., positive or negative behavior), form (i.e., type of behavior), scope (i.e., temporal and geographic), and impact (i.e., immediacy, intensity, breadth, longevity). Nguyen et al. (2015) suggest that in a value proposition co-creation context, more specifically in the example of an ongoing project where consumers voluntarily participate, the magnitude, diversity, and temporal intensity (i.e., the sustained nature) of measurable effort devoted to a requested task, signals the level of engagement among participating consumers. The magnitude indicator can be understood as the total number of activities that someone does as well as the individual effort that someone puts into an activity, like for example the contribution length in terms of its number of words or characters used.

Consequently, independent of a consumer's original intention to participate in a virtual value proposition co-creation initiative, this chapter argues that those platforms foster higher or lower levels of engagement. Henceforth, *platform engagement* is conceptualized as a process that ideally leads to short and long-term consumer activities due to satisfying experiences that aggregate into a commitment state over repeated interactions.

It is not defined as an end-state by itself but rather a psychological state of different intensity levels that changes over time and that can be observed and measured based on the activities that participating consumers devote to the platform. A high *level of platform engagement* is assumed, when e.g., more, diverse, short and long-term consumer activities are observed, whereas all kind of possible platform activities are accounted for. Depending on the product or service development phase, platform activities can range from more pro-active and impactful efforts that help identifying or solving a problem (e.g., providing ideas, feedback or detecting potential bugs), to less impactful efforts that still may have an indirect value like helping to evaluate the contributions from other consumers (e.g., voting or liking ideas of others) or providing context for others (e.g., making a profile update that says something about ones competences and skills). Thus, platform engagement is not just about a single activity's value or impact but more about a consumer's general level of activity over time and thus serves as a more holistic indicator of platform success than e.g., only accounting for the number of ideas submitted.

In order to foster satisfaction responses in the short-term and commitment states in the long-term, accompanied by desired short-term and long-term engagement behaviors, specific experiences are supposed to dominantly impact the platform engagement process. Prahalad and Ramaswamy (2004) believe that the opportunities for value creation are enhanced significantly for firms that embrace the concept of *personalized co-creation experiences* as the source of unique value. They suggest that personalizing the co-creation experience means fostering individualized moments of high-quality interactions and experience outcomes anywhere throughout the consumer journey, including pre-purchase interactions such as value proposition co-creation activities.

Even in the new co-creation space, companies have at least partial control over the experience environment and the communities they build to facilitate co-creation activities. Hence, Prahalad and Ramaswamy (2003) state that the task of the firm is to create a robust and engaging experience environment, one in which infrastructures and capabilities are centered on co-creation through high-quality interactions and personalized co-creation experiences.

Thus, as value shifts to experiences, *virtual value proposition co-creation initiatives* must be seen as a forum for conversation and interactions and not just a passive collection of information.

7.6 Discussion and Conclusion

This chapter started by raising attention to the many different terms and sub-classifications that evolved over the last decade to describe crowdsourcing projects. While the term *crowdsourcing* seems for many purposes too broad, *open innovation* too narrow and alternative concepts as *co-creation* or *customer participation* too ambiguous; another issue is that all of them miss an appropriate philosophical foundation. This has led to the fact that

crowdsourcing evolved to an own type of research field or sub-field with cross-scientific influences and impact. This comes with its own complexities, like a wide spread of crowdsourcing-related studies across disciplines as information science, marketing, organizational psychology, and many more as well as many inconsistent and contradictory observations and assumptions due to the huge variety of projects across the broad field of crowdsourcing that are hardly comparable (e.g., related to the task, participant group, and initiator).

For that reason, this chapter aimed to identify and map an appropriate philosophical foundation, one that is specific for the type of crowdsourcing projects that are assessed in this dissertation (i.e., crowdsourcing with end users for the development, improvement, or communication of a crowdsourcer's offering closely related to its core). *Value proposition co-creation in virtual consumer environments* was introduced as a new term to better describe and scientifically embed these projects. One may argue, that this is just another new term that extends the list of alternative descriptions of crowdsourcing projects? However, compared to all existing terms, the concept of *value proposition co-creation in virtual consumer environments* is based on the primary tenets of the service-dominant logic and its value is manifold:

First, it provides the crowdsourcing phenomenon with consumers a scientific home with already established principles and a rich and enthusiastic community that can provide models and insights that shed more light on suitable success definitions and criteria of effective crowdsourcing systems (Vargo & Lusch, 2016). An example for that is the SDL-informed, multi-dimensional definition of *platform engagement for value proposition activities with consumers*, which was proposed as a holistic measure of success and also has its origins in service science (Hollebeek et al., 2016).

In addition, by that a modernized perspective of crowdsourcing is proposed. Looking at the crowdsourcing literature, it is observable that most of the time a rather traditional, good-dominant (GD) view is taken. One in which the central purpose of the firm is to develop, produce and sell outputs in the most resource efficient way (Lusch, Vargo, & Wessels, 2008). Many studies in the crowdsourcing field are conducted with the aim to proof the value of crowdsourcing as a new form of outsourcing and an approach for fastening product development and increase innovative capabilities (e.g., measured by the quantity and quality of contributions only) to ultimately create offerings that sell better. By comparison, SDL focuses on the interaction between the firm and the consumer, which implies developing a dialog between parties that is founded on trust, collaborative learning and adaptation to each other. The significance of that interaction is found not in the transfer of ownership of output as in GDL, but in the interaction itself and servicing the needs of each other (Lusch et al., 2008).

Lastly and closely related to the latter section, the concept of *value proposition co-creation in virtual consumer environments* does not only benefit the research field of crowdsourcing itself but also extends the field of service science. By enriching SDL with the crowdsourcing

concept, the idea of an end-to-end consumer-centric process in which value co-creation starts already with the development of the value proposition is extended. Rather than finding a more effective or efficient way to produce outcomes, involving consumers right from the beginning of the value chain for the purpose of creating a better experience is very much in line with the core idea of SDL.

Concluding, this chapter offered a broadened view of crowdsourcing, one grounded in the service-dominant logic. It is argued that a conceptual foundation of crowdsourcing with consumers based upon SDL has the potential to become the platform from which to properly view crowdsourcing as value creating systems (with the consumers in the center). SDL (and the SDL-informed concept of platform engagement) provides a framework for theorizing, confirming, and refining the foundation of crowdsourcing systems.

Chapter VIII

Conclusion

*Summary of Findings, Contributions and Further
Research*

8 Conclusion

“Remember outsourcing? Sending jobs to India and China is so 2003. The new pool of cheap labor: everyday people using their spare cycles to create content, solve problems, even do corporate R & D”

This thesis started by citing Howe (2006) famous introduction of the crowdsourcing phenomenon. Based on the insights provided here, the following update for this famous quote is suggested:

“Remember crowdsourcing? Making an open call to an anonymous crowd and using them as cheap labor is so 2012. The secret recipe for successful value proposition co-creation: inviting (potential) consumer in the pre-transaction phase to maximize their value in use by crowd- testing products (pre-launch), promising a fair monetary reward (post-project) and ensuring appreciative crowdsourcer-interaction (during the participation phase), while outsourcing risk factors to an intermediary.”

This thesis is among the first that deals with the question of *what determines an engaging crowdsourcing experience and how can it be effectively managed*. Applying the engagement concept to the case of crowdsourcing as a foundational construct for crowdsourcing success and deploying a mixed methods research approach is a first step in offering researchers and practitioners from diverse fields a new perspective on the holistic evaluation of crowdsourcing activities.

By investigating and discussing a wide range of literature and rich sources of qualitative and quantitative crowdsourcing data provided by the crowdsourcing consortium of the University of St.Gallen, the concept of the *crowdsourcing experience* and the closely related *process of engagement* was introduced and key learnings on relevant *engagement drivers* derived.

In addition to the contributions to the current body of knowledge, this thesis offers several contributions for the managerial practice. To make the contributions more tangible, they were transformed into an illustrative model and an eight-step guide for managing *crowdsourcing engagement* strategically throughout the three phases of planning, managing and measuring.

8.1 Summary of Findings

Chapter II and III (Research Foundations and Multiple Case Study)

In a first step, based on a *crowdsourcing journey* blueprint derived from a broad range of diverse crowdsourcing projects and a theoretical conceptualization of the engagement process, four in depth case studies were conducted to explore the role of different interaction points for engagement formation. Four types of stimuli groups throughout the *crowdsourcing journey* were identified that differently affected the engagement process:

- **Door openers** refer to stimuli that must arouse positive emotions or at least neutral states at the very beginning of an interaction process to motivate a crowdsourcee to actually take part in the initiative. In the observed cases, this was enabled by the initial *invitation communication* that was sent to the crowd in the beginning of the process.
- **Risk factors** refer to stimuli that in the best case foster a neutral state, while bad experience perceptions lead to negative emotional arousal. Here, the stimuli registration, platform, and reward were observed to be such *risk factors*.
- **Game changers** refer to stimuli that have the potential to arouse all types of satisfaction responses, even highly positive and negative emotions, depending on the experience perceptions. They are assumed to have substantial impact on the subsequent stimuli evaluations as well as the overall commitment state. Here, the task and crowdsourcer-interaction were observed to be *game changers* throughout the interaction.
- **Value adders** refer to stimuli that only foster positive emotional arousal due to surprise without causing any harm if their performance is bad due to their unexpectedness. Here, mainly the object of interest was observed to fall into that category.

Based on these findings, three potential relationships between *game changer arousal* and specific end-states could be observed, independent of the experience evaluations with other stimuli. First, it was found that positive emotional arousal with *game changers* was related to affective and calculative commitment states (ACC), while the opposite was observed (no commitment) when negative arousal happened. If no arousal at all was sensed, only calculative commitment states (CC) were identified. Based on this, three generalized propositions were developed.

Chapter IV (Deep dive: Role of a Crowdsourcing Intermediary)

In a second step, a deep dive on the role of a *crowdsourcing intermediary* for engagement formation was conducted. As some of the consortium members incorporated a crowdsourcing intermediary and outsourced part of the process like platform management, crowd-recruitment and onboarding as well as payment to a third party, the question arose in how far this affects *Crowd Engagement*. Hence, findings from consortium projects with

and without an intermediary were compared. A closer look at the *crowdsourcing experiences* and related engagement processes of mediated and non-mediated cases revealed that in general, affective commitment can be formed in both set ups. Surprisingly, in mediated cases an even stronger affective commitment developed towards the crowdsourcer, while commitment towards the intermediary was either not developed or of a purely rational nature. This was explained due to the different types of stimuli that intermediaries and crowdsourcers usually own and manage. Hence it was concluded that crowdsourcers, who incorporate intermediaries, theoretically have the potential to generate a desired commitment state, when recognized and perceived stimuli under their control belong to the group of *game changers* and *value adders* and the intermediary mainly controls *risk factors*. Based on this, two generalized propositions were developed.

Chapter V (Deep dive: Role of Monetary Incentives)

As the multiple case study provided only limited insights on the role of rewards in the first place, and assumptions on the advantage of attracting intrinsically motivated crowdsourcers existed, the consortium requested an empirical assessment in how far rewards influence the engagement process. By comparing crowdsourcing projects with and without initially promised monetary rewards, it was found that against consortium's and researchers' expectations, crowdsourcers who expected and received monetary rewards sensed stronger emotional arousal throughout the rest of the *crowdsourcing journeys* and developed even more often affective commitment towards the end. One explanation for those observations was that by providing a reward for participating in the crowdsourcing project, the crowdsourcer's expectation related to the *crowdsourcing experience* itself is lowered. In contrast, the fact that crowdsourcers are compensated with a monetary incentive may signal that participation brings no or only limited other forms of value. Based on the observations and the insights from the literature on expectancy theory, it was concluded that crowdsourcers, who promise and provide monetary rewards, may have a higher chance of exceeding initially lower expectations and arousing positive emotions. This, in return, may then increase the likelihood of affective commitment state formation. Based on this, two generalized propositions were developed.

Chapter VI (Deep Dive: Social Interaction)

The consortium showed special interest in better understanding the game changer *social interaction* as it was identified as a major driver of emotional arousal and eventually commitment. By quantitatively assessing the impact of different types of social interactions (i.e., I2C vs. C2C) on multiple behavioral engagement indicators in the short and long-term, and qualitatively exploring the underlying psychological mechanism and perceived benefits, interesting findings were made. As predicted, the *quantitative study* confirmed that social interactivity, in form of I2C and C2C-interaction, was positively related to overall more engagement in the long-term. However, in the short-term it was observed that the number of total activities as well as the diversity across activities was either not affected at

all or even negatively related to social interactivity. By differentiating low-effort activities from high-effort activities, an effort-shift took place that was positively related to experienced social interactivity. The logic of the yield shift theory (YST) of satisfaction, proposing that variations in the satisfaction and related behavioral response are caused by shifts in yield for an individual's active goal set, offered a possible explanation.

The qualitative study strengthened the assumption that this was due to commitment formation and differently perceived benefits for the two types of social interactions. *C2C-interaction* was found to trigger especially rational commitment towards the task and the initiative itself, due to perceived cognitive benefits. In contrast, *I2C-interaction* was found to trigger more affective commitment towards the crowdsourcer directly due to perceived social integrative benefits, with the consequence that crowdsourcees felt the need to support the crowdsourcer beyond the project boundaries. This explains, why *C2C-interaction* fostered activities within the participation phase slightly stronger, while the ladder seemed to foster rather lasting loyalty behaviors.

Chapter VII (Conceptual Work: Modernized View on Crowdsourcing)

In the last chapter a modernized perspective on crowdsourcing with consumers is provided, in response to an identified ambiguity regarding existing crowdsourcing terms and a missing philosophical foundation of the crowdsourcing phenomenon that reflects a more modern view. Looking at the crowdsourcing literature, it is observable that most of the time a rather traditional, Good-Dominant (GD) view is taken, one in which the central purpose of the firm is to outsource processes and activities in the most resource efficient way. This explains, why major contributions in the crowdsourcing literature focused on themes such as process efficiency, contribution quality and quantity or the absorption of knowledge. Based on the learnings provided in this thesis and all the discussion with consortium partners, a broadened view of crowdsourcing, one grounded in the Service-Dominant Logic (SDL) is proposed. SDL focuses on the interaction between the firm and the consumer and not on the transfer of ownership of output. Thus, in line with SDL and to avoid future confusion with ambiguous terms, this chapter summarizes these activities by introducing the concept of *value proposition co-creation in virtual consumer environments (VPCC in VCE)*. It describes the act of interacting with consumers already before the transaction- and consumption process takes place, i.e., extending the joint-sphere of consumer and producer, by inviting them to co-create value propositions with the goal of maximizing the value-in-use in a later stage. In addition, a SDL-informed concept of platform engagement as a success measure for VPCC in VCE is provided to complete the modernized view on crowdsourcing.

8.2 Theoretical Contributions

The goal of this thesis was to extend existing knowledge in related fields of *crowdsourcing* and *engagement* and dissolve contradictory findings from prior studies by overcoming conceptual and methodological weaknesses. The integration of the two rather new research phenomena has the advantage that valuable knowledge for a broader audience is provided, including researchers from the fields of Information Systems (IS), Human Computer Interaction (HCI), Service Research, Consumer Behavior, Communication Research, Marketing, Organizational Behavior (OB), Consumer Psychology, Management Science, and Social Science. Details regarding the major contributions and research fields are provided in the next few sections.

Theoretical Contribution 1 – Introducing an experience-based perspective for crowdsourcing

As was mentioned in the introduction, the meaning of value and the process of value creation are shifting from a product-centric to an experience-based view, which requires managers to stop thinking solely in terms of tangible outputs and transactional processes, but instead to focus more on co-creation experiences (Prahalad & Ramaswamy, 2004). This can be observed especially in the commercial sector, where new, more experience-oriented business models appear and service processes that put the consumer in the center. In line with that, the academic world also saw the opportunity in supporting and driving this transformation process by studying the theories underlying the antecedents and consequences of constructs like customer experience, customer delight, customer engagement and co – more and more replacing solely performance- and resource-oriented views of the firm. Similarly, new philosophical foundations, such as the introduction of the Service-Dominant logic (SDL), challenging the Goods-Dominant view, were introduced to develop fields like service science and transforming related fields. Looking at well-rated publications in marketing, retailing, and service, *customer experience* as a separate construct is found more and more often over the last decade (e.g., Johnston & Kong, 2011; Lemon & Verhoef, 2016; Meyer & Schwager, 2007; Rawson, Duncan, & Jones, 2013; Schmitt, 2016; Teixeira et al., 2012).

Yet, the arising field of crowdsourcing, ironically despite its newness and disruptive nature in terms of changing the way of value-creation and pushing the boundaries of firms by involving external individuals, seems to be stuck in older patterns and views. Looking at the shocking failure rates of crowdsourcing projects (i.e., 90 percent according to Dahlander and Piezunka (2014)) and the often non-effective way of how the majority of projects are set up and managed (more like an outsourcing project from the last century) a re-assessment and new perspective seems necessary. Hence, inspired by the developments in other research fields, this dissertation project aimed on proposing an experience-based view of crowdsourcing, embedded in conceptual and empirical work. By treating the crowd as social capital and introducing concepts such as the *Crowdsourcing Experience*,

Crowdsourcing Journey and *Crowdsourcing Engagement*, exploring a range of representative crowdsourcing projects and testing hypotheses related to proposed key-engagement drivers, this thesis is the first step towards a modernized view on the crowdsourcing phenomenon. In addition to that and in order to make an even stronger argument, this thesis concludes by proposing the concept of *Value Proposition Co-Creation in Virtual Consumer Environments* and SDL as an appropriate philosophical foundation for crowdsourcing with end-users.

Due to the cross-disciplinary character of the crowdsourcing phenomenon, the introduced experience-based view and related concepts directly contribute to the research field of: a) IS due to the platform-mediated exchange of information across different stakeholders, b) Service Science due to the embedment of crowdsourcing activities in the value-creation process, c) and Management Science due to the need for strategic actions in order to create and derive (additional) value from experience-based processes.

Theoretical Contribution 2 – Introducing engagement as a new success measure for crowdsourcing

In the past, IS-research often dealt with concepts such as *User Acceptance* (e.g., Davis, 1985; Wixom & Todd, 2005), success measures like *Ease of Use*, and more rational definitions of *User Satisfaction* (i.e., meets expectations) as a form of a desired psychological user states (e.g., Ives, Olson, & Baroudi, 1983; Melone, 1990). Those concepts may fit a traditional work context, in which *use* is rather obligatory and a separation exists between buyer and end-users (e.g., a CIO making product decisions and affected employees as end-users). Yet, these concepts seem insufficient and even more outdated for contexts in which *use* and *participation* is highly voluntary (i.e., even if a monetary reward can be earned); value-creation is based on the principles of co-creation, and subjects are driven by a delightful experience.

Therefore, in close relationship to the experience-based view, which is introduced in this thesis, the related concept of *crowdsourcing engagement* is proposed and applied for measuring crowdsourcing success more holistically. In the end, crowdsourcing is all about people and the question of how to motivate them initially and even more importantly of how to keep them motivated and active over time to co-create value with the crowdsourcer. Without engagement, no resource integration can occur and consequently no value can be co-created (Storbacka et al., 2016). While quite some research about the initial motivation to participate exists and many studies conclude that it is often a combination of expected learning opportunities, social interaction and financial remuneration (in the case of crowd work) (e.g., Brabham, 2010; Füller, 2010; Mao et al., 2013; Zhao & Zhu, 2014), no research dealt so far with the topic of sustained motivation and engagement throughout the whole crowdsourcing process and even beyond. Hence, this thesis took a process perspective on crowdsourcing by systematically assessing input-, process-, output- and other related context-factors along the end-to-end crowdsourcees' experience to understand what exactly

determines *crowdsourcing engagement* and how an engaging crowdsourcing journey must be designed and managed. As a result an engagement formation process model was conceptualized and enriched with empirical findings.

In a broader context, this thesis project contributes to the IS literature and delivers insights on the so far under-researched concept of IT-enabled engagement processes between individuals and entities, voluntarily integrating resources, from a psychological and behavioral perspective.

Theoretical Contribution 3 – Supporting the establishment of the engagement concept

Taking an experience-based perspective and assessing associated engagement effects as a form of value-creation is a relatively young and still under-researched aspect in different research fields. Every two years, the Marketing Science Institute asks member companies to select the priorities that will drive research initiatives over the next couple of years. Understanding the *Customer Experience* and the *conceptualization, definition, and measurement* of the *Engagement Concept* were named as a research priority since 2010 as well as the role of emotions and other psychological constructs that affect engagement (MSI, 2010, 2016). While first authors in the field of marketing, consumer behavior, and service science provided ideas for conceptualizing engagement processes (e.g., Breidbach et al., 2014; Brodie et al., 2013; Hollebeek et al., 2014), which served as a great inspiration for the work presented in this thesis, only very limited empirical work can be found.

Due to its voluntary character and the shift in power and dependency, the crowdsourcing phenomenon as a modern form of an IT-mediated *value proposition co-creation (VPCC) approach* between entities and potential and actual consumers (Leimeister, 2014) offers a great opportunity for exploring this novel perspective. Compared to traditional engagement processes, which only take place in the post-purchase phase (i.e., when value co-creation between a consumer and a producer takes place according to the common SDL-view), engagement in the pre-purchase phase, i.e., during VPCC, potential psychological and behavioral effects in form of responses and short-term and long-term platform activities are more diverse and easy to observe and measure, with a higher likelihood of causal relationships. In comparison post-purchase engagement is often reduced to retention and referral alone, which can take time to happen, depending on the type of product or service.

Additionally, in order to qualitatively and quantitatively explore engagement effects, two methods were derived and applied in the context of this thesis. First of all, an adapted form of the Sequential Incident Laddering Technique (SILT), originally proposed by Jüttner et al. (2013) for measuring service experiences, was introduced to identify relationships between stimuli-related experiences and engagement outcomes. Secondly, a method for assessing stimuli-response patterns based on log-data was introduced that not only takes stimuli-specific sequences and a diverse set of responses into account but also considers the time dimension to differentiate between short- and long-term effects. These methods can

also be applied to assess engagement effects, e.g., related to specific service-stimuli, in a post-purchase context.

Hence, by delivering first insights on the end-to-end engagement process (in the context of VPCC) and providing a qualitative and a quantitative method for assessing engagement processes, this thesis supports the progress from an emergent theme to a more mature construct. Thus, in a broader context, insights also contribute to the Marketing, Service and Consumer Psychology and Behavior literature.

Theoretical Contribution 4 – Shedding light on contradictory findings in prior crowdsourcing research

As the initial literature review showed, prior studies that assessed experiences throughout the crowdsourcing journey mostly focused on the impact of individual stimuli perceptions (e.g., process satisfaction) or specific interaction points (e.g., task) on behavior or psychological states. By looking at mainly (causal) relationships between unidimensional definitions of engagement (i.e., in terms of either attitudinal or behavioral metrics such as satisfaction or sustained participation) and individual variables (e.g., goal clarity, task complexity, sense of community) the final engagement outcome and ensuing business value cannot be fully explained. This thesis illustrates the importance of considering the engagement concept's multidimensional character and taking an integrated, end-to-end process perspective that considers different temporal dimensions for evaluating it more holistically.

First, by applying a mixed methods approach and taking a more fine grained look at the engagement measures, this thesis helped to better understand why prior studies only predicted a) effects of *Social Interaction* on emotions but not behaviors (e.g., (Boons et al., 2015; Martinez, 2015); b) contradictory findings on the desire for I2C-interaction verses C2C-interaction (e.g., Brawley & Pury, 2016; Deng et al., 2016; Jeppesen & Frederiksen, 2006; Literat, 2017); and c) differences between initial and repeated interaction (Chan et al., 2015; Chen et al., 2012). Instead, separate effects for different types of social interaction, at different point in times and for different types of responses need to be assessed and discussed. Those insights are especially relevant for the field of Communication Research and HCI.

Additionally, by differentiating between initial motivation and sustained participation engagement, this thesis identified the two-fold effect of monetary incentives on motivation and expectations. While there was a prior believe about intrinsic motivation as an important driver of engagement (De Vreede et al., 2013), this thesis revealed that monetary incentives promised at the beginning of a crowdsourcing journey lowered expectations regarding the *crowdsourcing experience* and hence increased the chance of exceeded expectations during the participation phase and eventually desired engagement outcomes – even for originally extrinsic-driven crowdsourcees. Those insights are especially relevant for the field of Consumer Behavior and Marketing that deal with the concept of expectations and customer

experiences as well as the field of OB, which deals with the topic of employee compensation and motivation.

Lastly, by separately assessing crowdsourcee's experiences with the crowdsourcer and intermediary, this thesis identified a value-creation opportunity by incorporating crowdsourcing intermediaries in such a way that it is actually beneficial for the crowdsourcer, not just from a management perspective (e.g., outsourcing work and accessing a crowdsourcing platform on demand) but also from an engagement perspective, as long as *risk factors* are outsourced and *game changers* owned. Those insights are especially relevant for the field of IS, which often deals with socio-technological systems with unclear borders and a number of different roles and actors as well as the two-sided market phenomenon.

Once more, this thesis shows how complex the concept of engagement is and that effects of drivers need to be assessed very carefully and from different angles to avoid jumping to misleading conclusions. Answering e.g., the question of whether social interaction is a driver of engagement or not, with a clear *yes* or *no* is not sufficient. Instead, the *when* and *how* needs to be considered in more detail to fully understand its effect. *Mixed methods research* in this context was shown to be one way to gain in depth insights on this complex topic. Hence, this thesis provides valuable insights and methodological learnings for researchers, especially dealing with complex psychological and social phenomena, such as in the field of human-computer interaction (HCI) and consumer behavior.

8.3 Managerial Implications

As it was mentioned in the introduction, many of the world's most valuable brands (e.g. Coca-Cola, HP, Ford) increased the number of crowdsourcing initiatives by over 30 percent on average (Roth et al., 2016). However, looking at the actual success rates of 23,809 crowdsourcers, studies show that around 90 percent of them fail to engage contributors, meaning that they receive less than 30 responses per year (Dahlander & Piezunka, 2014). Nevertheless, even if a firm manages to win a large crowd, participation inequality, referred to the 90:10:1 principle, is a very common phenomenon, meaning that 90 percent of participants are mostly passive, 9 percent show mediocre engagement, and only 1 percent show top participation (McConnell & Huba, 2007; Nonnecke & Preece, 2000).

Thus, while crowdsourcing is heading towards mainstream, the practice is still new and knowledge with regard to what fosters active and lasting engagement among contributors, as the underlying foundation of crowdsourcing success, is limited. Therefore, based on the rich insights from the studies conducted in the context of this thesis, a good-practice approach for fostering initial and lasting engagement among crowdsourcers with the overall goal of increasing mutual value creation is presented here.

Eight Steps for Managing Crowdsourcing Engagement Strategically

Figure 33 illustrates an eight-step guide for managing *crowdsourcing engagement* strategically throughout the three phases of *planning*, *managing* and *measuring* is presented here.

Plan	Manage	Measure
Engagement goal a) Participation engagement b) Post participation engagement	Social interaction a) Crowd-to-crowd (C2C) b) Initiator-to-crowd (I2C)	Psychological engagement a) Affective Commitment b) Calculative Commitment
Incentives a) Monetary incentive d) Non-Monetary incentive	Initial motivation a) Communicate the incentive b) Crowd-Task fit	
Platform management a) Self-management b) Intermediary	Risk a) Own "game changers" and "value adders" b) Outsource "risk factors"	Behavioral engagement a) Short-term effort shift b) Total number of activities in the long term

Figure 33. Eight Steps for Managing Crowdsourcing Engagement Strategically

Source: Own Illustration

Plan: ‘Setting the stage’

In the initial phase, the project foundation is set by assessing and defining the project-needs regarding the engagement goal(s), the crowd incentives, and the management choice for the crowdsourcing platform.

- First, project owners need to decide, if they want to foster *participation engagement*, *post-participation engagement*, or *both*. While the former one translates into higher platform activity during the project phase, which is relevant for problem-solution oriented projects; the latter one refers to a loyal crowd that continues engagement with the crowdsourcer and its offerings, after project-end. Decisive factors relate to a) the *type of crowd* that is needed (e.g., end-user vs. expert crowd), b) the *relevance of the task* (e.g., strategic vs. tactical) and *crowd’s contributions* for the crowdsourcer’s success (e.g., quality vs. quantity), and c) the *repetition need* for the initiative with the same crowd (e.g., retention goal vs. one time involvement).
- Second, project owners need to decide between *monetary* or *non-monetary rewards* for the crowd. Decision criteria imply a) the assumed *crowd motivation* (e.g., intrinsic motivation due to personal relevance of project vs. other incentives needed to extrinsically motivate participation), b) available *budget and permissions* (e.g., monetary resources provided and allowed to give to crowd vs. limited budget and/or restrictions for providing monetary rewards), and c) the *urgency* of the project set up and execution (e.g., quick submissions desired vs. patience).
- Lastly, project owners need to decide between incorporating a *crowdsourcing intermediary* (and the level of service desired) or self-managing the platform and crowd. Here, dominant factors comprise a) the *access to an appropriate crowd* (e.g., own crowd that can be approached vs. dependency on external crowd), b) existing *technical resources* and constraints (e.g., crowdsourcing platform, time, human resources for monitoring and managing), as well as c) necessary *skills and experiences* with managing such a project (e.g., platform maintenance, crowd management).

Manage engagement drivers and risk factors

In the second phase, the overall crowdsourcing journey and relevant touchpoints need to be managed strategically, based on the decisions made in phase one. Therefore, key drivers like social platform interaction, initial contribution motivation, and potential *risk factors* need to be understood and governed with great care.

- First, managing *social interactions* imply decisions on how to collaborate with the crowd from a crowdsourcer perspective as well as on how to foster interaction among crowdsourcees, if desired. Research showed that *initiator-to-crowd interaction (I2C)* triggers especially affective commitment towards the initiator, with the consequence that crowdsourcees tend to support and promote the crowdsourcer even beyond project boundaries. In contrast, *crowd-to-crowd*

interaction (C2C) triggers more rational commitment states related to the project and task itself, which fosters platform activity during the participation phase. Hence, depending on the engagement goal set in phase one, crowdsourcers, whose goal is to build stronger relationships with end-users and to foster post-participation engagement should trigger I2C-interaction, e.g. by using platform moderators. For those, whose goal is to increase crowd participation and general contribution quantity should trigger C2C-interaction, e.g. by implementing platforms with open discussion boards, voting mechanisms and public participant profiles.

- Second, proactively managing the *contribution motivation* implies the development of a holistic end-to-end experience strategy, depending on the chosen crowd-incentive structure from phase one. As research showed, promised *monetary incentives* in the pre-participation phase set expectations regarding the *crowdsourcing experience* low and avoiding dissatisfaction with *risk factors* and ensuring satisfaction with *game changers* may be already sufficient to build at least rational commitment. In contrast, in order to sustain and enhance engagement formation in initiatives *without monetary incentives*, over-fulfillment of expectations with *game changers* and arousing an extra portion of delight by creating *value adders* is necessary. For example, responsive and cheering moderators during the participation phase, a fun-providing and relevant task, a closing communication that confirms the crowd's overall impact on the final solution as well as picking an interesting and relevant object that is in the center of the task and project should be considered.
- Third, managing *risk* implies either taking special care of all the critical touchpoints that are *owned and managed by the crowdsourcer* (as perceived by the crowd) or strategically *outsourcing parts of the touchpoints to an intermediary*. In the latter set up, when incorporating a crowdsourcing intermediary, it is important to communicate clearly to the crowd what is not in full control of the crowdsourcer, especially if touchpoints relate to *risk factors*. For example, when using an intermediary's crowdsourcing platform, onboarding, registration and payment process, the intermediary's brand, design and name should be incorporated and clearly visible. Only then, dissatisfaction with one of the critical touchpoints can be absorbed by the intermediary and the chance of still fostering engagement formation towards the project and crowdsourcer is maintained (as long as touchpoints under the control of the crowdsourcer are managed successfully). In the case of full ownership of all the touchpoints along the crowdsourcing journey, dissatisfaction with *risk factors* should be strictly avoided.

Measure and track engagement throughout the process

Lastly, the effect of the *crowdsourcing experience* on *engagement formation* throughout the *crowdsourcing journey* needs to be measured and tracked to identify weaknesses and opportunities for improvement. As elaborated in the theoretical background section on

crowd engagement, psychological and behavioral engagement indicators can be measured, by sending out short surveys (or interviewing a diverse sample) and assessing log-data.

- First, *satisfaction responses* based on an arousal continuum reaching from not-aroused (neutral state) to several levels of positively and negatively aroused, related to critical touchpoints (at least *risk factors* and *game changers*) should be collected. Depending on the resources and strategic relevance of the project, this can be done more or less intensively. To avoid a recall bias, surveys and interviews asking about the satisfaction with a specific touchpoint should follow shortly after the experience (1-2 weeks later). For example, surveying the crowd a) after registration, b) after submitting a contribution and c) at the end of the project, allows to cover touchpoint experiences along the journey and reduces the effort for the crowd at one point in time.
- Second, *commitment states* of a more affective nature towards the *crowdsourcer* or a more rational nature towards the *project/task* should be measured, ideally once a) during the participation phase (to have a chance to improve something before the project) and b) at the end of the project, in the post-participation phase (to better understand project success and predict future intentions). While affective states speak for a stronger and more lasting commitment that is often desired, when crowdsourcing with actual or potential end-users; rational states are rather project dependent and may be sufficient when crowdsourcing with task-related experts.
- Third, *platform activities* with regard to the overall *quantity*, *diversity* and *type* (high vs. low effort) can be tracked constantly throughout the project and specifically, e.g. after platform changes or social interaction took place. As research showed, not just an increase in overall platform activity is an indicator of engagement formation, but also a shift from low- to high-effort activities, at least in the short term.

The overall goal is to increase both forms of commitment and platform activity. A healthy project has a mix of passive, but psychologically committed participants, and actively contributing participants, with a slight skew to the one or the other side depending on the initiative's original engagement objective (set in phase one). If a project has an undesired mix of engaged participants, going back to phase one and two and assessing current engagement objectives and related management actions is recommended.

8.4 Further Research

This thesis also indicates directions for further research. Some of these areas for further research arise from limitations, other directions arise due to the novelty of the two research fields of crowdsourcing and engagement.

Research Opportunity 1 – Increase the data base and extend methods to validate propositions

RQ: What determines an engaging crowdsourcing experience?

Propositions, made in this thesis were formulated in a way that they are generalizable to other crowdsourcing contexts and to apply them to different types of projects and set-ups. Yet, insights need to be treated with care and are suggested to be further explored and validated with additional data. Empirical observations are based on in depth data from four common crowdsourcing cases, including 30 interviews with crowdsourcees and log-data from 11,408 participants, as well as expert interviews and focus group discussions with members of eight crowdsourcing organizations, four intermediaries and several crowdsourcing experts from the *Crowdsourcing Consortium*. While this is sufficient for an initial phenomenon exploration and proposition development and model refinement as it was conducted in this thesis, it is not sufficient to prove causal relationships (Yin, 2013). Hence, for future research, it is suggested to:

- Extend the number of cases and replicate studies with a more diverse set of crowdsourcing projects, e.g., from different industries and with different types of service offers in the center of the task and crowdsourcees from different countries.
- Apply advanced quantitative methods to test effects that are proposed in the original research model (Figure 4) and validate relationships in the extended versions of the models (Figure 15, Figure 25, and Figure 30). For that purpose large n survey data related to stimuli experiences and engagement outcomes is suggested to be collected and a structural equation model calculated.
- Conduct more deep dive studies on the role of stimuli (especially those that were identified as *game changers*) and other project-related context factors for engagement formation, e.g., on the role of the *crowdsourcing task* (and type of tasks), *object of interest* that is in the center of the task, or even the type of industry that the crowdsourcer belongs to.
- Explore the role of past-experiences (e.g., how familiar someone is with the crowdsourcer and the activity of crowdsourcing) of crowdsourcee. This study tried to control for the factor by interviewing only participants who, had some prior experience with crowdsourcing and who named themselves as consumers of the crowdsourcer.

Research Opportunity 2 – Apply a design-science research approach to evaluate and further develop the crowdsourcing engagement management model and guidelines

RQ: How can crowdsourcing be effectively managed with goal of driving strategically engagement among crowdsourcees?

In the previous chapter, dealing with the managerial implications of this thesis, a good-practice approach for fostering initial and lasting engagement among crowdsourcees with the overall goal of increasing mutual value creation is presented. The management framework and guidelines are based on the findings of the conceptual and empirical work, presented in this thesis. In a next step, this management framework could be part of a design science research project (DSR) for evaluating iterating on its usability and effectiveness for crowdsourcees.

DSR is an approach that aims at delivering results which are of scientific rigor and of practical relevance at the same time, by providing innovative solutions to relevant problems that are grounded in empirical data and evaluated in iterative steps to proof its predicted effectiveness (Hevner, March, Park, & Ram, 2004; Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007). While this dissertation is not following the design science research process as empirically defining and exploring engagement processes in the context of crowdsourcing was in the center of this work, it still offers a good foundation by providing an early version of an artifact, grounded in theory and data.

DSR follows typically three cycles: 1) the relevance cycle that defines the application domain, problems and requirements from the user perspective for the artifact, 2) rigor cycle that provides the knowledge base for the artifact creation, based on scientific theories and experiences and the 3) design cycle, in which the artifact is build and evaluated. This thesis defined the problem space, together with consortium partners and created the knowledge base. In a next step, the evaluation of the here provided artifact could be conducted. Therefore, e.g., the framework for evaluation in DSR can be used to identify the right evaluation method (Venable, Pries-Heje, & Baskerville, 2016).

Research Opportunity 3 – Assess the potential role of chat bots as a substitute of human interaction for engagement formation

RQ: Can chat bots substitute human interaction with crowdsourcees?

One of the key findings of this thesis is that social interaction plays an important role for engagement formation throughout the crowdsourcing journey. Especially initiator-to-crowd interaction was shown to be related to increased platform activity and affective commitment formation due to the perceived benefits of social and personal recognition by the crowd. Hence, from practical point of view one conclusion is to increase crowdsourcee activities with crowd-members on the platforms. One way to operationalize this is by using platform moderators, who observe crowdsourcees' activities and get involved when an opportunity arises. In order to increase reach, some crowdsourcees also name very active crowd-members to transform into moderators and act as assistants.

Nevertheless, when thinking about the potential growth of crowdsourcing platform, e.g., in the case of Starbucks, where the *My Starbuck Idea* platform reached 100.000 submissions, interacting with crowdsourcees is an enormous effort.

Therefore the question arises, in how far crowdsourcer-to-crowd interaction can be automated with the help of chat bots that are trained to react to crowdsourcee's contributions and whether the effect would be the same. This thesis delivered valuable insights on why crowdsourcer-interaction is important, which can be used to design automated responses that stimulate perceived benefits. Nevertheless, when researching the effect of chat bots on *crowdsourcing engagement formation*, other related research questions may come up, like what makes human interaction "human" and how can it be imitated effectively?.

Research Opportunity 4 – Assess the role of gamification as a potential mechanical interaction for crowdsourcing engagement formation

RQ: What is the role of gamification for engagement formation within the crowdsourcing journey?

Closely related to research opportunity three, another opportunity to increase perceived platform interactivity for crowdsourcees is by implementing gamification elements. Gamification features, such as badges or rewards that can be won based on the activities and performance of a crowdsourcee, can be defined as a form of mechanical interaction.

Although this thesis argued that mechanical interaction arouses lower levels of emotions due to its predictive behavior and findings from one of the cases, applying gamification as an alternative reward for crowdsourcees, showed that it rather led to neutral states, it may be still worth to conduct a more in depth study.

In this case, a more in depth literature review regarding the different types of gamification features in crowdsourcing and an empirical assessment is recommended. Due to the technical and traceable character, log data analysis from a project that provides gamification elements would be ideal to measure stimulus-response effects. The method for log-data analytics suggested in this thesis can serve as a guidance (i.e., assessing response patterns that follow e.g., badge-provision).

Research Opportunity 5 – Assess response types and the content of social interactions to better differentiate effects

RQ: What type of social interaction is driving engagement?

This thesis provided insights on how social interaction in form of crowd-to-crowd and initiator-to-crowd affects engagement formation. While both forms were found to have a positive impact on behavior and I2C was even observed to foster affective commitment, no recommendation regarding the type and content of interaction-related communication can be provided.

Therefore, in a next step, content assessment is recommended to get a better understanding of the type of social interaction that drives engagement. This could be done by e.g., first applying sentiment analysis for clustering text-responses of crowdsourcers into different categories, and then mapping those categories with crowdsourcers' response behavior that followed the interaction to identify more or less effective interactions.

Research Opportunity 6 – Define a crowdsourcing engagement index to measure engagement more efficiently and effectively

RQ: How can crowdsourcing engagement be measured efficiently and effectively?

This thesis applied two relatively time-intensive research methods for exploring engagement effects within the crowdsourcing context: the *Sequential Incident Laddering Technique* for interviewing crowdsourcers and *log-data analytics that was conducted with individual types of behavioral responses* that were identified as indicators of engagement. While especially interview data can be very rich and meaningful, it takes a long time to collect, transcribe, code and assess this form of data. Similarly, calculating multiple regression models for individual behavioral response types is time intensive and leaves lots of room for interpretation.

In order to further develop the concept of engagement, a more efficient and at least equally effective engagement measure should be developed. This would be of benefit for the academic world in order to increase research opportunities, as well as the practitioner world for enabling crowdsourcers to easily assess *crowdsourcing engagement* within their own projects.

There are two opportunities. On the one hand, a survey instrument for measuring engagement states and behavioral intentions can be developed for that purpose. On the other hand, an engagement index based on platform activities can be developed. This thesis provides already valuable insights for defining psychological and behavioral indicators. In addition sentiment and content analysis may be considered for identifying additional signs of engagement. In both cases, a weighted score needs to be defined in order to come up with an engagement index that provides insights regarding the overall level of engagement.

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Appendix

Curriculum Vitae

Julia Troll

Personal Information

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Education

04.2015 – 04.2020	University of St. Gallen (HSG), Switzerland PhD in Business Innovation
02.2012 - 01.2013	Maastricht University, Netherlands Master in International Business
08.2011 – 01.2012	Singapore Management University (SMU), Singapore Exchange Semester
09.2008 – 07.2012	Maastricht University, Netherlands Bachelor in International Business

Work Experience

Since 01.2018	UX Researcher at Google, Switzerland
04.2015 - 12.2017	Researcher at SAP SE, Switzerland
04.2015 - 12.2017	Research Associate at University of St.Gallen, Switzerland
02.2013 - 03.2015	Consultant at Detecon International GmbH, Germany
2009 - 2013	Internships in the Telecommunication and Consulting Sector