**Conceptualizing Crowdfunding –**
**Managing Disruptive Transformation in the Banking Industry**

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The President:

Prof. Dr. Bernhard Ehrenzeller

*for my boys Valentin und Jakob*

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## ABSTRACT

Crowdfunding, as a novel concept for financial intermediation, has gained considerable attention and momentum in recent years and is an impressive example of how new concepts affect established industries. Despite its perceived similarity to the traditional financial industry, crowdfunding's competitive edge is based on components that were previously not considered relevant to the industry. In addition, the roles of customers and suppliers are blurred and value is created in open ecosystems. The established theory of financial intermediation therefore does not adequately describe how the intermediation process in crowdfunding works. Furthermore, there is hardly any knowledge on the systematic design of crowdfunding service systems.

The dissertation therefore examines *how crowdfunding can be conceptualized to enable banks, for example, to exploit the advantages of crowdfunding*. Three complementary explorative research questions will be addressed. First, cluster analysis is used to investigate how crowdfunding operates financial intermediation and which classes of crowdfunding intermediaries exist. This will provide a general understanding of the functional overlaps between crowdfunding and traditional financial intermediation as well as the different forms of crowdfunding. Secondly, design science is used to investigate how crowdfunding service systems can be broken down into their modular components, thereby also providing insights into the functional inner workings of the components. And third, the findings of an action design research project will explore how an established financial service provider and a partner from the digital world can work together to design a crowdfunding service system.

This dissertation provides three main theoretical contributions. First, it is shown that the modularization of crowdfunding services enables the bundling of the capabilities of several partners in a crowdfunding service system. Secondly, crowdfunding is defined as a crowd-enabled form of financial intermediation, which is able to fulfil the transformation functions of traditional financial intermediaries by bundling a specific set of crowdfunding mechanisms. This leads to the identification of three generic archetypes of crowdfunding intermediaries. Thirdly, actionable design knowledge for the conception of crowdfunding service systems is presented.

## ZUSAMMENFASSUNG

Crowdfunding als neuartiges Konzept zur Finanzintermediation hat in den letzten Jahren grosse Aufmerksamkeit und Dynamik erlangt und ist ein beeindruckendes Beispiel dafür, wie sich neue Konzepte auf etablierte Industrien auswirken. Trotz der vermeintlichen Ähnlichkeit zur traditionellen Finanzindustrie basiert der Wettbewerbsvorteil von Crowdfunding auf Komponenten, die bisher für diese Branche nicht als relevant angesehen wurden. Zudem verschwimmt das Rollenverständnis von Kunden und Lieferanten und die Wertschöpfung erfolgt in offenen Ökosystemen. Die etablierte Finanzintermediationstheorie beschreibt daher nur unzureichend, wie der Intermediationsprozess im Crowdfunding funktioniert. Darüber hinaus gibt es bisher kaum Wissen zur systematischen Gestaltung von Crowdfunding-Service-Systemen.

Die Dissertation untersucht daher, *wie sich Crowdfunding konzeptualisiert lässt, um es z.B. Banken zu ermöglichen, die Vorteile von Crowdfunding für sich nutzbar zu machen*. Hierzu werden drei komplementäre explorative Forschungsfragen behandelt. Zunächst wird mittels Cluster-Analyse untersucht, wie Crowdfunding Finanzintermediation betreibt und welche Klassen von Crowdfunding-Intermediären existieren. Hierdurch wird ein allgemeines Verständnis über die funktionalen Überschneidungen von Crowdfunding und traditioneller Finanzintermediation sowie die verschiedenartigen Ausprägungsformen von Crowdfunding geschaffen. Zweitens wird mittels Design Science untersucht, wie sich Crowdfunding-Service-Systeme in ihre modularen Bestandteile zerlegen lassen, wodurch auch Einblicke in das funktionale Innenleben der Komponenten ermöglicht werden. Und drittens, wird durch die Erkenntnisse eines Action-Design-Research-Projekts der Frage nachgegangen, wie sich durch die Zusammenarbeit eines etablierten Finanzdienstleisters und eines Partners aus der digitalen Welt ein Crowdfunding-Service-System entwerfen lässt.

Diese Dissertation liefert drei theoretische Hauptbeiträge. Zunächst wird gezeigt, dass die Modularisierung von Crowdfunding-Services die Bündelung der Fähigkeiten mehrerer Partner in einem Crowdfunding-Service-System ermöglicht. Zweitens wird Crowdfunding als eine durch die Crowd ermöglichte Form der Finanzintermediation definiert, die durch die Bündelung bestimmter Crowdfunding-Mechanismen in der Lage ist, die Transformationsfunktionen traditioneller Finanzintermediäre zu erfüllen. Dies führt zur Identifizierung von drei generischen Archetypen von Crowdfunding-Intermediären. Drittens werden konkrete Gestaltungshinweise zur Konzeption von Crowdfunding-Service-Systemen präsentiert.

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# 1. INTRODUCTION

## MOTIVATION

The Internet and new digital technologies resulted new business approaches, which have affected, threatened, and radically changed many traditional industries. These emerging business innovations deeply impacted today's society and individuals. Against this backdrop, incumbents in traditional industries often struggle to keep up with the pace of these start-ups and to adapt to changing customer requirements (Christensen 1997; Christensen and Overdorf 2000). Partially well-funded by millions of venture capital and equipped with a vision to change the world, this new class of competitors frequently moves faster and more flexible than incumbents. Therefore, they rapidly and inexorable conquer existing and newly developing market segments and offer complementary and substitutional services by relying on their speed, flexibility, and customer centricity.

This is particularly the case in the financial service industry, where a plethora of innovative fintech newcomers disrupted and reshaped the landscape. While many banks lack a sense for innovation (Gartner 2010), a magnitude of fast growing fintech newcomers and lateral entrants with an ICT background offer complementary and substitutional products for traditional banking services. Facilitated by the banking crisis, these fintech companies increasingly call traditional banks into question (Welfens 2010), pushing banks to actively engage with these emerging opportunities (Beck 2010; Liebenau et al. 2014). Impressive and well-known examples include novel online or mobile payment services like *e.g., PayPal, Apple Pay, Twint* and crowdfunding as a novel concept of funding and investing (e.g., *Lending Club*[1]). Especially crowdfunding gained large attention and momentum over the last few years (Dushnitsky et al. 2016) and is an impressive example for the change of the financial industry.

Crowdfunding can be described as collective funding by an undefined group of capital givers, where capital seekers and the crowd of capital givers are directly interlinked via an crowdfunding intermediary by means of an Internet-based open call (Belleflamme et al. 2014). Crowdfunding is frequently considered a more transparent, easy, entertaining, and democratic way of funding in contrast to banks (Bretschneider et al. 2014; Schulz et al. 2015). It may span highly different purposes that range from

[1] www.lendingclub.com

collecting donations for social projects, (pre-) selling products (Belleflamme et al. 2014; Bradford 2012), to funding start-ups in exchange for profit shares and/or interests (Bradford 2012). Thus, a variety of highly specialized and diverse crowdfunding intermediaries emerged in order to serve these complementing or substituting markets of the financial service industry.

Despite the proximity to the traditional financial service industry, the competitive edge of crowdfunding is based on components, which have not been considered relevant for the financial service industry so far, such as crowd management (Liebenau et al. 2014). In crowdfunding the roles of customers and suppliers are blurred and value is created in open ecosystems. (Rong and Shi 2014; Williamson and De Meyer 2012). The established theory of financial intermediation (Allen and Santomero 1998; Diamond 1984) therefore does not adequately describe how the intermediation process in crowdfunding works and which generic classes of crowdfunding intermediaries can be differentiated.

Besides, these new competitors are digital and *"analytical [...] from birth"* (Davenport 2014), as their business models and core competencies frequently include advanced data analytics such as analytics-driven risk scoring. By building on grown legacy systems, incumbents such as banks are almost unable to copy these approaches due to issues of speed and flexibility. Nevertheless, banks today already have competences which are necessary to offer crowdfunding systems, e.g., account management, payment, and ensuring legal requirements. Traditional financial intermediaries as well as crowdfunding intermediaries aim at reducing transaction costs and information asymmetries (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). However, research has so far largely neglected what the constituting components of crowdfunding are and how they are bundled in order to provide a consistent service provision.

The banks most pivotal assets and competitive advantage over the crowdfunding newcomers are the huge customer bases, which are based on long-standing relationships, trust and reliability. Therefore, the bundling of own competences with startups and other service providers in service systems represents a straightforward solution for overcoming the organizational and operative shortcomings and leverage on mutual strengths. Despite the potential benefits of bundling competences within a service system in order to exploit various highly attractive niche markets, which couldn't be served by current products, no guidance for incumbents of how to engage

with a partner from the digital world in order to design crowdfunding service systems exist (Böhmann et al. 2014).

The dissertation therefore examines *how crowdfunding can be conceptualized to enable banks, for example, to exploit the advantages of crowdfunding*. Three complementary explorative research questions will be addressed. First, the question of how crowdfunding operates financial intermediation and which classes of crowdfunding intermediaries exist is investigated. This will provide a general understanding of the functional overlaps between crowdfunding and traditional financial intermediation as well as the different forms of crowdfunding. Secondly, this thesis investigates how crowdfunding service systems can be broken down into their modular components, thereby also providing insights into the functional inner workings of the components. And third, this thesis explores how an established financial service provider and a partner from the digital world can work together to design a crowdfunding service system.

## RESEARCH QUESTIONS

In order to investigate "*how crowdfunding can be conceptualized in order to enable banks to leverage on the benefits of crowdfunding"*, this cumulative dissertation follows three complementary explorative research questions. The research questions are structured and formulated in order to inform the subsequent research questions as well as to provide stand-alone contributions. Therefore, each research question is covered by one to three publications.

### RQ1: How is crowdfunding performing financial intermediation?

Crowdfunding intermediaries still serve the same purpose such as incumbent financial intermediaries, which is to create thick markets between capital seekers and capital givers. Therefore, they exhibit three fundamental differences. First, funding decisions are democratized by opening up to every individual with Internet access and the required financial capability (Belleflamme et al. 2014). Second, they provide liquidity to former illiquid markets (due to size, risks, and profitability) by making use of sophisticated information technology (Liebenau et al. 2014; Schwienbacher and Larralde 2012). Third, crowdfunding intermediaries are not involved in the actual funding process but serve as matchmaker for peer-to-peer relationships between capital seekers and givers, for which they provide the technical or organizational infrastructure on an online platform (Liebenau et al. 2014).

These differences exhibit some degree of disintermediation of the actual funding process by directly linking capital seekers and givers. In crowdfunding, however, intermediaries still seem to be essential because of transaction costs and information asymmetries (Bakos 1991; Bakos 1998; Mahadevan 2000). For instance, collecting micropayments from capital givers can reflect an arduous task. Similarly, new approaches for evaluating and controlling "default risks" of long tail projects may be required, particularly when capital seekers may hide or manipulate important information (Ahlers et al. 2015; Burtch et al. 2016). Consequently, crowdfunding intermediaries evolved as new class of financial intermediaries that have reshaped the way financial intermediation is performed in order to address such specific challenges. However, existing financial intermediation theory (Allen and Santomero 1998; Diamond 1984) falls short in explaining how crowdfunding intermediaries perform financial intermediation due to the high degree of digitization, the systemic value co-creation, the changed role of the intermediary, and the creation of long tail offerings. Following this line of reasoning, the diversity of crowdfunding intermediaries suggests that different types of crowdfunding may reflect different instantiations of financial intermediation. However, research and practice offer a plethora of different conceptualizations of the phenomenon, which hampers our understanding of *how crowdfunding intermediaries perform financial intermediation*.

**RQ2: How can crowdfunding service systems be decomposed?**

While RQ1 highlights the systemic and modular functioning in order to perform financial intermediation, the actual constituting components and respective interrelations remain rather blurry.

Despite the huge growth of the crowdfunding market in terms of origination volume and platform numbers, this growth is not distributed equally among all types of crowdfunding. While the market for crowdlending is booming, the market for crowdinvesting is stagnating. Further, the market in general is characterized by a large fluctuation and shows the tendency of consolidation (Blohm et al. 2015; Michels and Hoffmann 2016). As crowdfunding comprises a complex combination of services and stakeholders, and includes components, which have not been considered relevant for the banking industry so far, the design of such service systems represents a tough challenge (Liebenau et al. 2014).

Thus, many attempts to design new crowdfunding service systems struggle, as the complexity of the crowdfunding service system can't be overseen and they lack an

understanding for the structure and their inner workings. In order to overcome this complexity, the decomposition of the crowdfunding service system into single components is necessary. This approach is known from the concept of service modularization (Böhmann and Krcmar 2006a; Böhmann et al. 2014). Especially, during early stages of the development of crowdfunding services and the assessment of design choices, guidance is needed.

The complex systemic structure of crowdfunding, which allows the bundling and aggregation of various competences, stakeholder and roles has been addressed by certain researchers before (Hemer 2011; Liebenau et al. 2014; O'Sullivan et al. 2002). Further, certain organizational and conceptual insights are provided by reporting on the developing, piloting, and evaluation of a crowdfunding service system (Wieck et al. 2013) or the conceptualization of an investment model (Tomczak and Brem 2013). By taking attempts to systemize crowdfunding, certain researchers provide isolated insights on single components such as the type of compensation capital givers receive for their investment (Belleflamme et al. 2014; Bradford 2012).

However, current research does neither take a systematic approach to comprehensively identify the constituting modular components of a crowdfunding service system nor does it provide an understanding about the component's inner workings. Thus the second research question investigates *how crowdfunding service systems can be decomposed*.

**RQ3: How to systematically design crowdfunding service systems?**

While RQ1 and RQ2 focus on disclosing the former black box "crowdfunding intermediation", by taking a functional perspective in order to investigate their ability to perform financial intermediation and by taking an organizational perspective in order to identify their constituting components and respective inner workings, RQ3 focuses on the actual design of a crowdfunding service system by a bank.

As outlined before, the competitive edge of crowdfunding is based on components, which have not been considered relevant for the financial service industry so far (Liebenau et al. 2014). Besides novel components such as crowd management, crowdfunding intermediaries frequently include advanced data analytics such as analytics-driven risk scoring. By building on grown legacy systems and their lack of expertise, incumbents such as banks are almost unable to copy innovative approaches due to issues of speed and flexibility. Nevertheless, banks today already have competences which are necessary to offer crowdlending systems, e.g., account

management, payment, and ensuring legal requirements. Besides, the banks most pivotal assets and competitive advantage over the crowdlending newcomers are the huge customer bases, which are based on long-standing relationships, trust and reliability. Therefore, bundling competences with startups and other service providers in service systems represents a straightforward solution for overcoming the organizational and operative shortcomings and leverage on mutual strengths.

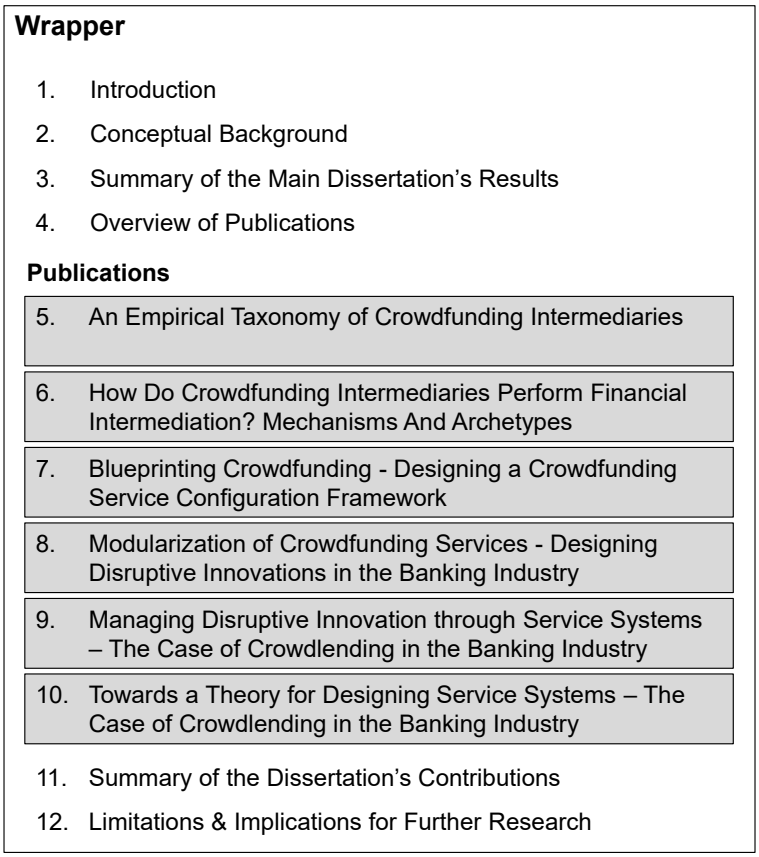
Service systems can be defined as *"configurations of people, information, organizations, and technologies that operate together for mutual benefit"* (Maglio et al. 2015). This allows the provision of certain services by the incumbents themselves, whereas they may source others from specialized partners within the service system. This enables incumbents to keep up with the pace of start-ups while leveraging their own strengths and enables the startup to benefit from the incumbent's grown customer base, financial resources and reputation (Christensen and Raynor 2013). Despite the relevance of the service system perspective for the development of crowdfunding service systems, current research has not described how to systematically design them. In order to leverage efficient service development in such interconnected systems, the design of tools and methods for their systematic engineering is substantial (Böhmann et al. 2014). Although the modular structure in service science has been studied for many years and a system's and platform's perspective has been considered relevant (Tuunanen and Cassab 2011), the design of modular service systems can be considered highly relevant, but understudied (Yoo et al. 2012). First attempts for the systematic design of service systems exist (Teixeira et al. 2016), and even impacts on such design for the financial sector, have been examined (Ding et al. 2010), but current literature does not provide explanations regarding the design of modular service systems such as crowdfunding where the experience of incumbents and the innovative and agile character of startups are key to success and need to be combined. Therefore, the third research question is formulated as *how to systematically design crowdfunding service systems*.

## THE COURSE OF THE THESIS

This thesis is structured as follows: Following this introduction, the next chapter elaborates the research questions in more detail. In chapter two, the conceptual backgrounds regarding crowdfunding fundamentals, crowdfunding intermediaries and intermediation, and crowdfunding service systems are discussed. Within the third chapter, the thesis's major results are presented, followed by an overview over the

publications included in this thesis in chapter four. Afterwards, the chapters five to ten, include the comprising six publications of this dissertation. In chapter eleven, the dissertation's theoretical and practical contributions are discussed. Within the chapter twelve the thesis's limitations and resulting implications for further research are elaborated. Figure 1provides an overview over the dissertation's overall structure.

***Figure 1: Dissertation's Overall Structure***



# 2. CONCEPTUAL BACKGROUND

## CROWDFUNDING FUNDAMENTALS

Crowdfunding describes the collective funding by an undefined crowd, where capital seekers (i.e., initiators of crowdfunding projects such as artists, entrepreneurs, etc.) and a crowd of capital givers are directly interlinked via an online crowdfunding intermediary by means of an Internet-based open call (Belleflamme et al. 2014). Capital givers receive a compensation for their investment, which ranges from altruistic rewards, non-monetary rewards, to forms of monetary compensation (e.g., interest or profit share) (Bradford 2012). Crowdfunding intermediaries provide an online platform as the point of interaction between capital givers and seekers, a regulatory framework (e.g., standardized contracts) (Bradford 2012), and additional supporting services (e.g., debt collection) (Liebenau et al. 2014). Thus, crowdfunding emerged from the paradigm of crowdsourcing, which describes the outsourcing of various tasks to an undefined crowd by an Internet-based open call (Blohm et al. 2013a; Estellés-Arolas and González-Ladrón-de-Guevara 2012; Leimeister 2012). Following this thought in crowdfunding the task of funding is outsourced to the crowd of capital givers (Moritz and Block 2014). Thus, funding activities are no longer restricted to financial institutions such as banks, venture capitalists or business angels but opened up to the public, such that anybody can participate according to their individual financial and mental capabilities. Thus, the roles of customers and suppliers become blurry (Rong and Shi 2014; Williamson and De Meyer 2012), while on the other hand network effects became crucial (Belleflamme et al. 2018).

Although the concept of collective financing is not new, the Internet has paved the way for the scaling development of the phenomenon (Belleflamme et al. 2013). A frequently cited former times example of crowdfunding is the pedestal of the Statue of Liberty in 1885. In order to collect funding, Joseph Pulitzer's asked the citizens of New York to contribute to the funding of the pedestal via his newspaper *The World.* In return, the capital givers' names have been published in an issue of the newspaper. The campaign was extremely successful, as in particular small donations of under USD 1 made up to for 80% of the grand total (Harris 1985). A more recent example is Barack Obama's 2008 presidential campaign, where ca. USD 350 Mio. have been collected through a crowdfunding campaign with donations of less than USD 200 (Kappel 2009). Further success stories of crowdfunding campaigns comprise e.g., the funding of the German movie *Stromberg*, or the portable cooling device *Coolest Cooler*. These

examples caused large attention and indicate the huge potential of crowdfunding, which resulted in the emergence of a plethora of new crowdfunding providers and the maturation of crowdfunding as alternative form of funding (Blohm et al. 2015; Dushnitsky et al. 2016; Massolution.com 2015).

Since 2007 crowdfunding is gaining attention in research as well. Most existing crowdfunding research has focused on capital seekers and givers. Research investigated behavioral decision-making patterns of capital givers and seekers, e.g., herding or signaling effects (Agrawal et al. 2010; Berns et al. 2018; Burtch et al. 2013b; Hornuf and Schwienbacher 2018), their motivation (Gerber et al. 2012), beneficial characteristics (e.g., race) (Lin et al. 2014; Wang and Greiner 2011; Younkin and Kuppuswamy 2017), or their roles and activities within crowdfunding projects (Hui et al. 2013; Ordanini et al. 2011). The second main stream of research focuses on crowdfunding projects, e.g., factors that influence the funding success including social and personal networks (Lin et al. 2013), project presentation (Mitra and Gilbert 2014b), the offered incentives (Hildebrand et al. 2017), or the dynamics of crowdfunding projects (Mollick 2014; Schwienbacher and Larralde 2012). Additionally, certain authors investigated risks associated with crowdfunding (Burtch et al. 2016; Siering et al. 2016) or fraudulent behavior (Cumming et al. 2016; Siering et al. 2016). Further, researchers tried to investigate the benefits of crowdfunding for gaining market insights and engaging the crowd in the product development process (Chemla and Tinn 2018; Viotto da Cruz 2018).

## CROWDFUNDING INTERMEDIARIES

In order to serve the highly differentiated markets, multiple highly specialized intermediaries emerged, which differentiate significantly with regard to functionality, complexity, and service provision. Following this logic, *"crowdfunding"* represents a generic umbrella term, comprising multiple highly specialized instantiations. Therefore, researching and dealing with crowdfunding requires a more precise distinction of the specific context and form. Therefore, some early research has focused on classifying crowdfunding intermediaries. These first attempts differentiated crowdfunding based on the *legal* relationship between capital givers and seekers (Bradford 2012), the *compensation* for capital givers (Belleflamme et al. 2014; European Commission 2014; Massolution 2013), their *motivation* (Collins and Pierrakis 2012; Hemer 2011), and additional *risk* factors (Beaulieu et al. 2015; Ordanini et al. 2011). Table 1 exhibits previous attempts of conceptualizing types of

crowdfunding intermediaries. However, these classifications are mostly conceptual in nature and are primarily based on the provided compensation. They are neither theoretically grounded, nor empirically validated.

***Table 1: Classifications of Crowdfunding Intermediaries***

| Author | Focus of Classification | Types of Crowdfunding | Theoretical Foundation & Empirical validation |
|---|---|---|---|
| Belleflamme et al (2014) | Community benefits that increase capital givers' utility | • Pre-Ordering<br>• Profit-Sharing | • Conceptual nature<br>• Theoretical unified model<br>• No empirical validation |
| Bradford (2012) | Legal Relationship based on the offered returns for capital givers | • Donating Model<br>• Reward Model<br>• Pre-Purchase Model<br>• Lending Model<br>• Equity Model | • Conceptual nature<br>• Federal Securities Law<br>• No empirical validation |
| Collins & Pierrakis (2012) | Forms of contributions, returns, and motivations | • Donation Crowdfunding<br>• Reward Crowdfunding<br>• Crowd-funded Lending<br>• Equity Crowd-funding | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| European Commission (2014) | Forms of returns | • Donations<br>• Reward-based<br>• Pre-Sales<br>• Crowdlending<br>• Crowdinvesting | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Hemer et al (2011) | Forms of returns and motivations | • Crowd Donations<br>• Crowd Sponsoring<br>• Crowd Pre-Selling<br>• Crowd Lending<br>• Crowd Equity | • Conceptual nature<br>• No theoretical foundation<br>• Systematic description of 200 crowdfunding platforms |
| Massolution (2013) | Forms of returns | • Donation-based<br>• Reward-based<br>• Lending-based<br>• Equity-based<br>• Royalty-based | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Ordanini et al. (2011) | Risk return ratio and type of consumer involvement | • Music business<br>• Financial services<br>• Context of personal and social services | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Beaulieu et al. (2015) | Exchange and risk factors | • Private equity<br>• Royalty<br>• Microfinance<br>• Peer-to-peer<br>• Rewards<br>• Donation | • Conceptual nature<br>• Grounded theory approach<br>• Content analysis of 99 campaigns with regard to 13 characteristics |

## CROWDFUNDING INTERMEDIATION

Crowdfunding takes place within a two-sided market, which aims at matching capital givers and capital seekers and creating thick markets (Wei and Lin ; Zvilichovsky et al. 2013). In crowdfunding capital givers and capital seekers enter a direct peer-to-peer relationship. Thus, this direct relationship reflects a disintermediation of the funding process, as no central institution is needed in order to provide the capital. However, due to prevalent transaction costs – e.g., by the collection of multiple micropayments and the micro repayments – and information asymmetries – e.g., due to the occurrence of information hiding, manipulation, and fraudulent behavior information (Ahlers et al. 2015; Burtch et al. 2016; Cumming et al. 2016; Siering et al. 2016) – intermediaries are still essential (Bakos 1991; Bakos 1998; Cumming and Zhang 2019; Lin 2015; Mahadevan 2000).

Thus, crowdfunding intermediaries evolved as new class of financial intermediaries that have reshaped the way financial intermediation is performed in order to address such specific challenges. Financial intermediaries are ubiquitous and essential institutions in imperfect markets, which are characterized by transaction costs (Benston and Smith 1976; Gurley and Shaw 1966) and information asymmetries (Fama 1980; Leland and Pyle 1977). Due to theory of financial intermediation, financial intermediaries transform lot sizes, risk, information, and maturities in order to enable successful mediation between capital givers and capital seekers and to overcome transaction costs and information asymmetries (Allen and Santomero 1998; Diamond 1984; Entrop et al. 2015; Fama 1980).

**Lot Size Transformation:** Financial intermediaries balance diverging capital requirements. Therefore, the deposits of capital givers are bundled in order to satisfy the capital requirements of capital seekers. Financial intermediaries act as matchmakers by serving capital givers and seekers on own account. In so doing, they provide pooling and payment mechanisms for the capital exchange in order to overcome the boundaries of time, geographies, and industries (Merton 1989).

**Risk Transformation:** Financial transactions contain risks and uncertainties. The expected return for an investment is directly linked to a certain risk expectation (Markowitz 1952). Thus, higher default risks result in higher return expectations. Financial intermediaries balance diverging risk expectations by managing, diversifying, and trading risks among capital seekers and givers. They may act as neutral, trustworthy, objective, and specialized partner for third parties that ensure

integrity, veracity, and legal compliance (Bakos 1998; Gorton and Winton 2003; Merton 1989). Due to their experience in assessing investments risks and corresponding monitoring activities, financial intermediaries are able to reduce risks associated with information asymmetries and avoid free riding behavior of capital givers (Diamond 1984; Gorton and Winton 2003).

**Information Transformation:** Participants in financial markets strive for a better level of information in order to make the "best" investment decisions. However, since only capital seekers possess information about the veracity of their intentions, financial intermediaries reduce information asymmetries by creating, bundling, and providing reliable information, e.g., regarding a capital seeker's creditworthiness (Gorton and Winton 2003; Leland and Pyle 1977; Merton 1989). Vice versa crowdfunding generates valid information about the market potentials for proposed projects (Viotto da Cruz 2018).

**Maturity Transformation:** Financial intermediaries balance different timeframes. This involves borrowing capital on longer timeframes than lending it out (Gambacorta and Mistrulli 2004). As interest rates differ between timeframes (i.e., they are higher for short-term loans than for long-term loans), financial intermediaries create profits and reduce transaction costs by synchronizing timeframes.

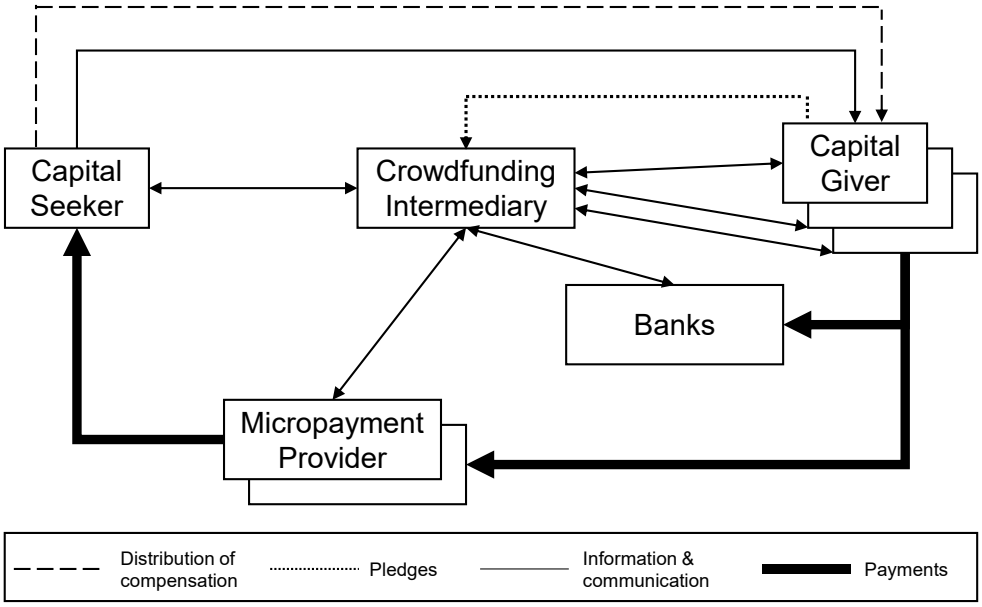
Due to the existence of transaction costs and information asymmetries, crowdfunding intermediation faces the same necessity for these transformation functions in order to ensure an efficient service provision (Haas and Blohm 2017). However, the traditional financial intermediation theory (Allen and Santomero 1998; Diamond 1984) falls short in explaining how crowdfunding intermediaries perform financial intermediation as it does not take into consideration (1) the high degree of digitization of the business operations; (2) the joint value co-creation in ecosystems; (3) the changed role of the financial intermediary as matchmaker that operates a multi-sided platform business; and (4) the creation of long tail offerings for niche markets.

## CROWDFUNDING SERVICE SYSTEMS

In order to enable these new class of financial intermediation, the crowdfunding service provision requires diverse competences, ranging from IT, banking, payment, to knowledge regarding crowd and operating a platform business. Therefore, multiple partners and their competences need to be bundled within complex service systems (Haas et al. 2015).

Service systems can be defined as *"configurations of people, information, organizations, and technologies that operate together for mutual benefit"* (Maglio et al. 2015). The systemic structure of crowdfunding intermediation has already been described by some early research about crowdfunding, which describes the crowdfunding service system by identifying the involved partners such as banks or payment providers and respective interactions (Hemer 2011; Liebenau et al. 2014). A generic illustration of a crowdfunding service system, involving multiple partners and various interactions is provided in Figure 2. In order to enhance this thought by a processual perspective, most notably, Tomczak and Brem (2013) conceptualized the crowdfunding investment process by applying process modelling techniques. However, the previous research reflects early thoughts, which do not provide a proper explanation of the structure and the inner workings of crowdfunding service systems.

***Figure 2: Crowdfunding Service System (Hemer 2011)***




In order to enable the bundling of multiple partners and competences towards a continuous service provision the crowdfunding service provision needs to be decomposed into its constituting components. This approach is known from the concept of service modularization (Böhmann and Krcmar 2006a; Böhmann et al. 2014b). Modularization rests upon the basic principles of cohesion and loose coupling (Balzert 1996), with cohesion referring to the intra-module cohesion of the module elements and loose coupling to the inter-module dependency between the individual modules (Peters and Leimeister 2013). Further, the modular structure of crowdfunding service systems enables banks to keep up with the pace of the fintech industry in developing innovations and innovative business models while also leveraging their

own strengths (Christensen and Raynor 2013). Additionally, typical modularization benefits, such as reuse (of specific modules in different service offerings focusing on different target groups), module-wide innovation (with a clear concentration on the disruptive, value-creating parts), rapid re-configuration (of existing service offerings by enabling additional/disabling abundant modules), and faster development of new service offerings (by using existing modules) can be achieved (Böhmann et al. 2008). This enables the crowdfunding service system's involved partners e.g., a bank to provide their modularized competences (e.g. account management) not only for one single crowdfunding service bundle, but complementary crowdfunding or fintech initiatives. Further, it enables the quick expansion of the crowdfunding service bundle to new markets by rapid and cost-effective re-configuration of the modules, which facilitates fast and scalable growth.

# 3. SUMMARY OF THE MAIN DISSERTATION RESULTS

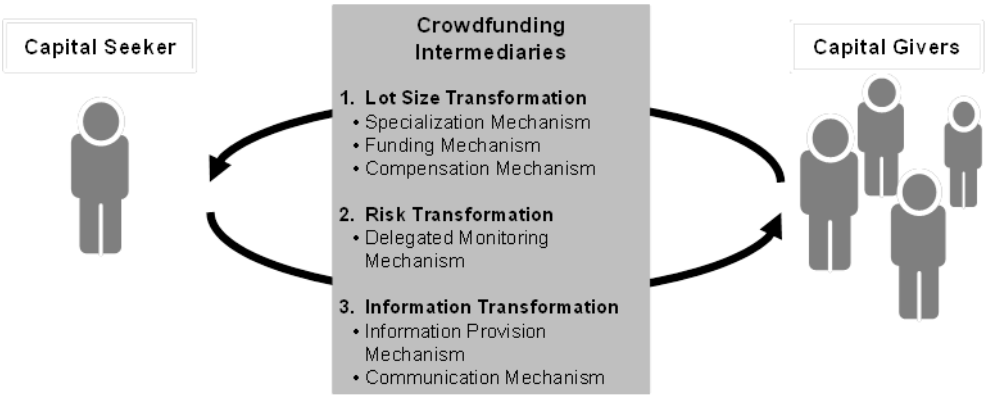
## CROWDFUNDING INTERMEDIATION THEORY & ARCHETYPES

### Theory Overview

The pioneering work of how crowdfunding is able to perform financial intermediation is the thesis's first major result. As due to the changed conditions (e.g., a crowd as capital givers, focus on niche markets, intermediary as platform provider) traditional theory of financial intermediation falls short in describing how crowdfunding intermediation is performed. Therefore, the thesis describes an explanative system theory of crowdfunding intermediation and discovers how crowdfunding intermediaries apply distinct organizational and technical mechanisms for performing financial intermediation. Following this argumentation, the thesis argues that the implementation of these mechanisms results in a system of crowdfunding intermediation, which determines the way of how crowdfunding intermediation is being performed. Thereby, the thesis follows a system perspective that describes exchange processes between the involved actors. A system theory proposes a paradigm of interacting parts resulting in a system, which represents an entity with its own properties (Boulding 1956; Burton-Jones et al. 2015; Mattessich 2012; Von Bertalanffy 1968). A system theory mainly focuses on giving explanatory insights by interrelating the mechanisms forming the overall system. They result in alternate understandings about *how* things occur, thus, suitable for exploring new phenomena (Salmon 1998).

Following the transformation functions of financial intermediation theory (Allen and Santomero 1998; Diamond 1984), crowdfunding intermediation is conceptualized as a system of mechanisms that have been chosen and implemented by a crowdfunding intermediary in order to offer a respective type of intermediation. These mechanisms are guiding the interactions between capital seekers and givers and set the infrastructural boundaries for the process of financial intermediation. Thus, the different transformation functions of financial intermediation theory are implemented at crowdfunding intermediaries by a set of context-specific mechanisms (see Figure 3).

*Figure 3: Crowdfunding Intermediation*




The thesis proposes six mechanisms that put these transformation functions into action and shape how crowdfunding intermediation takes place (see Table 2).

*Table 2: Mechanisms of Crowdfunding Intermediation*

| **Transformation Function** | **Underlying Mechanism** | **Instantiations** |
|---|---|---|
| Lot size Transformation | Specialization | • *Creative projects and creative products*<br>• *Start-ups and new businesses*<br>• *Private consumption*<br>• *Sustainability and social action* |
| | Funding | • *Investment levels*<br>• *Minimum Investments*<br>• *All-or-nothing- / keep-it-all-principle* |
| | Compensation | • *Altruistic experience*<br>• *Rewards*<br>• *Pre-ordered products*<br>• *Interests*<br>• *Profit shares* |
| Risk Transformation | Delegated Monitoring | • *Due diligence, creditworthiness checks*<br>• *Feasibility assessments* |
| Information Transformation | Information Providing | • *Description*<br>• *Videos* and *pictures*<br>• *Background information about capital seeker*<br>• *Funding history of capital giver* |
| | Communication | • *Communication function* |

**Archetypes**

The implementation of these mechanisms is subject to choice for the crowdfunding intermediary and may vary due its objectives. So far, the theoretical analysis has helped to unravel the central building blocks of crowdfunding intermediation, i.e., mechanisms of crowdfunding intermediation and their instantiations. The selective bundling of these mechanisms into a system of crowdfunding intermediation determines how financial intermediation is performed. Further, by conducting cluster analysis, three dominants configurations of the constituting crowdfunding intermediation mechanisms have been identified, which represent generic archetypes of crowdfunding intermediation.

***Archetype 1: Profit-Oriented Crowdfunding Intermediation***

The first archetype focuses on profit-oriented crowdfunding intermediation. With regard to lot size transformation this archetype mainly specializes on *start-ups and new businesses*. Also, the funding of *private consumption* can be assigned to this archetype. Profit-oriented crowdfunding intermediation predominantly implements financial compensations such as *profit shares* or *interests*. Funding mechanisms are designed in a rather moderate way. Therefore, most frequently, *minimum investments* are implemented in conjecture with the *all-or-nothing principle*. By contrast, *investment levels* are hardly implemented. Thus, this funding mechanism primarily gears at preventing a too complex co-owner structure of capital givers, while also taking care that capital seekers have the requested financial resources in order to satisfy the return expectations of capital givers. As sharing future financial returns embodies a considerable investment risks for capital givers, due to higher sums and the possibility of a total loss, both areas are subject to special legal regulation. Thus, risk transformation is crucial in profit-oriented crowdfunding intermediation. Rigid *due diligence checks* are implemented in order to evaluate default risks of projects. The same is true for information transformation. As participation of capital givers aims at generating profits, crowdfunding intermediaries provide comprehensive information helping capital givers to make investment decisions. Thus, textual *project descriptions* of the investment opportunity, *video and pictures* further improving the understanding of the project, as well as *background information about the capital seeker* and *funding histories of the capital givers* are usually implemented. Also, many crowdfunding

intermediaries offer *communication functions*. Typical examples for this archetype include *FundedByMe*[2] or *LendingClub*[3].

***Archetype 2: Philanthropic Crowdfunding Intermediation***

The second archetype performs a philanthropic form of crowdfunding intermediation, where capital givers predominantly support crowdfunding projects by donations. By supporting projects in philanthropic crowdfunding intermediation capital givers are provided with an *altruistic experience*. Thus, philanthropic crowdfunding intermediaries mostly specialize on *sustainability and social action*. Due to the nature of these projects and the absence of direct compensation, funding mechanisms are designed to be very relaxed by setting no entry hurdles in order to support the benevolent fundraising. Therefore, mostly the *keep-it-all-principle* is implemented such that capital seekers receive any collected sum no matter whether the intended funding threshold was reached. Consequently, *investment levels* are not implemented in order to avoid donation barriers. However, *minimum investments* are quite common as capital givers are encouraged to donate higher sums. Due to lower investment sums and the philanthropic orientation risk transformation plays a tangential role such that delegated monitoring mechanisms are implemented rather occasionally. However, information providing plays a crucial role in order to advert for the greater good. Therefore, especially comprehensive *project descriptions* as well as vivid *videos and images* are applied. *Background information about the capital seeker*, *funding histories of capital givers*, as well as a *communication function* are commonly implemented in order to encourage capital givers to invest higher sums and spread the word. An exemplary intermediary for applying philanthropic crowdfunding intermediation is *Crowdrise*[4].

***Archetype 3: Hedonistic Crowdfunding Intermediation***

The third archetype has a rather hedonistic character. Lot size transformation is primarily performed by specializing on *creative projects and products*, where capital givers mainly receive non-monetary *rewards* or *pre-ordered products* as compensation. Hedonistic crowdfunding intermediation encourages capital seekers to address capital givers' sense of interest, desire, or joy. In so doing, these projects create hedonic value for capital givers. Therefore, both the information providing and communication mechanism are broadly implemented in order to enable quick and

[2] https://www.fundedbyme.com/
[3] https://www.lendingclub.com/
[4] http://www.crowdrise.com/

comprehensive information transformation. Thus, the implementation of *project descriptions, videos and pictures, background information about capital seeker, funding history of the capital giver,* and *communication functions* are prevalent in hedonistic crowdfunding intermediation. Funding mechanisms are designed quite rigid. The *all-or-nothing principle*, *investment levels*, and *minimum investments* aim at increasing the probability of funding by pushing capital givers to invest higher amounts as they only receive their desired reward in the case of funding success. Additional, proofs of concept in form of *feasibility assessments* are mostly required in hedonistic crowdfunding intermediation in order to transform risks. A prominent example for hedonistic crowdfunding intermediation is *Kickstarter*[5].

## DECOMPOSING CROWDFUNDING SERVICE SYSTEMS

### Inner Workings of Crowdfunding Service Systems

By considering crowdfunding as a modular service system, the thesis provides pioneering knowledge about the constituting components and the inner workings of crowdfunding, which was largely neglected by current research so far. Therefore, by taking a process perspective, the service providing activities and the level of customer involvement have been modelled, and the stakeholders, involved in the service provision, have been identified. Second, respective service modules could have been derived, by grouping all processes according to their respective owner ("who is responsible for the execution?"), their proximity ("how similar are the tasks and objectives of the processes?"), and their level of customer involvement ("how close are capital seekers and capital givers involved in the process?"). The analyses led to the identification of twelve constituting service modules, which form a crowdfunding service system (see Table 3).

***Table 3: Overview of Crowdfunding Service Modules***

| **Service Modules** | **Description** |
|---|---|
| Matchmaking | An e-market place is operated in order to interconnect capital seekers & givers, create thick markets, to provide information, and to register funding decisions. |
| Contracting & Compliance | After the funding goal is reached, automatized and standardized online contracting is provided in order to ensure legal liability and compliance. Until the full repayment of the capital the compliance to |

[5] https://www.kickstarter.com/

| | |
|---|---|
| | the contract is tracked and assessed. |
| Customer Support | Crowdfunding is a more unbureaucratic way of funding. Therefore, certain activities are performed to enhance the customer relationship in order to overcome initial barriers, to clarify customer issues, and support the customer journey of capital givers and capital seekers. |
| Risk Assessment | Crowdfunding services rate risks related to the capital seeker by tracking credit-, trustworthiness, and project history. Traditional forms of risk scoring are extended by analyzing additional behavioral information (time tracking, project description). |
| Authentication | In order to meet legal regulations (Know Your Customer – KYC), prevent fraud, and reduce risks for capital seekers and givers, crowdfunding services apply comprehensive online identification and authentication processes. |
| Crowd Activation | Crowdfunding services perform the attraction, activation, and balancing of the 'right' crowd in order to ensure funding success, attractive returns and to generate network effects. Therefore, promotional activities (especially via social media) are performed. |
| Investor Relations | Crowdfunding is a more transparent and democratic way of investing. Therefore, certain activities enable instant and constant communication between the capital seekers and capital givers in order to extend the investment engagement of capital givers (e.g., performance and quality tracking of projects or investment portfolios). |
| Payment Processing | To enable a fast, reliable, and efficient flow of money between capital seekers and givers as well as the skimming of the platform fees, automatized (online) payment functionalities are provided. |
| Banking | Banking services for inter alia account management, the credit processing, the collection and provision of the capital (Pooling), and exclusive access to credit information are implemented. |
| Dunning & Debt Collection | In case of debt default effective dunning and debt collection services are needed in order to prevent or minimize the risk of investment losses. |
| IT Operations | The service provision of the CSS is enabled by a high level of interconnectivity and exchange relationships between the service modules. All service modules are characterized by a high level of |

| | |
|---|---|
| | automation and enabled by sophisticated IT support. |
| Corporate Development | By taking a management perspective, the orchestration between the service modules as well as the creation of an organizational and operational frame for a consistent service provision is crucial for a functioning and success service system. |

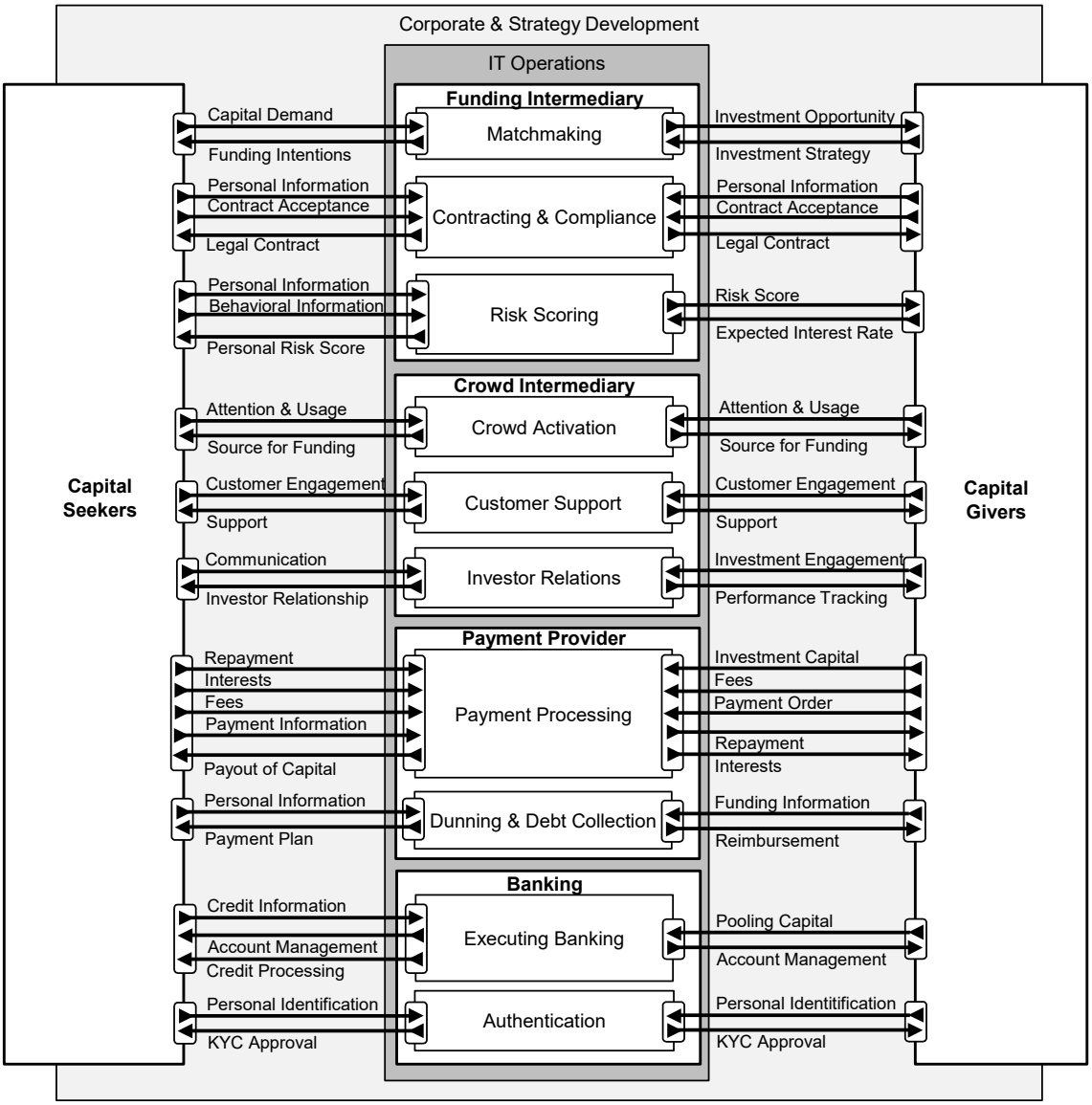
By considering the respective functioning of each service module within the core value creation (not considering the support (IT Operations) and management functions (Corporate Development)), four separate roles have been identified, which have to be assumed in order to enable the service provision within the crowdfunding service system (see Table 4). Each role bundles a set of similar service modules, which require similar competences. Therefore, these roles represents a logical structure for determining responsibilities within a service system and making outsourcing decisions.

***Table 4: Roles within Crowdlending Service Provision***

| **Role** | **Service Module** |
|---|---|
| Crowd Intermediary | Crowd Activation |
| | Customer Support |
| | Investor Relations |
| Funding Intermediary | Matchmaking |
| | Risk Scoring |
| | Contracting & Compliance |
| Payment Provider | Payment Processing |
| | Dunning & Debt Collection |
| Banking | Executing Banking |
| | Authentication |

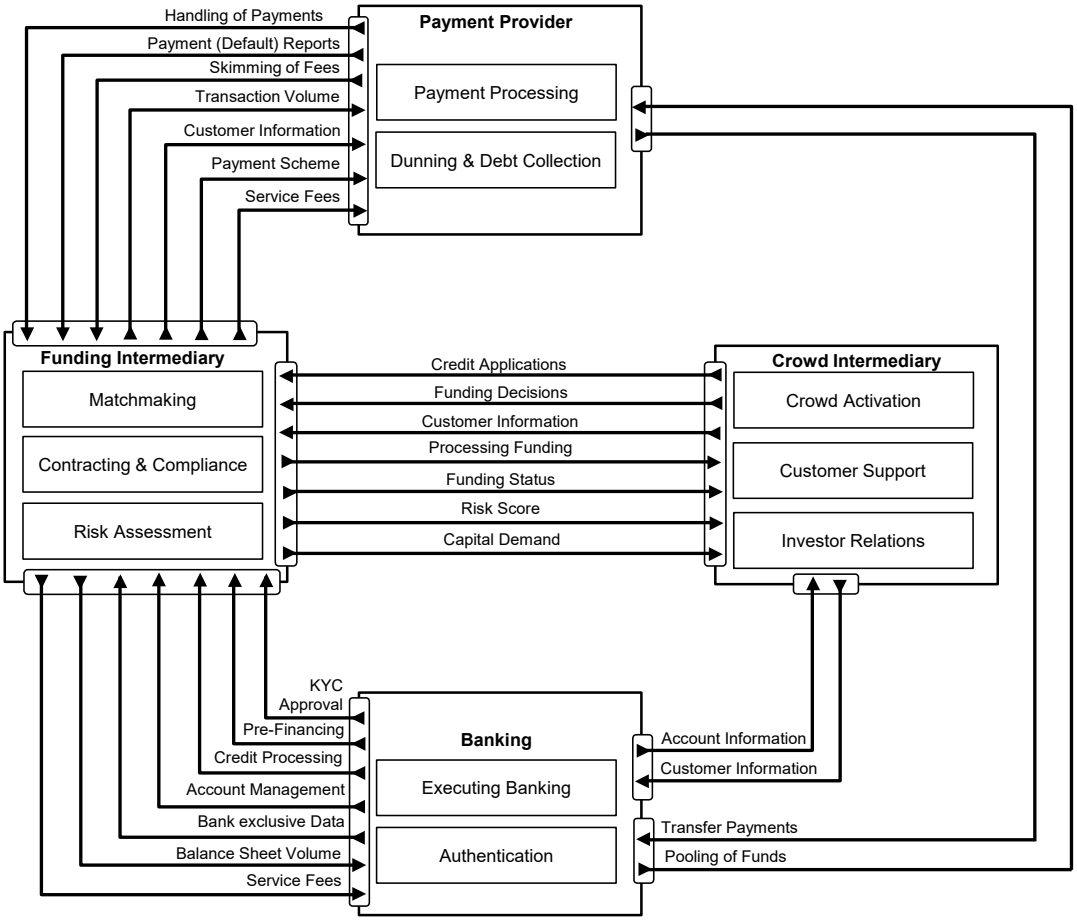
Further, more fine-grained processual analyzes, based on e3 Value (Gordijn 2002) modelling of a single case of a lending based crowdfunding service system, revealed the various value exchange relationships between the roles and capital seekers and givers (see Figure 4).

***Figure 4: Customer Exchange Relationships***




In order to shed light on the inter-role activities, the value exchange relationships between the roles, considering the comprising service modules are modelled (see Figure 5). This in depth insights in the inner workings reveals the high complexity and interconnectivity of crowdfunding service systems. It also indicates the required high degree of specialization of the single roles in order to enable the service provision of the respective service modules. Even though, all roles are necessary in order to enable the service provision within the CSS, the role of the *Funding Intermediary* seems to be the most pivotal role. The *Funding Intermediary* role orchestrates the overall service provision, while the other roles take over supporting roles.

*Figure 5: Value Exchange Relationships between Roles*




## Crowdfunding Service Configuration Framework

Based on the processual perspective and the gained knowledge about the inner workings, it is a major aim of the thesis to produce actionable knowledge for supporting the systemization and the design of crowdfunding service systems. The characteristics of the identified crowdfunding service modules differ a lot between the different crowdfunding archetypes. Thus, multiple variations of how the crowdfunding service modules are actually implemented in the crowdfunding service systems could have been identified In order to overcome the complexity especially during early stages of the design process and to provide a structured and comprehensive presentation of crowdfunding service systems, a heuristic crowdfunding service configuration framework is presented in the thesis. The crowdfunding service configuration framework takes the form of a morphological box and comprises ten service modules with in total 24 variations, which represent design choices. Further, three dominant configuration patterns with regard to the variations of the crowdfunding service modules are identified. These patterns represent logic starting

points for the systemization and design of crowdfunding service systems. The predominant parameter variations of the three design patterns are indicated by color-coding in the configuration framework (see Figure 6) - altruism: bright grey; hedonism: dark grey; profit-orientation: black.

## *Figure 6: Crowdfunding Service Configuration Framework*

| *Service Modules* | *Parameters* | *Variations* | | | |
|---|---|---|---|---|---|
| **Market Differentiation** | Crowd Motivation | Altruism | Hedonism | | Profit-Orientation |
| | Specialization | Sustainability & Social Action | Startup & New Business | Private Consumption | Creative Projects & Products |
| | Compensation | Greater Good | Reward | Interest | Profit Share |
| **Matchmaking** | Capital Giver | Individuals | | Institutional Investors | |
| | Capital Seeker | Individuals | Non-Profit Organizations | Non-Governmental Organizations | For Profit Organizations |
| **Crowd Activation** | Offline | None | Mass Advertising | | Personalized Advertising |
| | Online | None | Mass Advertising | | Personalized Advertising |
| **Customer Support** | Capital Giver Support | None | Offline Support | | Online Support |
| | | Personalized Support | Automatized Support | | Peer-to-Peer Support |
| | Capital Seeker Support | None | Offline Support | | Online Support |
| | | Personalized Support | Automatized Support | | Peer-to-Peer Support |
| **Investor Relations** | Communication Channels between capital givers/seekers | None | Traditional Communication Channel (E-Mail, Telephone, Fax etc.) | | Modern Communication Channels (Social Media, Blog) |
| | Performance Monitoring | None | Progress Bar | | Portfolio Management System |
| **Contracting** | Terms and Conditions | None | Standardized Terms of Use | Privacy Policy Regulations | Payment Regulations |
| | Legal Relationships after Funding Success | Directly between Capital Seekers and Givers | | Indirect (via financial intermediaries e.g., banks) | |
| **Risk Assessment** | Due Diligence | None | Traditional (personal data & documents) | | Data Analysis |
| | Feasibility | None | Business Plan / Project Plan | | Prototype |
| **IT Functionality & Operations** | Platform Dev. & Hosting | In-House | External Service Provider | | White-Label Solution |
| | Registration Process | None | Website Login (E-mail & Password) | | Social Login (Facebook/Google) |
| | Applications | Web Application | | Mobile Application | |
| **Payment** | Forms of Payment | Offline Payment | Traditional Direct Payment | Online Direct Payment | Direct Debiting |
| | Time of Payment | Pre-paid | | Instant-paid | Post-paid |
| | Debt Default Actions | None | Notifications | Dunning | Debt Collection |
| | Payment Processing | Directly between Peers (capital seeker and giver) | | Indirect via Financial Intermediaries | |
| **Authentication** | KYC Capital Giver | None | Personal Offline Identification | Automated Digital Identification | Personal Online Identification |
| | KYC Capital Seeker | None | Personal Offline Identification | Automated Digital Identification | Personal Online Identification |

## CROWDFUNDING SERVICE SYSTEM DESIGN FRAMEWORK

### Overview

As the competitive edge of crowdfunding is based on components, which have not been considered relevant for the financial service industry so far (Liebenau et al. 2014), incumbents such as banks are almost unable to copy innovative approaches due lacking expertise and to issues of speed and flexibility. Thus, it is a major aim of the thesis to provide actionable knowledge for the design of crowdfunding service systems. The modular perspective on crowdfunding enables the bundling of multiple competences of various partner within a crowdfunding service. By engaging with an experienced crowdfunding partner, organizational and operative shortcomings can be overcome and mutual strengths can be leveraged. The thesis provides pioneering knowledge regarding the systematic design of service systems, where the experience of incumbents and the innovative and agile character of startup partners are key to success and necessary to ensure an effective service provision. The thesis proposes the early integration of potential partners (e.g. startups), in order to enable mutual learning and the exploitation of an optimum of synergies.

Therefore, a Crowdfunding Service System Design Framework is presented as an intial step for the development of a nascent *"Theory of Design and Action"* (Gregor 2006; Gregor and Jones 2007) (see Figure 7). This framework provides explicit design knowledge comprising a systematic design process of five interrelated design steps Preparation, Partnering, Exploration, Design, and Implementation. Additionally, each step comprises a reflection loop, which helps to reconsider the fit to previous requirements, assumptions and objectives. Finally, for each design step respective lessons learned are presented, which represent prescriptive design knowledge and illustrates a course of action for the successful design of service systems. It is not the aim of the proposed design framework to provide a comprehensive methodological toolbox for each design step individually, but to present an overarching design process and specific lessons learned for supporting the systematic and effective design of service systems.

# Service System Design Framework

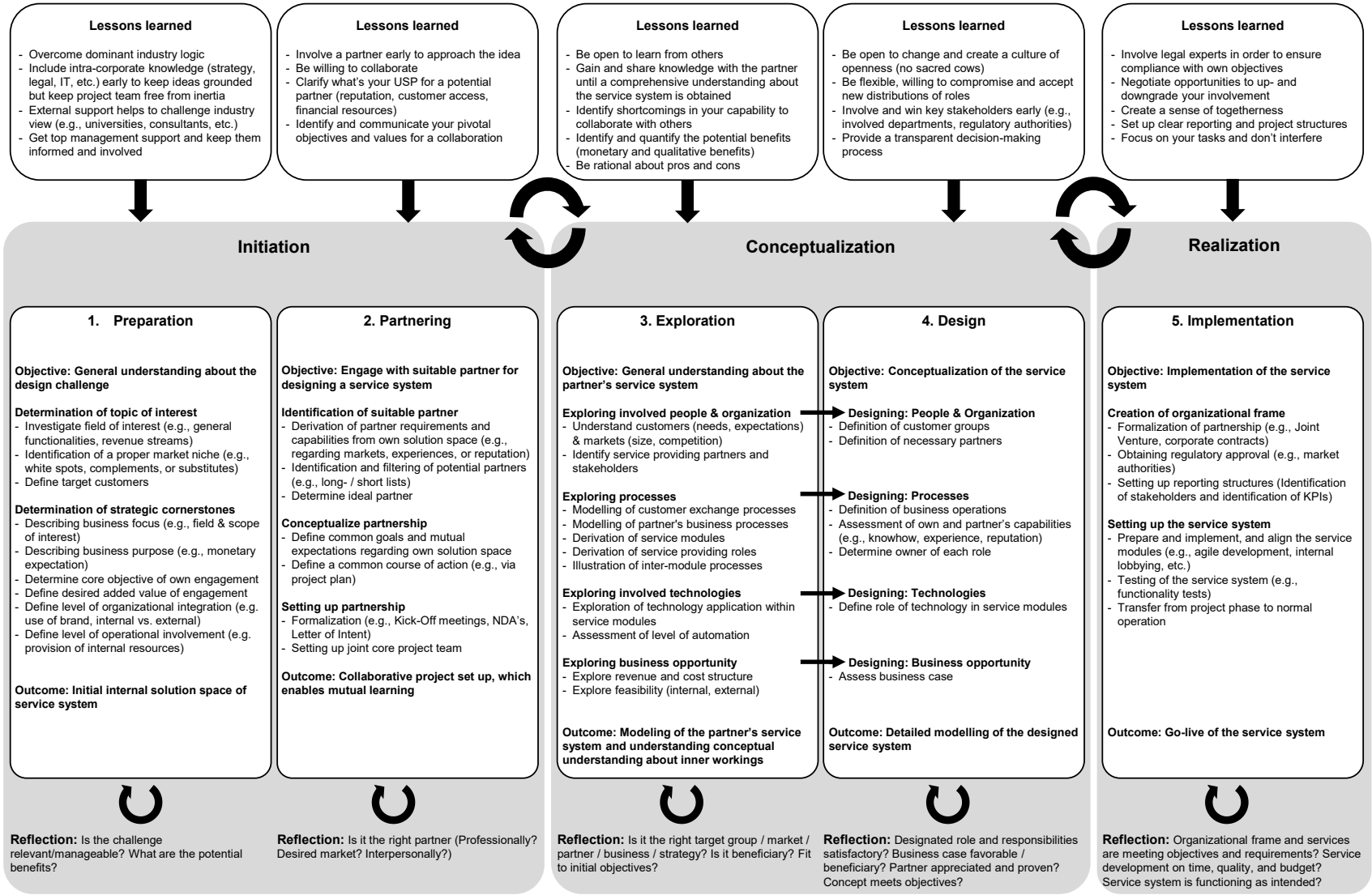



*Figure 7: Overview Service System Design Framework*

***Initiation Phase***

The Initiation Phase is the starting point for an incumbent, which plans to systematically design a service system with a partner from the digital world. This phase comprises two design steps – 1. Preparation and 2. Partnering. The objective of the initiation phase are to get a general understanding about the design challenge and the engagement with an appropriate partner for the design of the service system.

1. Preparation

The initial detection of a topic of interest, which should be approached together with a partner from the digital world is the prerequisite of the proposed design process. This general interest in the phenomenon has to be transferred into an actual market definition. This market definition has to identify a proper market niche, e.g., by identifying white spots, complements, or substitutes within the market or the current product portfolio. Thus, specific customer groups have to be identified in order to keep the design focused. Besides, strategic cornerstones have to be defined during this step. Therefore, it is crucial to determine the specific business focus and the business purpose, e.g., whether the service system aims at gathering experiences with digital online-business or whether monetary expectations are pursued. Throughout this clarifications, the core objective as well as the added value of engaging in the service system has to be determined. Further, it is necessary to determine the organizational integration of the service system and the level of the company involvement. Thus, decisions regarding how close the service system should operate next to current products (e.g., M&A, joint ventures, financial participation, or mere cooperation) and how deep the incumbents plans to be involved in the operational service provision (e.g., use of logo, customer data, strategic / operational infrastructure) should be defined.

Preparing the upcoming design steps is a though challenge, as it requires overcoming the dominant industry logic. The inclusion of external support like e.g., universities, consultants, etc. helps to include external and neutral experts and thus, challenge dominant industry or company views. However, in order to ensure the effectiveness of the design, it is necessary to keep the nascent ideas grounded. Therefore, it is helpful to consult broad intra-corporate knowledge and experts from different departments like e.g., strategy, legal, IT, etc. However, by relying too much on these experts might cause problems to overcome industry logics. Thus, the project team should be kept free from inertia. Therefore, top management support is crucial in order to balance visionary thinking and grounding ideas.

After developing a general understanding about the market and the defined solution space of the pursued service system, the project team should reflect, whether the topic is actual relevant, whether the design challenge is manageable, and whether the potential benefits and opportunities meet the requirements and overweigh the potential threats. This reflection serves as basis for a decision of whether the design should continue to the next step, or whether it should be revised or terminated.

2. Partnering

If the preparation step was performed successfully, the next step focuses on identifying a suitable partner and setting up a collaboration, which enables the mutual design of the service system. Grouping together in such an early stage is useful in order to enable quick knowledge transfer, exploiting mutual synergies, and overcoming industry and company bonds. Therefore, in a first step, partner requirements have to be determined regarding the partner's current markets, business model, reputation, or previous experiences with e.g. internationalization, cooperation, or regulatory issues. Additionally, it is important to identify the own strengths, which potential partner's might desire to gain through a cooperation (e.g., reputation, customer access, customer base, financial resources, etc.), and what the own weaknesses are in order to bridge the gap. To know the own realistic value and to develop a strong value proposition for potential partners is crucial for achieving strong bargaining power. However, for many incumbents it is hard to accept that collaborating with growth companies make them the junior partner in the co-operation, as they barely have operational knowledge and are depending on the partner's knowledge. Based on the requirements potential partners can be identified by screening the market and a long list can be put together. By assessing the potential partners on the long list regarding additional requirements or a more fine grained analyses, a short list of a few suitable partner can be created. The potential partners on the short list should be prioritized and an initial contact established via a non-committal exchange in order to assess the fit to the intended strategy, pivotal objectives, and intentions and to identify the ideal partner.

After determining the ideal partner, the partnership should be conceptualized. Therefore, the incumbent's solution space has to be evaluated with the partner's expectations and revised if necessary. Following, common goals and a common course of action has to be defined. If both parties agree to the common intention, the collaboration should to be formalized. Therefore, a joint project team comprising know-how on the market, business operations, regulation and compliance issues, and financial planning has to be set up and officially sworn in. In order to show mutual

commitment and setting the boundaries of the collaboration Non-Disclosure Agreements (NDA) and a Letter of Intent (LoI) can be signed.

The progress throughout the partnering step should be continuously reflected, in order to assess whether it is really the right partner in terms of requirements, expectations, and shared intentions. Otherwise, a new partner has to be identified or even the own solution space revised. If the partnership has been formularized, the next design step can be approached.

***Conceptualization Phase***

The Conceptualization Phase builds on the results of the Initiation Phase and aims on actually developing the service system. This phase comprises two closely interrelated steps – 3. Exploration and 4. Design. Both activities follow the four elements of service systems – people, organization, processes, and technology. Thus, the objectives of the conceptualization are achieving a general understanding about operating a service system and its constituting elements, and afterwards, designing the service system.

3. Exploration:

After setting up the partnership, the aim is to explore the partner's service system. In order to explore insights regarding people the partner's customers, their needs, expectations and requirements have to be analyzed. Following, this insights have to be transferred and validated at the target market, also considering the actual and potential market size, the competitive situation, and legal and regulatory situation.

In order to explore insights regarding organizations, the involved stakeholders of the partner's service system have to be identified.

In order to gain insights regarding constituting processes and the inner workings of the service system four steps have to be conducted. 1) The partner's business operations have to be explored by modelling all customer exchange and service processes. 2) By grouping the processes based on ownership ("who is responsible for the execution?"), their proximity ("how similar are the tasks and objectives of the processes?"), and their level of customer involvement ("how close are customer groups involved in the process?") a set of service modules can be identified. 3) By grouping the identified service modules according to their business function within the value creation of the service system - management, service (including sales, operation, transaction-related, cross-transaction activities), or supporting activities – the constituting roles of the

service system can be defined. 4) Finally, the inter-role relationships can be modelled in order to gain insights in the inner workings of the service system.

In order to explore the role of technology within the service system, the application of technology in each service module and the level of automation have to be assessed.

In order to ensure the effectivity of the exploration together with the partner, it is necessary to be willing to learn from the partner in order to acquire expert knowledge from the partner. In this vein, own shortcomings in the capability to collaborate with others and running a service system can be identified.

Insights regarding the business opportunity can be explored by analyzing the revenue and cost structure and conducting analyses regarding the internal (e.g., financial capabilities, monetary expectations, and available resources) and external (e.g., legal and regulatory issues) feasibility.

Throughout the reflection of this step, the conducted activities and assumptions so far should re-evaluated. In this vein, one should assess, whether the focus lies on the correct target group and market, and whether the right strategy and business objectives are pursued. Additionally, during achieving a comprehensive understanding about the design challenge and the service system it is necessary to reflect, whether it is still the right partner and whether it is beneficiary to further engage or not.

4. Design

During the final step of the conceptualization phase the actual design decisions of the service system is performed based on the gained knowledge of the exploration phase. Therefore, decisions regarding the explored four elements of service systems have to be made.

With regard to people and organization the precise customer groups and the necessary partner have to be defined. Concerning the processes and inner workings, the explored knowledge has to be transferred to the incumbent's context and solution space. Therefore, the incumbent's and partner's capabilities regarding each service module have to be assessed based on strengths and weaknesses (e.g., knowhow, experience, and reputation). After assessing the capabilities and the alignment of the capabilities with the prerequisites, defined in the solution space, the optimal ownership of each role has to be determined. In order to determine the ownership it is crucial to be willing to compromises, to create a culture of openness, and to accept new distributions of roles and operational influence. Further, design decisions regarding the

role of technology in the service modules. In this way, an overall conceptualization of the service system emerges, which comprises all stakeholder, service modules, and exchange relationships. Building on this conceptualization, the business opportunity can be assessed, based on a business case, which serves as basis for the implementation of the service system. In order to ensure fast design progress, key stakeholders (e.g., internal departments, regulation authorities, etc.) should be kept informed and all participating stakeholders should provide transparency regarding their decision-making processes.

Throughout the reflection, it is necessary to ask oneself, whether the designated role and responsibilities are satisfactory and whether the proposed business plan is favorable and beneficiary regarding the own objectives. Additionally, the reflection loop should assess whether the designated partner is still appreciated and the expectations are proven.

***Realization Phase***

The Realization Phase comprises the final step of the service system design process - 5. Implementation. The Implementation step focuses on managing the go live of the service system.

5. Implementation

The final design step, focusses on the implementation of the service system. In this vein, the organizational frame has to be created. Therefore, the partnership has to be formalized by concluding the necessary contracts (e.g., joint venture or corporate contracts), obtain the regulatory approval by the market authorities, and setting up appropriate reporting structures. Thus, the collaboration ensures an effective, efficient and compliant service provision. Throughout the contractual negotiations the early involvement of experienced legal advisors is pivotal in order to enforce the conceptualized and intended design. However, the formalization of the conceptualized service system, remains a critical point, as crucial decisions have to be made regarding conflicting views, which have been avoided so far. This might cause revisions of the conceptualization and delays of the implementation process. In order to overcome differences (e.g., different expectations of strategies, roles and responsibilities) a sense of togetherness shall be created.

Besides the organizational framing, the services needs to be prepared, implemented and aligned in order to perform the service provision within the aggregated service system. Afterwards, the service system can be set up and tested. After agreeing to roles

and the distribution of responsibilities every partner should focus on their tasks and don’t interfere others, except through the agreed ways, which were defined in the organizational frame (e.g., the supervisory boards).

Throughout the reflection, the organizational frame and services needs to be critically assessed, whether they meet the own objectives and requirements. Further, the implementation and the service development itself needs to be reflected and evaluated with regard to time, quality, and budget. Finally, the service system needs to be evaluated, whether it is functioning as intended or not.

# 4. OVERVIEW OF PUBLICATIONS

The underlying thesis addresses the three research questions, outlined in the introduction, by in total six publications. These represent the core of this thesis. Besides, several complementary publications supplement my research effort and are outlined at the end of the dissertation. This section provides an overview over the six core papers and the paper's contribution to the research questions.

## GENERAL OVERVIEW OF PUBLICATIONS

Table 5 provides an overview over the publications included in the dissertation and my main contribution to each paper.

| No. | Publication | Chapter |
|---|---|---|
| 1 | Haas, P.; Blohm, I. & Leimeister, J.M. (2014): An Empirical Taxonomy of Crowdfunding Intermediaries. In: 35th International Conference on Information Systems (ICIS), Auckland, New Zealand. | 5 |
| | *Contribution to: RQ1* | |
| 2 | Haas, P.; Blohm, I. & Leimeister, J.M. (2017): How Do Crowdfunding Intermediaries Perform Financial Intermediation? Mechanisms And Archetypes. In: IWI Working Paper, St. Gallen Switzerland. | 6 |
| | *Contribution to: RQ1* | |
| 3 | Haas, P. & Blohm, I. (2017) Blueprinting Crowdfunding - Designing a Crowdfunding Service Configuration Framework. In: 13th International Conference on Wirtschaftsinformatik (WI), 12.-15.02.2017, St. Gallen, Switzerland. | 7 |
| | *Contribution to: RQ2* | |
| 4 | Haas, P.; Blohm, I.; Peters, C. & Leimeister, J.M. (2015): Modularization of Crowdfunding Services - Designing Disruptive Innovations in the Banking Industry. In: 36th International Conference on Information Systems (ICIS), 13.-16.12.2015, Fort Worth, USA. | 8 |
| | *Contribution to: RQ3* | |

| | | |
|---|---|---|
| 5 | Blohm, I.; Haas, P.; Peters, C.; Jakob, T. & Leimeister, J.M. (2016): Managing Disruptive Innovation through Service Systems – The Case of Crowdlending in the Banking Industry. In: 37th International Conference on Information Systems (ICIS), 11.-14-12.2016, Dublin, Ireland. | 9 |
| | *Contribution to: RQ3* | |
| 6 | Haas, P. (2017): Towards a Theory for Designing Service Systems – The Case of Crowdlending in the Banking Industry. In: IWI Working Paper, St. Gallen, Switzerland. | 10 |
| | *Contribution to: RQ2 + RQ3* | |

***Table 5: Overview over included publications***

## SUMMARY OF PUBLICATION 1

***An Empirical Taxonomy of Crowdfunding Intermediaries***
*Haas, P.; Blohm, I. & Leimeister, J.M. (2014)*
*Proceedings of the 35th International Conference on Information Systems (ICIS), 14.-17.12.2014, Auckland, New Zealand.*

Within the first publication an empirical taxonomy of crowdfunding intermediaries is developed, as existing classifications of crowdfunding intermediaries are conceptual, lack theoretical grounding, and are not empirically validated. Therefore, the paper reviews the theories of two-sided markets and financial intermediation in order to derive theoretically grounded distinctive characteristics of crowdfunding intermediaries. Thus, a crowdfunding intermediation model is described that builds on the insights that crowdfunding performs the three functionalities of traditional financial intermediaries – lot size, risk, and information transformation – by interlinking two customer groups – capital seekers and capital givers – within a multi-sided market. Therefore, in total 14 characteristics, which allow the differentiation of crowdfunding intermediaries regarding the capital seekers, capital givers, funding mechanisms, specializations, and the form of compensations are described.

These characteristics have been used as foundation for performing cluster analyses with data of 127 intermediaries, which led to the identification of three generic archetypes of crowdfunding intermediaries. The three archetypes - Hedonism, Altruism, and For Profit - describe fundamentally distinguishing orientations, which reveals the necessity of differentiating competences and business practices in order to enable a successful service provision and handling of the respective challenges.

This study contributes to RQ1 - *How is crowdfunding performing financial intermediation?* - as it makes a first foray into considering crowdfunding from a conceptual systemic perspective. Thus, it describes crowdfunding as a phenomenon, which evolved from traditional financial intermediation and manifests in one of three possible configurations in order to perform the financial intermediation within differentiating contexts. Therefore, it provides an anchor for the basic structure, functioning, and archetypes of crowdfunding intermediation, which serves as basis for all following studies.

## SUMMARY OF PUBLICATION 2

***How Do Crowdfunding Intermediaries Perform Financial Intermediation? Mechanisms and Archetypes***

*Haas, P.; Blohm, I. & Leimeister, J.M. (2019)*

*IWI Working Paper, available at https://www.alexandria.unisg.ch/257437/, St. Gallen, Switzerland.*

The second publication deepens the insights gained in the first publication. As traditional financial intermediation theory falls short in explaining how crowdfunding brings demand and supply for capital to equilibriums, the second publication presents a system theory of crowdfunding. By taking a functional perspective on the theory of financial intermediation and applying it to the crowdfunding context, the generic differences of how the transformation functions of traditional financial intermediaries are performed are worked out. This led to the identification of a set of 12 mechanisms and three respective dominant configuration patterns, which are implemented in order to perform crowdfunding intermediation.

Following a mixed method approach, the publication builds on the data, collected in the first publication and a second round of data collection. By performing content-analyses with regard to how the crowdfunding intermediation mechanisms are implemented in the 178 investigated crowdfunding intermediaries. We then apply cluster analysis in order to verify the three timely robust archetypes of crowdfunding intermediation, which have already been presented in publication 1 – philanthropic, hedonistic, and profit-oriented crowdfunding. Additionally, the alignment of each platform with its respective archetype is assessed and investigated over time. The survival analysis showed that a higher alignment leads to a higher proximity of survival and thus, to a higher effectiveness of the crowdfunding intermediation.

This publication concludes to answer RQ1 - *How is crowdfunding performing financial intermediation?* - by proposing a theory of crowdfunding intermediation that unravels the constituting components of crowdfunding intermediation and reflects a theoretically grounded, empirically validated, and temporally stable taxonomy of crowdfunding intermediation. Additionally, the second publication improves the understanding of how the Internet affects and disrupts traditional financial intermediation.

## SUMMARY OF PUBLICATION 3

***Blueprinting Crowdfunding - Designing a Crowdfunding Service Configuration Framework***

*Haas, P. & Blohm, I. (2017)*

*Proceedings of the 13th International Conference on Wirtschaftsinformatik (WI), St. Gallen, Switzerland*

Building on the previous insights, a systemic perspective is needed in order to understand the service provision of crowdfunding intermediaries. These comprise a complex combination of IT and non-IT based services, different stakeholders, and diverging contexts and purposes. Thus, the design and operation of such complex service systems, comprising multiple modules, represents a tough challenge. As only little is known about the constituting components of a crowdfunding system, the third paper addresses the RQ2 of *"how can crowdfunding service system be decomposed"*. By conducting three iterations within a design science approach - 1) problem specification, 2) designing the configuration framework, and 3) identifying dominant design patterns - a crowdfunding service configuration framework in the form of a morphological box, which comprises the constituting service modules and respective variations, was derived. Therefore, the customer journey, the ecosystems, and the single complementary activities of each stakeholder were modelled, based on the information gained throughout twelve expert interviews and three case studies. Afterwards, the activities have been modularized according to defined modularizing parameters. Each identified service module represents a bundle of activities regarding specific processes within the configuration framework. The crowdfunding service configuration framework aims to support the design activities especially during early-stages by reducing the complexity of crowdfunding service systems. Further, the modular design within a morphological box provides a structured and comprehensive presentation of crowdfunding service systems, by combining a functional and component perspective.

Additionally, three dominant design patterns, as archetypal designs for respective purposes, could be identified, which serve as a starting point for design activities. Therefore, the crowdfunding service configuration framework has been used to code 161 crowdfunding platforms. Afterwards, the codings were grouped according to its respective crowdfunding archetype – altruism, hedonism, and profit-orientation. The three groupings showed large internal proximity regarding several service modules,

which allows a clear distinction of the groups. Thus, three dominant design patterns could be defined.

Thus, this publication answers RQ2 by providing insights in the constituting service modules of crowdfunding service systems by applying modelling and modularization techniques. Thereby, it supports insights in the systematic design of crowdfunding service systems, by reducing their complexity, and giving a comprehensive overview over their building blocks.

## SUMMARY OF PUBLICATION 4

***Modularization of Crowdfunding Services - Designing Disruptive Innovations in the Banking Industry***

*Haas, P.; Blohm, I.; Peters, C. & Leimeister, J.M. (2015)*

*Proceedings of the 36th International Conference on Information Systems (ICIS), 13.-16.12.2015, Fort Worth, USA.*

The fourth publication transfers the previous findings of the systemization and conceptualization of crowdfunding to the actual field of use, by focusing on the design of a crowdlending service system in the banking industry. Therefore, this research in progress investigates how incumbents of the financial service industry can exploit this new phenomenon by leveraging the modular structure of crowdfunding service systems. So far, incumbents struggle to utilize the potential of crowdfunding, as it is based on modules that have not been considered relevant for banking so far. Nevertheless, crowdfunding is not entirely new compared to traditional banking, as certain crucial bank-typical competences are necessary in order to enable the crowdfunding service provision. Thus, the modular design enables the bundling of the traditional competences of a bank with the disruptive elements, which are mostly driven by innovative fintech startups. This approach leverages on the typical modularization benefits such as reuse, module-wide innovation, rapid re-configuration, and faster development of new service offerings. Following this logic, the study proposes an action research project with a large Swiss bank, in order to investigate how modularization enables the bank to design a crowdlending service systems.

The action research approach comprises three cycles – Conceptualization, Modularization, and Implementation. As this publication was research in progress, only the first cycle was concluded for preliminary results. Thus, by analyzing several crowdlending service systems, a general impression of the underlying service system, its components, and their interrelations could be derived.

This publication paves the way for answering RQ3, by bridging the topics of crowdfunding, service systems, and modularization. Further, this publication contributes to RQ3 by narrowing the topic of interest from systemizing, structuring, and conceptualizing crowdfunding service systems in general to the actual challenge of designing crowdfunding service systems within particular contexts.

## SUMMARY OF PUBLICATION 5

***Managing Disruptive Innovation through Service Systems – The Case of Crowdlending in the Banking Industry***

*Blohm, I.; Haas, P.; Peters, C.; Jakob, T. & Leimeister, J.M. (2016)*

*Proceedings of the 37th International Conference on Information Systems (ICIS), 11.-14-12.2016, Dublin, Ireland.*

Following the outlined agenda of the previous study, the fifth publication contributes to RQ3 by laying emphasis on the challenges of engaging with innovative business approaches and designing crowdfunding services systems as a bank. The fifth publication presents a pilot case study of a bank, which tries to engage in the crowdfunding market.

The publication reveals the bank's lacking sense of innovativeness and flexibility to adapt new trends, as their previous success particularly resulted from their stable and continuous rigidity. This caused huge legacy systems and optimized business activities, which build on centralism, isolation, and reticence. However, these paradigms became to be threatened by innovative business approaches, building on systemic thinking, cooperation, and openness. Reinforced by the growing skepticism toward banks since the banking crisis, in particular crowdfunding experienced a boosting growth, which forces banks to engage with these topics. This represents a major challenge for the bank, as neither their organizational structure, their technical infrastructure, nor their corporate culture is capable and flexible enough to realize, manage, and leverage the opportunities crowdfunding provides.

Following this argument, the publication proposes the joint and mutual engagement with an experienced crowdfunding partner as a way, not only to overcome the bank's shortcomings in terms of lacking expertise and internal resentments, but also to develop better crowdfunding service systems by leveraging on the strengths of both partners. Therefore, the case study describes the joint engagement with a partner as a way of quickly obtaining crucial knowledge about the operation of crowdfunding service systems and bypass internal obstacles.

## SUMMARY OF PUBLICATION 6

***Designing Crowdfunding Service Systems – Towards a Nascent Design Theory***
*Haas, P. (2019)*
*IWI Working Paper, available at: https://www.alexandria.unisg.ch/257438/,St. Gallen, Switzerland*

This final publication completes the research in progress (publication 4) and builds upon the insights outlined in the previous case study (publication 5). By investigating, how incumbents of traditional industries can mutually design service systems with a partner from the digital world, in order to explore and exploit new business opportunities the sixth publication answers RQ3. Additionally, the sixth publication details the knowledge regarding RQ2, by illustrating the inner workings of a crowdlending service system

Therefore, this publication reports from the findings of an action design research project together with a large Swiss bank from 2014 to 2016. As the bank struggled to design a profitable crowdfunding service system due to a lack of operational expertise and organizational capability, the publication follows the logic that the decomposition and modularization approach allows the bundling of competences of multiple partners into a consistent service provision. Therefore, the early engagement of an incumbent with an experienced partner from the digital world allows the mutual gaining of the necessary insights and enables the profitable design of service systems.

Following the ADR approach, first, the constituting components have been systematically conceptualized. Therefore, all activities, exchange relationships, and involved stakeholders have been analyzed on a process level. Thus, service providing roles could have been derived and assigned to the bank and the respective partners, which resulted in the final design of a crowdlending service system.

Additionally, by formularizing the learnings from the project, we describe actionable design knowledge as an initial step for the formulation of a theory of design and action, which provides guidance for incumbents throughout the design of service systems together with a partner from the digital world. This theory comprises a framework of five iterative steps, respective lessons learned, and reflection loops.

# 5. PUB. 1: AN EMPIRICAL TAXONOMY OF CROWDFUNDING INTERMEDIARIES

*Philipp Haas, Ivo Blohm & Jan Marco Leimeister*

Reference:
*Haas, P.; Blohm, I. & Leimeister, J.M. (2014): An Empirical Taxonomy of Crowdfunding Intermediaries. In: Proceedings of the 35th International Conference on Information Systems (ICIS), Auckland, New Zealand.*

**Abstract**

Due to the recent popularity of crowdfunding, a broad magnitude of crowdfunding intermediaries has emerged, while research on crowdfunding intermediaries has been largely neglected. As a consequence, existing classifications of crowdfunding intermediaries are conceptual, lack theoretical grounding, and are not empirically validated. Thus, we develop an empirical taxonomy of crowdfunding intermediaries, which is grounded in the theories of two-sided markets and financial intermediation. Integrating these theories, we develop a crowdfunding intermediation model that we use as foundation for performing cluster analysis with data of 127 intermediaries. We identify three generic archetypes of crowdfunding intermediaries, which differ in their value proposition: Hedonism, Altruism, and For Profit. Our crowdfunding intermediation model and our empirical taxonomy improve our understanding of crowdfunding by showing how crowdfunding intermediaries manage financial intermediation and digitally transform exchange relations between capital-giving and -seeking agents in two-sided online markets. For practice, our research may help characterize the crowdfunding industry.

**Keywords:** Crowdfunding, empirical taxonomy, two-sided markets, financial intermediation, cluster analyses

## INTRODUCTION

Recently crowdfunding has emerged as a new way of funding innovative projects, products, or companies. Crowdfunding directly interlinks capital-seeking agents (i.e., initiators of crowdfunding projects such as artists, entrepreneurs, etc.) and a crowd of capital-giving agents (i.e. investors, backers, supporters, or funders). Belleflamme et al. (2013) define crowdfunding as collective financing by an undefined crowd by means of an internet-based open call. This definition follows the thought of crowdsourcing, where a certain task is spread to an undefined crowd by an open call (Estellés-Arolas and González-Ladrón-de-Guevara 2012). Thus, funding activities are no longer restricted to financial institutions such as banks, venture capitalists or business angels but opened up to the public, such that anybody can participate according to their individual financial and mental capabilities. Although the concept of collective financing is not new, e.g., the Statue of Liberty's pedestal had been partly funded by an open call within Joseph Pulitzer's newspaper *The World* (Harris 1985), the internet has boosted the scope and the potentials of the phenomenon (Belleflamme et al. 2013). The underlying mechanisms of the internet economy have shaped crowdfunding to be a novel class of financial intermediaries. Unlike traditional intermediaries, crowdfunding intermediaries characterized by co-creation as capital-giving agents are frequently and systematically involved in the development and commercialization of the funded projects by the capital-seeking agents. This leads to the emergence of a magnitude of small and specialized long tail offers for both markets served by the intermediary, the capital-seeking and -giving agents, and to an increased importance of network effects leading to phenomena such as herding (Burtch 2011) or the wisdom of crowds (Surowiecki 2005).

As a consequence, a broad magnitude of different crowdfunding intermediaries has emerged. Initially, crowdfunding was used to collect donations or funding for small creative projects without monetary rewards, e.g., underground musicians involving their fans in financing their next studio album (fan funding). The application of crowdfunding further expanded to loans between private persons in which capital-giving agents receive interests for borrowing money (peer-to-peer-lending)(Burtch et al. 2013b). Alongside with steadily increasing projects and investments, private-to-business loans and equity-based crowdfunding indicate the next steps(Baeck and Collins 2013). So far, our understanding of these different types of crowdfunding is still very limited. Current crowdfunding research has predominantly focused on investment decisions and motivation of capital-giving agents (Agrawal et al. 2010;

Burtch 2011; Burtch et al. 2013a), motivations of capital-seeking agents (Gerber et al. 2012), or the dynamics of successfully funded crowdfunding projects (Mitra and Gilbert 2014a; Mollick 2014). By contrast, research on crowdfunding intermediaries has been largely neglected. As a consequence, there are many different conceptualizations hampering our understanding of crowdfunding. For instance, Belleflamme et al. (2013), Ordanini et al. (2011), Bradford (2012), and Hemer (2011) proposed first classifications that differ between 2, 3, 5, or 7 archetypes of crowdfunding intermediaries. In practice, the classification promoted by the consulting agency Massolution (2013) gained widespread attention consisting of the four crowdfunding types crowd-supporting, crowd-donation, crowd-lending and crowd-investing. All these classifications are conceptual in nature, lack theoretical grounding, and are not empirically validated. Lin et al. (2014) were among the firsts to argue that crowdfunding is manifold and addresses diverse interests and therefore, has to be considered differentiated. We will follow this thought. In order to understand the dynamics of crowdfunding, one has to understand how crowdfunding today actually works, and what the constituent parts are, as well as how crowdfunding intermediaries differentiate. Without this knowledge, the dynamics in this context cannot be traced. Information systems are responsible for enabling crowdfunding and an in-deep understanding about this topic helps to develop better solutions for the effective and efficient utilization of this new way of funding. Further, crowdfunding as an umbrella term is much to general in order to serve as precise definition of a research object. In order to examine any field of interest within the topic of crowdfunding, one has to clearly differentiate which type of crowdfunding is actually being studied, since the characteristics between these different crowdfunding types do differ substantially, as shown in this study.

Thus, in this paper we address the question: Which theoretically grounded and empirically validated archetypes of crowdfunding intermediaries do exist? We answer this by developing an empirical taxonomy of crowdfunding intermediaries embedded in the theory of two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) and financial intermediation (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). Taxonomies reflect empirical tools for building complex filing systems describing a phenomenon in its defining traits (Rich 1992). As a first step of taxonomy development, we develop and describe a crowdfunding intermediation model, consisting of distinctive characteristics. Second, we use this framework to collect data on 127 crowdfunding intermediaries, with which

we perform a cluster-analysis in order to identify the three distinct archetypes Hedonism, Altruism and For Profit, which are representing the value propositions of the crowdfunding intermediaries. Thus, it is the purpose of our taxonomy to characterize the generic exchange relationships and their influences of the crowdfunding intermediation model.

This study provides two important contributions. First, the theory integration may help develop a better understanding of how the internet affects financial intermediation. By that, theory of two-sided markets provides explanation for the participating stakeholders – capital-seeking, capital- giving agents and the crowdfunding intermediary – while financial intermediation theory provides a functional description of crowdfunding functionalities. Second, we provide a systematic and comprehensive taxonomy of crowdfunding intermediaries. Our taxonomy extends existing classifications of crowdfunding intermediaries as it is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon. Our results allow for much deeper insights into the phenomenon of crowdfunding. This will help to systematize and synthesize research on crowdfunding.

The paper proceeds as follows. In section 2, we develop a crowdfunding intermediation model illustrating how crowdfunding intermediaries bridge capital-seeking and -giving agents, which serves as foundation for our empirical taxonomy. In section 3, we propose our methodological approach. Section 4 illustrates our results which are then discussed in section 5.

## CONCEPTUAL AND THEORETICAL BACKGROUND

### Crowdfunding

At first, crowdfunding research has focused on investment decisions of capital-giving agents. Agrawal et al. (2010) show that investment decisions are geographically biased. Burtch (2011) and Burtch et al. (2013b) analyze the prevalence of herding and free riding behavior of capital-giving agents. Lin et al. (2014) investigated archetypes of capital-giving agents. Ahlers et al. (2012) investigate signaling in equity crowdfunding, whereas Lin et al. (2013) and Zvilichovsky et al. (2013) study the influence of social networks on investment decision and overall funding success of projects. Similarly, Mollick (2014) and Mitra (2014a) study success factors of crowdfunding projects. Authors also addressed capital-seeking agents. Gerber et al. (2012) studied capital-seeking agents' motives, while Belleflamme et al. (2013) focus on selection decisions for crowdfunding intermediaries. Similarly, Ordanini et al.

(2011) examine different types of capital-giving agents, whereas Hui et al. (2013) investigated these agents' tasks in crowdfunding. Similarly, Schwienbacher and Larralde (2012) examine conditions for effective use of crowdfunding for startups. Further, Burtch et al. (2013c) evaluate the use of information hiding mechanisms by capital-seeking agents.

By contrast, research on crowdfunding intermediaries has been very limited. Most notably, Wieck et al. (2013) investigate how information systems for crowdfunding startups can be developed, piloted, and evaluated. Besides, some authors systematized crowdfunding intermediaries based on the returns capital-giving agents receive for their investment. Belleflamme et al. (2013) identify the two poles pre-ordering (i.e. The capital-giving agents purchase a subscription right for the future product. Pre-order prices are usually lower than later selling prices.), and profit-sharing. Bradford (2012) differentiates crowdfunding intermediaries from a legal perspective by what capital-giving agents get in return for their investment. He differentiates between the five types of donation, rewards, pre-ordering, lending, and equity (i.e. profit sharing). Building on this classification, the consulting agency Massolution (2013) differentiates between crowd supporting (subsuming Bradford's (2012) rewards and pre-ordering), crowd lending, crowd investing and crowd donating. Hemer (2011) distinguishes the seven types of donation, sponsoring, pre-ordering, membership fees, crediting, lending, and profit-sharing. However, these classification are of conceptual nature and neither theoretically grounded nor empirically validated. Further, they neglect the role of crowdfunding as financial intermediation and two-sided market, which are the pivotal ideas underlying the concept.

**Theory of Two-sided Markets**

A multi-sided market is mainly characterized by multiple sets of agents, who are interacting through an intermediary and these groups of agents affect each other through network externalities (Rysman 2009). In crowdfunding two groups of agents are interacting on the crowdfunding intermediary's platform - capital-seeking and capital-giving agents. Therefore, crowdfunding can be seen as two-sided market. The intermediary acts as electronic matching market, enabling the agents to efficiently exchange information about prices and offerings in order to overcome information asymmetries and to minimize transaction costs (Bakos 1991; Bakos 1998; Mahadevan 2000; Malone et al. 1987). The matching platform's attractiveness for one group of agents increases if more agents of the other group sign up, which is referred to as network effect (Caillaud and Jullien 2003; Damiano and Li 2008). To attract both

groups of agents, the intermediary chooses strategies and functionalities of pricing and openness (Rysman 2009). The individual pricing mechanism for both groups of agents depends on a joint set of demand elasticities and is regulated by intermediary functionalities (Rochet and Tirole 2003; Rochet and Tirole 2006; Weyl 2009). In crowdfunding these functions represent the intermediary's funding mechanism. Openness refers to the decision of exclusiveness and positioning towards other crowdfunding intermediaries (Rysman 2009), which can be interpreted as the crowdfunding intermediary's specialization. Therefore, theory of multi-sided markets provides a general idea of basic crowdfunding intermediation, by describing the exchange relationship between the participating stakeholders. These are capital-seeking and capital-giving agents, which are mediated by a crowdfunding intermediary by mechanism determining exchange and openness.

**Financial Intermediation Theory**

Theory of financial intermediation details the exchange relationships and functionalities of crowdfunding intermediation. Financial intermediaries are ubiquitous institutions of economies and pivotal in the saving-investment process, where financial intermediaries lend capital, borrowed from numerous capital-giving agents, to a large number of capital-seeking agents, using debt contracts for both (Gorton and Winton 2003). Financial intermediation theory builds on models of resource allocation between capital-seeking and capital-giving agents by a market-making mechanism (Benston and Smith 1976). Capital-giving agents have different possible returns based on the amount and type of their initial investment. The simplified model of financial intermediation is shown in Figure 8

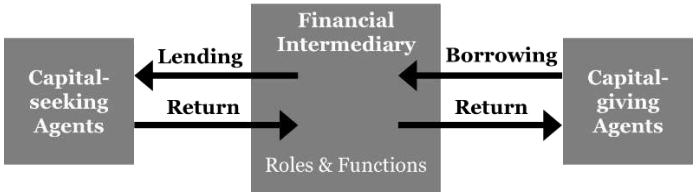



**Figure 8: Financial Intermediation (based on Gorton and Winter (2003) as well as Benston and Smith (1976))**

Financial intermediaries provide services in imperfect markets, which are characterized by transaction costs (Benston and Smith 1976; Gurley and Shaw 1966)

and information asymmetries (Campbell and Kracaw 1980; Fama 1980; Leland and Pyle 1977; Schumpeter 1939). For investigating financial intermediaries, Merton (1989) suggests a functional perspective rather than an institutional perspective. The functions of traditional financial intermediaries can be summarized to lot size, risk, and information transformation (Allen and Santomero 1998; Diamond 1984; Fama 1980; Niehans 1978).

**Lot Size Transformation:** Financial intermediaries provide payment systems for the exchange of goods as well as mechanisms for pooling funds in order to transfer economic resources through time, geographies, and industries (Merton 1989). Thus, financial intermediaries act as consumption smoothers and liquidity providers (Diamond and Dybvig 1983; Freeman 1996; Gorton and Winton 2003).

**Risk Transformation:** Financial intermediaries are managing and trading risks and uncertainties (Merton 1989). According to Diamond (1984), financial intermediaries are able to minimize the significant costs of monitoring due to diversification, and bundling of monitoring activities, as well as avoiding the problem of free riding of capital-giving agents. Thus, financial intermediaries reduce the risk associated with financial transactions (Gorton and Winton 2003).

**Information Transformation:** Since only capital-seeking agents possess information about the true characteristics of their project, Leland & Pyle (1977) showed that financial intermediaries might efficiently reduce information asymmetries by providing reliable information. Further, Haubrich (1989) addresses the trust and reputation building benefits of an enduring relationship between capital-giving agents and intermediaries. Thus, financial intermediaries are handling information asymmetries and provide price information (Merton 1989) and by that they act as information producers (Gorton and Winton 2003).

**Crowdfunding as Digitally Transformed Financial Intermediation**

Considering crowdfunding from theory of two-sided markets provides a general understanding of the participating stakeholders and their exchange relationships. In crowdfunding capital-seeking and capital-giving agents are interacting on the crowdfunding intermediary's platform. Internet-based businesses like crowdfunding might lower transaction costs and facilitate matching agents directly, both leading to disintermediation and redundancy of intermediaries (Bakos 1998; Mahadevan 2000). However, the role of intermediation rather faces changed challenges and functions. In contrast to traditional financial intermediaries, crowdfunding intermediaries are not

involved in the actual funding process. Crowdfunding intermediaries do not borrow, pool, and lend money on their own account. The intermediary provides certain functionalities and performs as electronic matching market in order to overcome information asymmetries and to minimize transaction costs (Bakos 1991; Bakos 1998; Mahadevan 2000; Malone et al. 1987). As participating agents in crowdfunding are diverse as well as geographically and culturally dispersed, crowdfunding intermediaries are able to exploit and handle the existence of information asymmetries and risks, as they bring price-quality-combinations close to efficient informational combinations (Mahadevan 2000). In order to understand how two-sided markets like crowdfunding reduce information asymmetries and transaction costs they have to perform the three transformation functions, derived from financial intermediation theory (Allen and Santomero 1998; Diamond 1984; Fama 1980; Niehans 1978). To illustrate crowdfunding as digitally transformed financial intermediation in a two-sided market, as well as to identify similarities and dissimilarities, and to derive distinctive features of crowdfunding intermediaries, the roles and functions of financial intermediaries have to be matched with the functions of two-sided markets, like crowdfunding (see Table 6).

| **Function** | **Implementation by Financial Intermediaries** | **Implementation by Intermediaries of Two-sided Markets, e.g. Crowdfunding** |
|---|---|---|
| Lot size transformation | • Payment system for exchange of goods and services (Merton 1989)<br>• Mechanism for pooling funds (Merton 1989)<br>• Transfer economic resources through time, geographies, and industries (Merton 1989)<br>• Smoothing consumption (Diamond and Dybvig 1983; Gorton and Winton 2003)<br>• Providing Liquidity (Diamond and Rajan 1999; Freeman 1996; Gorton and Winton 2003) | • Matching capital-giving and -seeking agents enables successful funding (Belleflamme et al. 2013; Mollick 2014; Schwienbacher and Larralde 2012)<br>• Providing mechanisms for payment, exchange of capital, and returns like electronic markets (Bakos 1998)<br>• Bridging capital-giving and capital-seeking agents overcoming time, geographies or industry boundaries (Agrawal et al. 2010; Bakos 1998)<br>• Regulating demand by applying specialized funding mechanisms (e.g., pledge levels) (Mitra and Gilbert 2014a) |

| | | |
|---|---|---|
| Risk transformation | • Managing uncertainty and risk (Allen and Santomero 1998; Merton 1989)<br>• Delegated monitor (Gorton and Winton 2003) | • Assessing credits of the capital-seeking agents<br>• Pre-selecting investment opportunities (projects)<br>• Acting as neutral, trustworthy and objective partner, ensuring integrity (Bakos 1998). |
| Information transformation | • Handling information asymmetries (Fama 1985; James 1987; Kane and Burton 1965; Merton 1989)<br>• Providing price information (Merton 1989)<br>• Producing information (Gorton and Winton 2003; Leland and Pyle 1977)<br>• Commitment mechanism (Gorton and Winton 2003; Haubrich 1989) | • Bundling information (Burtch et al. 2013c)<br>• Providing information about investment opportunities (projects) for capital-giving agents (Ahlers et al. 2012; Mitra and Gilbert 2014a)<br>• Acting as electronic market place enabling capital-seeking and -giving agents to exchange information about investment opportunities and returns (Bakos 1998; Mahadevan 2000)<br>• Enabling formation of relationships between agents, which is a major source for information and trust (Lin et al. 2013; Zvilichovsky et al. 2013) |

***Table 6: Functional Perspective of Crowdfunding as Financial Intermediation***

Thus, it is shown that crowdfunding is a two-sided market, linking capital-seeking and capital-giving agents via a crowdfunding intermediary. The intermediary applies a certain strategy regarding the funding mechanism and its specialization. Two-sided markets, like crowdfunding are able to reduce transaction costs and information asymmetries by applying similar transformation functions like traditional financial intermediaries. To enable the capital-intermediation process, which can be described as the exchange of funding-capital for a certain return, the crowdfunding intermediary applies a bundle of regulatory funding mechanism, as described in theory of two-sided markets (Rysman 2009). Further, the crowdfunding intermediary chooses a strategy of openness (Rysman 2009). Thus, focuses on a certain project specialization and certain type of capital-giving and -seeking agents. In sum, crowdfunding represents a two-sided market, consisting of capital-seeking and capital-giving agents, who are mediated by a crowdfunding intermediary, which transforms lot sizes, risk, and

information, thus, acting as financial intermediaries. In so doing, they reduce transaction costs and information asymmetries using web 2.0 approaches. Thus, by embedding crowdfunding in the theory of two-sided markets and financial intermediation theory, a digitally transformed model of classic financial intermediation can be presented, which is shown in Figure 9. As the single characteristics differ, it seems reasonable to conclude that different types of crowdfunding intermediaries exist, which differ in their basic orientation. These divergent cores of the crowdfunding intermediary refer to their value proposition.

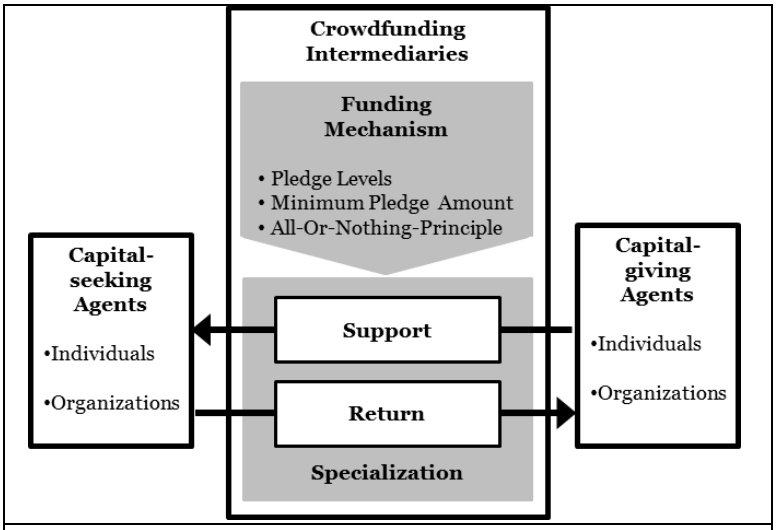



**Figure 9: Crowdfunding Intermediation Model**

**Capital-seeking and -giving Agents:** Acting as market makers, crowdfunding intermediaries bridge capital-seeking and -giving agents. Most frequently, capital-giving agents are private person, while capital seeking agents are both private persons (Gerber et al. 2012; Verstein 2011) and organizations, like startups or NGOs (Belleflamme et al. 2013; Bradford 2012; Schwienbacher and Larralde 2012). Besides, the recent adoption of the JOBS-act in the USA indicate, that there are also organizational capital-giving agents (Mollick 2014; Ordanini et al. 2011).

**Funding Mechanisms:** In order to fulfill the transformation functions, crowdfunding intermediaries provide particular funding mechanisms, like pledge levels, minimum pledge amounts and the all-or-nothing-/keep-it-all-principle (Gerber et al. 2012; Mitra and Gilbert 2014a; Mollick 2014; Walsh 2014). Capital-seeking agents define levels of possible pledge amounts. Each pledge level includes a certain return, which increases with higher pledge amounts (e.g., a thank you email for 1 USD, or a poster for 10

USD). A minimum pledge amount defines the lowest possible sum, which can be pledged by the capital-giving agents. Central to crowdfunding is the decision between the all-or-nothing or the keep-it-all principle (Cumming et al. 2014). Applying the all-or-nothing-principle, capital-seeking agents are only granted the collected money if their funding goal has been reached. This is also a type of risk control as it is based on the assumption that capital-seeking agents are only able to accomplish their project and deliver the promised returns in case they have the required resources for doing so. However, there are also some intermediaries that are based on the keep-it-all-principle with which capital-seeking agents receive any collected sum (Gerber et al. 2012).

**Return Types:** In traditional financial intermediation, capital-giving agents usually receive financial compensation as return for their investment. In the case of crowdfunding, capital-seeking agents also offer investment opportunities, but the particular returns for capital-giving agents may highly vary. According to Bradford (2012), there are five returns with respect to their legal traits: (1) No compensation in case that capital-giving agents support projects for the greater good (donations); (2) Rewards in case capital-giving agents receive a non-monetary return; (3) Pre-ordered product, if the capital-giving agent's support was a prepayment; (4) Interests in case that capital-giving agents participated in a loan; (5) Profit shares, if capital-giving agents receive some form of equity from the project (e.g., a startup).

**Specialization:** The internet economy is characterized by so called hyperspecialization (Malone et al. 2011). Decreased transaction costs and information asymmetries enable crowdfunding to raise funds for a broad variety of niche projects that would have limited access to more traditional sources of finance. Extending this argument, crowdfunding may create a long tail for the financial service industry in which a magnitude of project with little financial requirements are funded and which cannot be served profitably by traditional financial intermediaries (Anderson 2004). Serving these highly heterogeneous needs, crowdfunding shows a very high degree of specialization in which a magnitude of niche intermediaries has emerged serving a particular segment of the crowdfunding market. The specialization of crowdfunding intermediaries may vary between creative projects and creative products (Agrawal et al. 2010), startups and new businesses (Ahlers et al. 2012; Burtch 2011; Schwienbacher and Larralde 2012) or sustainability and social action (Burtch et al. 2013a; Burtch et al. 2013b).

## METHODOLOGY

### Taxonomy Development

In general, the process of taxonomy development can be divided in the phases of deriving distinctive characteristics for the taxonomy framework as well as clustering homogenous entities (i.e. the objects that shall be classified with the taxonomy; in our case crowdfunding intermediaries) using these characteristics (Fiedler et al. 1996; Larsen 2003; Malhotra et al. 2005; Sabherwal and King 1995). Based on these two steps, Nickerson et al. (2013) propose a more fine-grained approach. They suggest the definition of meta-characteristics in the first instance that represent the most comprehensive traits of the entities and mimic the taxonomy's main purpose. Based on these holistic meta-characteristics, more fine-grained characteristics reflecting distinctive features between entities, enabling comparison and measuring of similarities and differences are then developed (Crowson 1970; McKelvey 1982; Rich 1992). First, we defined the purpose of our taxonomy as distinguishing different archetypes of crowdfunding intermediaries based on their constituent parts. Crowdfunding intermediaries reflect a complex system consisting of several building blocks which differ substantially in their roles and functions. In order to understand these systems, it is not sufficient to consider the single components separately, but rather to analyze their interaction in the system (Ackoff 1971). According to the purpose of our taxonomy, we followed a deductive approach in order to derive 6 meta-characteristics of the crowdfunding intermediation model by reviewing theory of two-sided markets. By expanding our literature review to financial intermediation theory, we then identified 14 single characteristics and instantiations, which are the logical consequence of the derived meta-characteristics.

### Data Collection and Variables

In order to develop our empirical taxonomy, we analyzed a total of 127 crowdfunding intermediaries. Initially, we identified over 500 crowdfunding intermediaries. Crowdfunding intermediaries have been considered for further analysis if they possessed a working, public accessible English or German website, as well as active business operations (i.e. a track record of successfully funded projects) during the time of research (October 2012 to December 2013). These criteria applied to 254 crowdfunding intermediaries such that a random sample of 127 intermediaries was drawn for detailed analysis (50%). We derived 6 meta-characteristics and 14 characteristics by linking crowdfunding to theory of two-sided markets and financial intermediation. Table 7 provides an overview of these characteristics. We developed a

coding scheme to content-analyze the websites of each crowdfunding intermediary. Each characteristic of our taxonomy framework was presented by a dichotomous variable indicating whether a certain type of characteristics occurred on a given crowdfunding intermediary or not (e.g., whether or not a crowdfunding intermediary enables capital-seeking agents to offer a certain type of reward such as interests to capital-giving agents). In order to ensure reliability of the content analysis, a subset of 47 randomly picked crowdfunding intermediaries was re-coded by a second researcher. The intercoder reliability was checked using Cohen's Kappa. The value of 0.69 indicates substantial agreement (Landis and Koch 1977). As the recoding took place six month after the initial coding, we ensure a sufficient degree of stability of the characteristics.

| **Meta-Characteristic** | **Characteristic / Variable** | **Description** | **Example** |
|---|---|---|---|
| Capital-giving Agents | Individual Capital-giving-Agents | Capital-giving agents, who are private individuals | A private person, who wants to pledge for a caring project |
| | Organizational Capital-giving Agents | Capital-giving agents, who are organizations or professional investors | A business angel, looking for investment opportunities |
| Capital-seeking Agents | Individual Capital-seeking Agents | Capital-seeking agents, who are private individuals | A private person, who needs money to buy a new car |
| | Organizational Capital-seeking Agents | Capital-seeking agents, who are organizations | A company, which needs a loan to expand its business |
| Return Type | Rewards | Participation on the premise of receiving a non-financial reward | Signed music album of the supported artist |
| | Interests | Participation on the premise of receiving an interest payment in addition to the amortization of the loan | Interests paid for a P2P-microloan |
| | Profit Shares | Participation on the premise of receiving a share in the project | An annual profit share of 1% on the pledged equity |

| | | | |
|---|---|---|---|
| | No return | Participation out of idealism with no expectation to receive any form of physical or monetary return | Donation to a NGO |
| Funding Mechanism | All-or-Nothing-Principle | All-or-Nothing ties the payout of collected funds to a pre-defined minimum level of funding. Keep-it-all disburses all funding regardless of the amount | In an All-or-Nothing setting, projects only receive funds when minimum amount is raised |
| | Minimum Pledge Amount | Requirement of a certain minimum amount of investment to control the number of investors due to risk-related and administrative reasons | A minimum of 100 EUR has to be pledged |
| | Pledge Levels | The return of the investment is tied to certain pre-defined levels of capital input | Higher investment means better reward |
| Specialization | Sustainability & Social Action | Projects which focus on sustainable & caring engagement | Solar-energy projects |
| | Startups & New Businesses | Projects which aim at the founding of businesses | Young enterprises |
| | Creative Products & Projects | Projects which support the realization of creative ideas | Artist support |

***Table 7: Overview of Cluster Variables***

We further collected data on the average project volumes and the number of active projects for each intermediary. Following the approach of Malhotra et al. (2005), these two variables were not included in our cluster analysis, but used as external criteria to judge the plausibility of our taxonomy. Data for both variables were collected on a five-point scale where we used five anchors that we derived inductively and deductively following Nickerson et al. (2013).

### Cluster Analysis

The taxonomy development process suggested by Nickerson et al. (2013) focuses on the development of mutually exclusive and collectively exhaustive characteristics for developing taxonomies. Thus, we performed cluster analysis to classify crowdfunding intermediaries. A cluster analysis groups entities such that the in-group variation is small in relation to the variation across groups (Aldenderfer and Blashfield 1984; Lorr 1983; Malhotra et al. 2005). By defining distinctive variables, the cluster analysis groups crowdfunding intermediaries according to their reciprocal similarities and differences (Tryon and Bailey 1970). A cluster analysis is a useful method to develop empirical taxonomies describing generic archetypes of a phenomenon (Everitt et al. 2011; Hair et al. 2009). A cluster analysis follows three basic steps. First, proximities or distances between the entities have to be determined. Then, entities are grouped according to these measures using a grouping algorithm. Finally, the optimal number of clusters has to be determined. To avoid idiosyncratic errors peculiar to a specific proximity and distance measure, we tested different proximity (Jaccard, Simple Matching) and distance measures (Euclidean distance) with Ward's algorithm. We report only results using the Euclidian Distance and Ward's grouping algorithm as this combination seems most appropriate for the goals of our research and all combinations produced highly similar results indicating rather robust results. Both, Euclidian Distance and Ward's grouping algorithm are applicable for dichotomous data and have been found to produce reliable results (Van de Vrande et al. 2009). We focused only on hierarchical-agglomerative grouping algorithms as our aim was to identify clusters and not to validate an already existing number of clusters as in partitioning grouping algorithms. As the focus of the paper is not to over-interpret the membership of single crowdfunding intermediaries to a certain cluster, but rather to develop an empirical taxonomy and the generic characterization of the clusters, we used various methods to validate the number and the robustness of clusters. We used a two-step cluster analysis, a visual inspection of the dendogram and the scree-plot, as well as the Mojena-test for identifying the appropriate number of clusters (Milligan and Cooper 1985; Mojena 1977).

## RESULTS

The results of the cluster analysis indicate a robust three cluster solution that can be clearly interpreted. To validate the number of clusters, we first inspected the dendogram as well as the scree-plot which both clearly suggested the existence of three distinct clusters. Second, we performed a Two-Step cluster analysis, using the

Schwarz Bayesian criterion, also indicating three clusters. Finally, we applied the Mojena-test, applying a stopping rule of 2.75 (Mojena 1977), also confirming the three cluster solution.

After validating the cluster structure, we conducted further descriptive analysis using cross tabulation and contingency analysis to characterize the clusters and to test whether the identified characteristics contribute to the differentiation of crowdfunding intermediaries. As both the cluster variables and the variable indicating the attribution of crowdfunding intermediaries to the clusters were categorical, we used Pearson's $\chi^2$, Cramer V, and Goodmann & Kruskal's symmetric $\lambda$ to test whether or not the study variables significantly differ across clusters (Everitt 1977). We analyzed global differences across all three clusters and then applied post-hoc tests, in which we compared single clusters. In order to ensure that the analysis represents a realistic picture of crowdfunding intermediaries, the assignment of intermediaries to clusters was manually verified for plausibility (Malhotra et al. 2005). Table 8 gives an overview of the results of the cluster analysis. These results indicate that our theoretically derived characteristics and cluster variables significantly differ among intermediaries. The only exceptions reflect capital-seeking and -giving agents where we investigated whether the dominant group of agents is individuals or organizations. Our analysis shows that most participating capital-seeking and -giving agents in all clusters are individuals and that variation among clusters is low. By contrast, Cluster 3 shows a significant higher concentration of organizational capital-seeking and -giving agents. We thus followed Nickerson et al. (2013) and did not delete these characteristics from our analysis as we considered the type of participating agents a highly important trait of crowdfunding intermediaries.[6] Our results indicate that all other cluster variables differ significantly across clusters.

| **Category** | **Characteristic** | **Cluster** [a] | | | **Significance Tests** | | | **Significant Cluster Differences** |
|---|---|---|---|---|---|---|---|---|
| | | **1 n=48** | **2 n=48** | **3 n=31** | ***χ2*** | **Cramer V** | ***λ*** | |
| Capital-giving Agents | Individual Capital-giving Agents | **100%** | **100%** | 96.8% | 3.02 | .154 | .012 | 1-2; 1-3; 2-3 |

[6] We also performed the cluster analysis without considering the type of capital-giving and -seeking agent variables and obtained almost identical results.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Organizational Capital-giving Agents | 10.4% | 33.3% | **58.1%** | 20.35*** | .400*** | .153 | 1-2**; 1-3***; 2-3* |
| Capital-seeking Agents | Individual Capital-seeking Agents | 64.6% | **75.0%** | 61.3% | 1.97 | .124 | .042 | 1-2; 1-3; 2-3 |
| | Organizational Capital-seeking Agents | 58.3% | 54.2% | **83.9%** | 7.85* | .249* | .0160 | 1-2; 1-3*; 2-3** |
| Return | Reward | **93.8%** | 14.6% | 6.5% | 83.37*** | .810*** | .602*** | 1-2***; 1-3***; 2-3 |
| | Interest | 2.1% | 4.2% | **41.9%** | 32.15*** | .503*** | .126*** | 1-2; 1-3***; 2-3*** |
| | Profit Share | 6.3% | 0.0% | **64.5%** | 60.18*** | .688*** | .284* | 1-2; 1-3***; 2-3*** |
| | No Return | 29.2% | **93.8%** | 9.7% | 65.21*** | .717*** | .518*** | 1-2***; 1-3*; 2-3*** |
| Funding Mechanism | All-Or-Nothing-Funding | **93.8%** | 20.8% | 54.8% | 52.03*** | .640*** | .470*** | 1-2***; 1-3***; 2-3** |
| | Pledge Levels | **91.7%** | 12.5% | 32.3% | 64.05*** | .710*** | .561*** | 1-2***; 1-3***; 2-3* |
| | Minimum Pledge Amount | 64.6% | 16.7% | **100%** | 55.67*** | .662*** | .404*** | 1-2***; 1-3***; 2-3*** |
| Special-ization | Sustainability & Social Action | 10.4% | **64.6%** | 22.6% | 33.77*** | .516*** | .328*** | 1-2***; 1-3; 2-3*** |
| | Startups & New Businesses | 8.3% | 0.0% | **74.2%** | 69.64*** | .741*** | .358** | 1-2*; 1-3***; 2-3*** |
| | Creative Projects & Products | **41.7%** | 4.2% | 6.5% | 26.17*** | .454*** | .175* | 1-2***; 1-3***; 2-3 |

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

[a] Percentages of crowdfunding intermediaries in one cluster, which show a given characteristic; bold values indicate the cluster with the highest occurrence of a given characteristic

[b] Significance between Clusters is tested using *Pearson's* $\chi^2$

***Table 8: Results of Crosstab Analysis***

In order to further characterize the three clusters and substantiate the evaluation of their plausibility, we performed an ANOVA in which average project volumes and

active projects per crowdfunding intermediary served as dependent variables. There were significant differences regarding project volumes ($p < 0.01$) and amount of active projects across the three clusters ($p < 0.01$). *Bonferroni* post-hoc comparisons reveal that crowdfunding intermediaries in Cluster 3 have significant higher project volumes and less active projects ($p < 0.01$) than the intermediaries in the other two clusters. There are no differences between intermediaries in Cluster 2 and 3.

**Cluster 1 – Hedonism**

The cluster Hedonism primarily describes crowdfunding intermediaries, where capital-giving agents pledge for innovative and creative projects and products without receiving financial compensation or other monetary returns. The predominant type of return is reward in form of pre-ordered products, gimmicks, or thank you gifts. Besides, donations by capital-giving agents are quite common. A typical representative intermediary within this cluster is *Kickstarter*[7] on which capital-seeking agents propose innovative products or other creative projects such as the well-known *Pebble*[8] smartwatch or the Oscar-winning movie *Inocente*[9]. These projects have in common that they try to address the capital-giving agents' sense of interest, desire, or joy. Thus, it is the intermediary's value proposition to strive for creating hedonic value that is realized by supporting such projects. On all intermediaries in the Hedonism cluster, capital-giving agents predominantly reflect individuals. Capital-seeking agents reflect both individuals and organizations. Funding mechanisms are designed quite rigid, as the all-or-nothing principle, pledge levels, and minimum pledge amount dominate in exchange of financial support and rewards. This rigidity is deemed at reducing the risk of underfinancing and motivating capital-giving agents to pledge higher amounts increasing the probability of funding. Hedonism intermediaries are characterized by a large number of small projects. More than 56% of investigated intermediaries entailed 20 or more active projects while 68.8 percent of the projects were seeking for less than EUR 5,000.

**Cluster 2 - Altruism**

Within the cluster Altruism, capital-giving agents predominantly support crowdfunding projects by donations (93%) such that they neither receive financial nor non-financial compensation for their support. Most projects have a focus on social and ecological projects, or other matters of sustainability. An exemplary intermediary

[7] https://www.kickstarter.com/
[8] https://www.getpebble.com/
[9] http://www.inocentedoc.com/

includes *Crowdrise*[10], which comprises of charity projects like donations for victims of environmental disasters. The nature of these projects and the absence of any returns for capital-giving agents suggest that the crowdfunding intermediary primarily emphasizes participation for the greater good and for altruistic reasons. Due to the specialization on sustainability and social action, most intermediaries in this cluster apply quite loose funding mechanisms, which emphasize the contribution to the altruistic nature. Most intermediaries apply a keep-it-all-principle such that capital-seeking agents also receive the pledged money in case the project did not reach the intended amount. Consequently, intermediaries refrain from minimum pledge amounts and pledge levels in order to avoid donation barriers. Individual capital-giving agents are also dominating this cluster. Intermediaries in this cluster primarily consist of a large variety of small-sized projects. More than 60% of investigated intermediaries entailed 50 or more active projects while 75 percent of the projects were seeking for less than EUR 5,000.

**Cluster 3 – For Profit**

Intermediaries in the third cluster For Profit predominantly offer financial returns for the support of capital-giving agents. These returns may include shared future profits, that may be generated by the crowdfunding project (e.g., capital-giving agents receive some sort of equity capital for a startup), or interest rates for a loan. Therefore, they pursue a value proposition, which is based on the satisfaction of monetary needs. Most intermediaries in this cluster focus on financing startups or similar entrepreneurial ventures. Consequently, capital-seeking agents predominantly consist of organizations (83.9 %) while also individuals are quite common (61.3%). Capital-giving agents consist primarily of individuals but also a significant share of organizational capital-giving agents. Typical intermediaries in this cluster include *FundedByMe*[11], which offers a profit-sharing model, or *Prosper*[12], on which capital-seeking agents may receive loans. Funding mechanisms are reflected by moderate rigidity. The funding mechanisms all-or-nothing and keep-it-all are equally applied. Most intermediaries in this cluster apply minimum pledge amounts. In the case of profit-sharing, this ensures to keep the number of capital-givers, thus co-owners, small. As equity participation is subject to special legal regulation, cost and complexity of handling a broad co-owner structure might be too high and complicates a future sale of the company. Intermediaries are usually characterized by a small number of active projects (e.g.,

[10] http://www.crowdrise.com/
[11] https://www.fundedbyme.com/
[12] https://www.prosper.com/

76.6% of intermediaries have less than 20 projects) but high project volumes. 58.6% of intermediaries handle projects with an average volume of more than EUR 20,000.

## DISCUSSION AND CONCLUSION

This study presents crowdfunding as digitally transformed model of financial intermediation, by embedding crowdfunding in the theory of two-sided markets and financial intermediation. This analysis enabled us to derive 14 distinctive, theoretically grounded characteristics for classifying crowdfunding intermediaries. Based on these characteristics, we developed an empirical taxonomy of crowdfunding intermediaries applying cluster analysis. This empirical taxonomy describes three distinct archetypes of crowdfunding intermediaries, which can be prototypically named Hedonism, Altruism, and For Profit. Figure 10 illustrates the three different archetypes of crowdfunding intermediation. Speaking from the perspective of the crowdfunding intermediary, these archetypes are characterized by different value propositions with which crowdfunding intermediaries try to differentiate themselves from other intermediaries. These value propositions represent the generic orientation, which is pursued by the crowdfunding intermediary and define how they organize financial intermediation between capital-seeking and –giving agents. The most distinctive and formative characteristics are reflected by returns and the specializations of crowdfunding intermediaries, which can be interpreted as core of the value proposition. Hedonism intermediaries offer rewards as return and specialize on creative products and projects. Altruism intermediaries enable donations for the greater good addressing sustainable and social projects. For Profit intermediaries grant interests and profit-shares as returns pre-dominantly focusing on startups and new businesses. In a similar vein, the archetypes implement funding mechanism of varying rigidity. Altruism intermediaries show a relaxed level of rigidity in order maximize the fundraising potential of the projects, while the high rigidity level of the Hedonism archetype focuses on the feasibility of the projects in order to reduce risks for capital-giving agents. For Profit intermediaries are characterized by moderate funding mechanisms. On the one hand, minimum pledge amounts ensure a controlled capital structure. On the other hand, both keep-it-all and all-or-nothing principles are used. This indicates that engaging in such projects is riskier, as higher sums have to be pledged and, in the case of the keep-it-all principle, it is lacking the safety net of underfinanced projects. While the For Profit archetype is characterized by large project volumes (> 20,000 EUR) and a lower number of projects (<20), the ratio is turned around for the archetypes Hedonism and Altruism. They show a large number of

projects with low project volumes. Individual capital-giving agents are addressed by all archetypes. Organizational capital-giving agents are only relevant for For Profit intermediaries. Additionally, also organizational capital-seekers are mostly found in this cluster. This indicates that this archetype seems to be the most professional one.

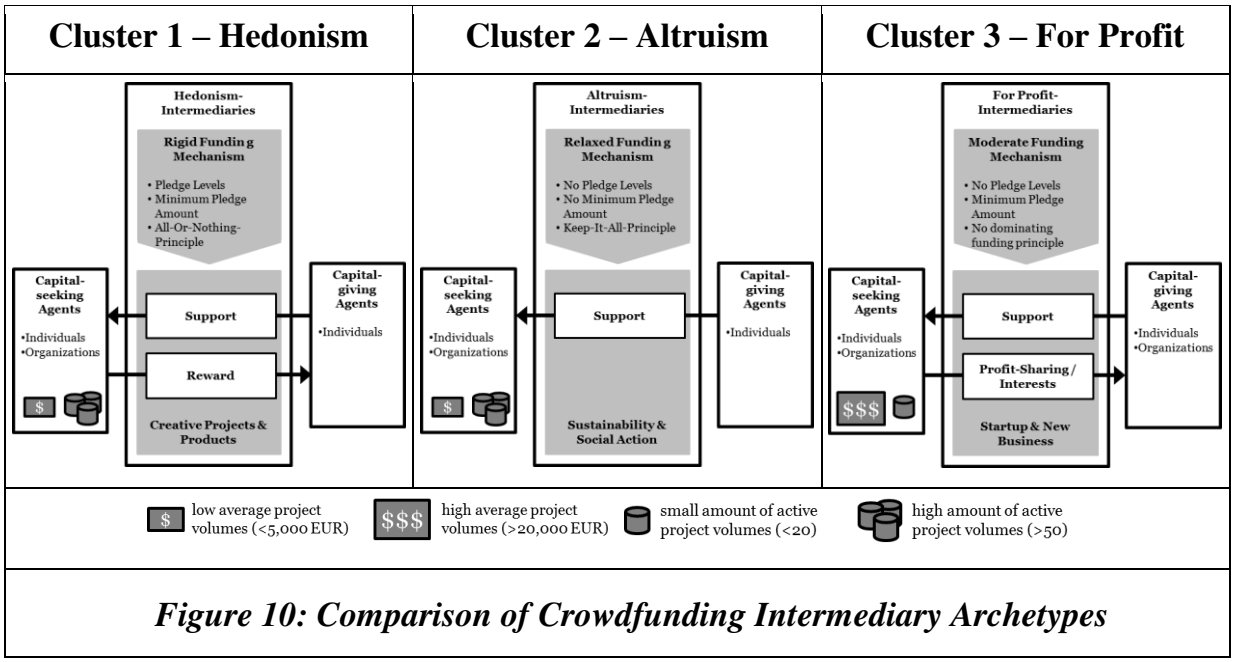



***Figure 10: Comparison of Crowdfunding Intermediary Archetypes***

The Hedonism cluster is characterized by a value proposition that tries to address enjoyment and arousal to attract potential capital-giving agents with non-monetary rewards like playful, original, and creative products. They enable capital-giving agents to satisfy their curiosity and make them feel like innovators, who are among the first possessing an innovation. By contrast, the value proposition of the cluster Altruism calls on the selflessness of capital-giving agents and promotes a greater good, without providing any kind of return apart from feelings of altruism. These intermediaries thus rather reflect online fundraising campaigns, which enable everybody to call for donations. The For Profit value proposition aims at a monetary orientation such that these intermediaries show in principle high similarity to the traditional financial service industry. Whereas this classification appears to be intuitively meaningful, we follow Rich (1992) for discussing the quality of our empirical taxonomy, who describes seven requirements valid classifications:

1. **Breadth:** In order to ensure sufficient breadth of our approach, we screened more than 500 crowdfunding intermediaries to get a comprehensive market overview.
2. **Meaning:** Our taxonomy is designed upon a broad theoretical foundation, combining the theories of financial intermediation and two-sided markets with

crowdfunding. This reveals that crowdfunding intermediaries are too complex to be considered as a homogenous group, which justifies the necessity of a classification system for crowdfunding intermediaries.

3. **Depth:** In order to ensure sufficient depth of our classification, we follow the taxonomy development process suggested by Nickerson et al. (2013) in order to develop collectively exhaustive characteristics for the identification of archetypes. This approach allowed us to account for all important characteristics of crowdfunding intermediaries as proposed by research and practice.
4. **Theory:** Embedding crowdfunding intermediaries in the theories of two-sided markets and financial intermediation provides a theoretically based understanding of the three crowdfunding intermediaries.
5. **Quantitative measurement:** The assignment of crowdfunding intermediaries to specific crowdfunding types is the result of an empirical, multivariate data analysis. Further, we applied various quantitative and post-hoc analyses to show validity of our results.
6. **Completeness and logic:** The characteristics were derived following the taxonomy development method according to Nickerson et al. (2013) and proved to be collectively exhaustive. Therefore, we followed a deductive approach to identify distinctive characteristics. The resulting clusters prove internal consistency and comprehensiveness in their inclusion.
7. **Recognizability:** By deriving the taxonomy characteristics from comprehensive literature review and manually verifying the assignment of platforms to the clusters, we are able to ensure that the results mirror reality and by that describe generic archetypes of crowdfunding intermediaries.

## THEORETICAL AND PRACTICAL IMPLICATIONS

To our knowledge, this study is the first to investigate crowdfunding from the perspective of the theories of two-sided markets and financial intermediation theory. Our study provides two important contributions. First, crowdfunding is linked to the theory of two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) and financial intermediation (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). Due to this theory integration, we are able to elaborate on the functions of crowdfunding intermediaries as market makers bridging capital-seeking and capital-giving agents. This presents crowdfunding as digitally transformed model of financial intermediation, which indicates the disruptive potential of crowdfunding in the financial intermediation business. For financial intermediation

theory, these results may help develop a better understanding of how the digital transformation affects financial intermediation. The rise of the internet has generally led to an increase in financial intermediation, despite the fact that transaction costs as well as information asymmetries have decreased (Allen and Santomero 1998). Acting as market makers in two-sided markets by transforming lot sizes, risk, and information, crowdfunding intermediaries seem to extend these developments. However, these functions are pre-dominantly performed by a crowd of internet users, while the digitally transformed crowdfunding intermediaries only provide the infrastructure for the exchange between capital-seeking and -giving agents. Compared to traditional financial intermediaries, a substantial part of the tasks associated with financial intermediation is directly performed by the participating agents themselves and not by the intermediary anymore. For instance, traditional financial intermediaries lend and borrow money on their own account, while crowdfunding intermediaries focus on the matchmaking of the agents. This systematic integration of capital-seeking and -giving agents in the value creation associated with financial intermediation may mitigate the paradox stated by Allen and Santomero (1998). This research proposes the integration of the crowd of internet users as an IT-based shift from in-house problem solving towards market-based problem solving (Afuah and Tucci 2012). Further, our theory also contributes to research on two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) by combining the theory's institutional perspective on market agents with the functional perspective of financial intermediation theory using crowdfunding as an example. Thus, our research enables a more indulgent understanding on how intermediaries in two-sided markets manage exchange relationships between multiple classes of agents.

Second, we provide a systematic and comprehensive taxonomy of crowdfunding intermediaries. The purpose of the taxonomy is to characterize the generic exchange relationships and their influences of the crowdfunding intermediation model. Our empirical taxonomy suggests that there are three archetypes of crowdfunding intermediaries with different value propositions: Hedonism, Altruism, and For Profit. Our taxonomy extends existing classifications of crowdfunding intermediaries by various aspects (Belleflamme et al. 2013; Bradford 2012; Hemer 2011; Massolution 2013). It is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon, instead of taking into account the type of return capital-giving agents receive for their investment only. Our results allow much deeper insights into the phenomenon of crowdfunding and will help systematize and

synthesize research on crowdfunding. Our taxonomy abstracts from single peculiarities of specific crowdfunding intermediaries and projects and by that enables generalizable propositions. Our empirical taxonomy pinpoints three overarching classes of value propositions providing a better understanding of the phenomenon. Taxonomies, which are based on the value proposition of the intermediaries, have been applied successfully to the field of crowdsourcing as well (Geiger et al. 2011; Kaufmann et al. 2011; Rouse 2010). This supports and justifies our approach. For practice, our empirical taxonomy provides a comprehensive overview on the crowdfunding market and different types of crowdfunding intermediaries. For traditional financial intermediaries this taxonomy helps to characterize potential competitors in a new competitive arena and helps them gain a better understanding of the disruptive potential of crowdfunding. These results will gain in importance, particularly when crowdfunding intermediaries will be established more solidly in the mass market as complement (or substitute) for traditional financial intermediaries. Both, the theory integration of crowdfunding in theory of two-sided markets and financial intermediation, as well as the presented taxonomy can serve as starting point in the digital transformation process of traditional financial intermediaries by providing a better understanding and systemization of the value propositions and differentiating characteristics within their business models.

## LIMITATIONS AND FUTURE RESEARCH

While our study is a first approach on developing a theoretically grounded and empirically tested taxonomy of crowdfunding intermediaries, there are some important concerns to our research. First, our sampling procedure was limited to crowdfunding intermediaries with an English or German website. Taking into account intermediaries with websites comprising of other languages might, in principle, produce slightly different clusters. However, the investigated platforms show a broad geographic dispersion, also including a variety of non-English or non-German speaking countries. Further, the USA, UK, and Germany are among the biggest and most mature crowdfunding markets worldwide such that we strongly believe that our results are well generalizable. A second limitation of our study relates to our qualitative data collection effort. While we put high effort in ensuring reliability and validity of our data, using objective platform data might have produced an even more sophisticated assessment of crowdfunding intermediaries. However, many of the characteristics investigated in our study have a dichotomous nature such that it was a deliberate decision to collect all data as dummy variables in order to reduce complexity of the

taxonomy development and cluster analysis. Finally, the crowdfunding industry is highly dynamic with most crowdfunding intermediaries being startups. Also, investment sums have highly increasing funding volumes across the world as the crowdfunding industry matures. As a consequence, models of financial intermediation are constantly evolving in the crowdfunding industry leading to the future development of novel types of crowdfunding. However, we strongly believe that our empirical taxonomy describes stable archetypes of crowdfunding intermediaries that withstand even further increasing industry dynamics. The theoretical grounding of our taxonomy in financial intermediation theory and theory of two-sided markets as well as our categorical data collection both abstract from single peculiarities of crowdfunding intermediaries. They emphasize the basic principles of crowdfunding intermediaries and corresponding exchange relationships between involved agents. Both proved to be stable within the timeframe of this research, whereas financing conditions of crowdfunding intermediaries constantly changed. Researching the fast developing crowdfunding industry may improve our understanding of how digitization and the internet affect and reconfigure existing industries such as the financial service industry. In this regard, our taxonomy may serve as a first step of doing so pinpointing to important avenues for future research. Our taxonomy leads to the assumption that in particular e.g. capital-giving and capital-seeking agents may follow different motivations for supporting crowdfunding projects. Success factors or platform design principles might differ as well and should be further examined. Therefore, we need more extensive research on these topics with respect to the specific differences between the identified crowdfunding archetypes. Additionally, examining the question of which same-side and cross-side effects can be observed in crowdfunding intermediation will help develop a deeper understanding of how crowdfunding actually works and what similarities and differences to other forms of crowd-based approaches exist.

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# 6. PUB 2: HOW DO CROWDFUNDING INTERMEDIARIES PERFORM FINANCIAL INTERMEDIATION? MECHANISMS AND ARCHETYPES

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**Abstract**

Crowdfunding emerged as new way of funding by matchmaking capital givers and seekers. However, traditional financial intermediation theory falls short in explaining how crowdfunding brings demand and supply for capital to equilibriums. We thus develop a system theory of crowdfunding intermediation by unraveling specific mechanisms of crowdfunding intermediation and identifying dominant configurations of them. Following a mixed method approach, we collect data on implemented crowdfunding intermediation mechanisms by content-analyzing 160 crowdfunding intermediaries. We then apply unsupervised and supervised machine learning techniques in order to identify three timely robust archetypes of crowdfunding intermediation – philanthropic, hedonistic, and profit-oriented crowdfunding. This study contributes to crowdfunding literature by proposing a theory of crowdfunding intermediation that unravels the inner workings of crowdfunding intermediaries and reflects a theoretically grounded, empirically validated, and temporally stable taxonomy of crowdfunding intermediaries. Further, it extends financial intermediation theory by improving the understanding of how the Internet disrupts traditional financial intermediation.

**Keywords:** Crowdfunding, Crowdfunding Intermediation, Financial Intermediation, System Theory, Cluster Analysis, Survival Analysis, Alignment

## INTRODUCTION

Emerged from the impact of digitization, platform-based business approaches have affected, threatened, and radically changed traditional industries with start-ups introducing innovative solutions, which deeply impacted today's societies and individuals (Weber 2016). Especially, the financial service industry is facing radical changes, driven by the *fintech* paradigm, where the roles of customers and suppliers become blurry and the value co-creation takes place on multi-sided platforms, which perform the service provision within ecosystems (Rong and Shi 2014; Williamson and De Meyer 2012).

Providing an innovative, platform-based approach in order to perform financial intermediation, crowdfunding has gained large attention recently (Belleflamme et al. 2014; Mollick 2014; Schwienbacher and Larralde 2012). Crowdfunding describes the collective funding of projects by a crowd of capital givers on an intermediary platform (Belleflamme 2014). It may span highly different purposes that range from collecting donations for social projects, (pre-) selling products, to funding start-ups in exchange for profit shares and/or interests (Bradford 2012). While the platform-based crowdfunding intermediaries serve the same purpose such as incumbent financial intermediaries – connecting capital seekers and givers to create thick markets – they exhibit three fundamental differences. (1) Funding decisions and activities are no longer reserved to professional financial institutions (e.g., banks or venture capitalists), but democratized by opening up to every individual with Internet access and the required financial ability (Belleflamme et al. 2014). (2) They provide funding for projects that have limited access to traditional forms of funding due to high investment risk and/or low profitability expectations and that may reflect the long tail of the financial service industry (Liebenau et al. 2014; Schwienbacher and Larralde 2012). Crowdfunding intermediaries make extant use of information technology aiming at serving such projects profitable (e.g., co-creation based on web 2.0 approaches, big data analytics, or process automatization) (Haas et al. 2015). (3) As opposed to traditional financial intermediaries, crowdfunding intermediaries are not involved in the actual funding process. Crowdfunding intermediaries serve as matchmaker by linking capital seekers and givers directly and by enabling them to exchange capital and value for which they provide the technical or organizational infrastructure on an online platform (Liebenau et al. 2014).

These differences exhibit some degree of disintermediation of the actual funding process by directly linking capital seekers and givers. In crowdfunding, however, the intermediary platform still represents an essential instance of the funding process, due to occurring transaction costs and information asymmetries (Bakos 1991; Bakos 1998; Mahadevan 2000). For instance, collecting micropayments from capital givers can reflect an arduous task. Similarly, new approaches for evaluating and controlling "default risks" of long tail projects may be required, particularly when capital seekers may hide or manipulate important information (Ahlers et al. 2015; Burtch et al. 2016). Consequently, crowdfunding intermediaries evolved as new platform-based class of financial intermediaries that have reshaped the way effective financial intermediation is performed with regard to the disruptive challenges caused by the digitization. Existing financial intermediation theory (Allen and Santomero 1998; Diamond 1984) falls short in explaining how crowdfunding platforms perform financial intermediation as it does not take into consideration (1) the high degree of digitization of the business operations; (2) the joint value co-creation in ecosystems; (3) the changed role of the financial intermediary as matchmaker within a multi-sided platform business; and (4) the creation of long tail offerings for niche markets. Considering the diversity of crowdfunding platforms suggests that different archetypes of crowdfunding platforms exist, that represent certain dominant configurations in order to perform effective crowdfunding intermediation within a specific context of use. Thus, these dominant configurations may reflect different instantiations of crowdfunding intermediation. However, research and practice offer a plethora of different conceptualizations of the phenomenon, which hampers our understanding of *how the platform-based crowdfunding intermediaries are configured in order to perform effective financial intermediation*.

In this paper, we intend to answer this crucial question. We develop an explanative system theory of crowdfunding intermediation and discover how crowdfunding intermediaries apply distinct organizational and technical mechanisms for performing effective financial intermediation. We argue that the implementation of these mechanisms results in a system of crowdfunding intermediation, which determines the way of how crowdfunding intermediation is being performed effectively. We illustrate this theory following a mixed method approach. We content analyze a set of 178 crowdfunding intermediaries in order to identify the implemented mechanisms for crowdfunding intermediation. We apply unsupervised (cluster analysis) and supervised (classification tree analysis) machine learning techniques (George et al. 2016) and

identify three temporally stable archetypes of crowdfunding intermediation. First, hedonistic crowdfunding intermediation, which enables the funding of innovative and creative projects by applying a rigid set of funding mechanisms and proposing non-monetary rewards as compensation for capital givers. Second, philanthropic crowdfunding intermediation, which is characterized by relaxed funding mechanisms and that enables raising funds for charitable projects by creating altruistic experiences without any direct compensation for capital givers. Third, profit-oriented crowdfunding intermediation comprises financial compensations for capital givers, which is mostly applied for the funding of start-ups and loans for private consumption. This type includes a rather moderate set of funding mechanisms and mostly performs some sort of due diligence. By analyzing the survival rate of the investigated platforms, we show that a platform's proximity to one of three dominant configurations of intermediation mechanism enhances the platform's effectiveness.

By defining a system theory of crowdfunding intermediation, we provide three important theoretical contributions. First, we contribute to the crowdfunding literature by unraveling the inner workings of crowdfunding and explaining how crowdfunding intermediaries perform financial intermediation by forming effective systems of crowdfunding intermediation mechanisms. Thus, we help to substantiate existing attempts to structure the crowdfunding phenomenon by proposing three theoretically grounded, empirically validated, and timely stable archetypes of crowdfunding intermediaries. Second, we are able to explain the relationship between a platform configuration's proximity to one of the archetypal configurations and its sustainable effectiveness. Third, we extend financial intermediation theory by improving our understanding of how the Internet, the digitization, and the opportunities of innovative information technology reshape traditional financial intermediation (Allen and Santomero 1998; Diamond 1984) and we provide valuable insights in the rise and the maturation of the crowdfunding phenomenon.

The paper proceeds as follows. We start reviewing the literature on crowdfunding and financial intermediation theory. We extend this theory base by unraveling the building mechanisms of our crowdfunding intermediation theory. After presenting our methodology, we then identify dominant archetypes of crowdfunding intermediation and investigate the impact of the platform's configuration on effectiveness. Finally, we discuss these results with regard to their theoretical and practical implications.

## CONCEPTUAL AND THEORETICAL BACKGROUND

### Crowdfunding and Crowdfunding Intermediaries

Belleflamme et al. (2014) define crowdfunding as collective funding by an undefined crowd, where capital seekers (i.e., initiators of crowdfunding projects such as artists, entrepreneurs, etc.) and a crowd of capital givers are directly interlinked via an online crowdfunding intermediary by means of an Internet-based open call. Crowdfunding intermediaries provide an online platform as the point of interaction between capital givers and seekers, a regulatory framework (e.g., standardized contracts (Bradford 2012)), and additional services (e.g., debt collection (Liebenau et al. 2014)).

Most existing crowdfunding research has focused on capital seekers and givers. Research investigated behavioral decision-making patterns of capital givers and seekers, e.g., herding or signaling effects (Agrawal et al. 2010; Burtch et al. 2013b), their motivation (Gerber et al. 2012), their characteristics (Lin et al. 2014; Wang and Greiner 2011), or their roles and activities within crowdfunding projects (Hui et al. 2013; Ordanini et al. 2011). The second main stream of research focuses on crowdfunding projects, e.g., factors that influence the funding success including social and personal networks (Lin et al. 2013), project presentation (Mitra and Gilbert 2014b), or the dynamics of crowdfunding projects (Mollick 2014; Schwienbacher and Larralde 2012). Additionally, certain authors investigated risks associated with crowdfunding (Burtch et al. 2016; Cumming et al. 2016; Siering et al. 2016).

So far, research on crowdfunding intermediation and intermediaries has been largely neglected. Most notably, Tomczak and Brem (2013) conceptualize the process of crowdfunding intermediation. Some researchers emphasized that crowdfunding intermediaries are mainly build on modular service systems (Haas et al. 2015; Hemer 2011; Liebenau et al. 2014). Thus, crowdfunding intermediation can be conceptualized as a bundle of services needed to match capital givers and seekers in a two-sided market (Wei and Lin ; Zvilichovsky et al. 2013). Furthermore, existing research has focused on classifying crowdfunding intermediaries (see Table 9). These first attempts differentiated crowdfunding based on the *legal* relationship between capital givers and seekers (Bradford 2012), the *compensation* for capital givers (Belleflamme et al. 2014; European Commission 2014; Massolution 2013), their *motivation* (Collins and Pierrakis 2012; Hemer 2011), and additional *risk* factors (Beaulieu et al. 2015; Ordanini et al. 2011). Table 9 exhibits that between two and six different types of crowdfunding intermediaries have been proposed.

*Table 9: Classifications of Crowdfunding Intermediaries*

| Author | Focus of Classification | Types of Crowdfunding | Theoretical Foundation & Empirical validation |
|---|---|---|---|
| Belleflamme et al (2014) | Community benefits that increase capital givers' utility | • Pre-Ordering<br>• Profit-Sharing | • Conceptual nature<br>• Theoretical unified model<br>• No empirical validation |
| Bradford (2012) | Legal Relationship based on the offered returns for capital givers | • Donating Model<br>• Reward Model<br>• Pre-Purchase Model<br>• Lending Model<br>• Equity Model | • Conceptual nature<br>• Federal Securities Law<br>• No empirical validation |
| Collins & Pierrakis (2012) | Forms of contributions, returns, and motivations | • Donation Crowdfunding<br>• Reward Crowdfunding<br>• Crowd-funded Lending<br>• Equity Crowd-funding | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| European Commission (2014) | Forms of returns | • Donations<br>• Reward-based<br>• Pre-Sales<br>• Crowdlending<br>• Crowdinvesting | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Hemer et al (2011) | Forms of returns and motivations | • Crowd Donations<br>• Crowd Sponsoring<br>• Crowd Pre-Selling<br>• Crowd Lending<br>• Crowd Equity | • Conceptual nature<br>• No theoretical foundation<br>• Systematic description of 200 crowdfunding platforms |
| Massolution (2013) | Forms of returns | • Donation-based<br>• Reward-based<br>• Lending-based<br>• Equity-based<br>• Royalty-based | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Ordanini et al. (2011) | Risk return ratio and type of consumer involvement | • Music business<br>• Financial services<br>• Context of personal and social services | • Conceptual nature<br>• No theoretical foundation<br>• No empirical validation |
| Beaulieu et al. (2015) | Exchange and risk factors | • Private equity<br>• Royalty<br>• Microfinance | • Conceptual nature<br>• Grounded theory approach |

| | | |
|---|---|---|
| | • Peer-to-peer<br>• Rewards<br>• Donation | • Content analysis of 99 campaigns with regard to 13 characteristics |

These classifications are mostly conceptual in nature and are primarily based on the provided compensation. They are neither theoretically grounded, nor empirically validated. Further, these classifications neglect financial intermediation as core function of crowdfunding intermediaries.

**Financial Intermediation Theory**

A financial intermediary is a middleman in financial transactions, which effectuates more efficient transactions (Lin 2015). Financial intermediaries are ubiquitous and essential institutions in imperfect markets, which are characterized by transaction costs (Benston and Smith 1976; Gurley and Shaw 1966) and information asymmetries (Fama 1980; Leland and Pyle 1977). Financial intermediaries borrow capital from capital givers and lend it to capital seekers by using debt contracts and make profits by asking higher interests from capital seekers than they pay for capital givers (Gorton and Winton 2003). Financial intermediation theory describes the necessity of specialized intermediaries in the resource allocation between capital seekers and givers by transforming (1) lot sizes, (2) risk, (3) information, and (4) maturities (Allen and Santomero 1998; Diamond 1984; Entrop et al. 2015; Fama 1980).

**(1) Lot Size Transformation:** Financial intermediaries balance diverging capital requirements. Therefore, deposits of capital givers are bundled in order to satisfy the capital requirements of capital seekers. Financial intermediaries act as matchmakers by serving capital givers and seekers on own account. In so doing, they provide pooling and payment mechanisms for the capital exchange in order to overcome the boundaries of time, geographies, and industries (Merton 1989).

**(2) Risk Transformation:** Financial transactions contain risks and uncertainties. The expected return for an investment is directly linked to a certain risk expectation (Markowitz 1952). Thus, higher default risks result in higher return expectations. Financial intermediaries balance diverging risk expectations by managing, diversifying, and trading risks among capital seekers and givers. They may act as neutral, trustworthy, objective, and specialized partner for third parties that ensure integrity, veracity, and legal compliance (Bakos 1998; Gorton and Winton 2003; Merton 1989). Due to their experience in assessing investments risks and

corresponding monitoring activities, financial intermediaries are able to reduce risks associated with information asymmetries and avoid free riding behavior of capital givers (Diamond 1984; Gorton and Winton 2003).

**(3) Information Transformation:** Participants in financial markets strive for a better level of information in order to make the "best" investment decisions. However, since only capital seekers possess information about the veracity of their intentions, financial intermediaries reduce information asymmetries by creating, bundling, and providing reliable information, e.g., regarding a capital seeker's creditworthiness (Gorton and Winton 2003; Leland and Pyle 1977; Merton 1989).

**(4) Maturity Transformation:** Financial intermediaries balance different timeframes. This involves borrowing capital on longer timeframes than lending it out (Gambacorta and Mistrulli 2004). As interest rates differ between timeframes (i.e., they are higher for short-term loans than for long-term loans), financial intermediaries create profits and reduce transaction costs by synchronizing timeframes.

Taking a system perspective, financial intermediation theory spans three levels of abstraction. The *transformation functions* represent the basic principles of financial intermediation. A set of organizational and technical *mechanisms* form the building blocks of each of these functions. These mechanisms are context-specific and not every intermediary needs to implement each available mechanism (Diamond 1984; Hellwig 1991). These mechanisms reflect design choices of financial intermediaries regarding their specific intermediation model (e.g., the degree of information production). In turn, single mechanisms can be implemented by means of different *instantiations* (e.g., creating creditworthiness scores or information leaflets in terms of information production).

## THEORY DEVELOPMENT

In order to describe a system theory of crowdfunding intermediation, we follow a system perspective that describes exchange processes between the involved actors. A system theory proposes a paradigm of interacting parts resulting in a system, which represents an entity with its own properties (Boulding 1956; Burton-Jones et al. 2015; Mattessich 2012; Von Bertalanffy 1968). A system theory mainly focuses on giving explanatory insights by interrelating the mechanisms forming the overall system. They result in alternate understandings about *how* things occur and are, thus, suitable for exploring new phenomena (Salmon 1998).

Following financial intermediation theory (Allen and Santomero 1998; Diamond 1984) and existing crowdfunding research that considers crowdfunding intermediaries as service systems (Haas et al. 2015; Liebenau et al. 2014), we conceptualize crowdfunding intermediation as a system of mechanisms that have been chosen and implemented by a crowdfunding intermediary in order to offer a respective type of intermediation. These mechanisms are guiding the interaction and exchange between capital seekers and givers and set the infrastructural boundaries for the process of financial intermediation. Thus, we aim at explaining *how* the different transformation functions of financial intermediation theory are implemented at crowdfunding intermediaries by a set of context-specific mechanisms.

**Lot Size Transformation in Crowdfunding Intermediation**

Lot size transformation in crowdfunding basically involves the pooling of numerous small investments of capital givers in order to fulfill the financial requirement of capital seekers. This is achieved by mechanisms for (1) *specialization*, (2) *funding*, and (3) *compensation*.

**Specialization Mechanism:** As traditional financial intermediaries, crowdfunding intermediaries transform lot sizes by overcoming time, geographies, or industry boundaries in order to satisfy capital seekers and givers. As crowdfunding intermediaries do not borrow and lend on own account and act as matchmakers, they have to create "thick" markets, in which matches between seekers and givers of capital are created (Evans and Schmalensee 2016). As the interests of capital givers and seekers may be highly diverse and heterogeneous, successful matchmaking is based on addressing specialized target groups. Crowdfunding intermediaries try to connect a defined group of capital seekers with an appropriate crowd of capital givers (e.g., start-ups and capital givers making such risky investments). Thus, crowdfunding may provide funding for a broad variety of highly specialized niche markets that have limited access to more traditional sources of finance by making use of self-selection effects of capital seekers and givers (Anderson 2004; Bruton et al. 2015; Harrison 2013; Mollick and Robb 2016). Research has identified four major instantiations of specialization: *creative projects and creative products* (Agrawal et al. 2010), *start-ups and new businesses* (Ahlers et al. 2015; Schwienbacher and Larralde 2012), *private consumption* (Herzenstein et al. 2011; Lin et al. 2013), or *sustainability and social action* (Burtch et al. 2013a; Burtch et al. 2013b).

**Funding Mechanism:** Crowdfunding intermediaries synchronize heterogeneous lot sizes of capital givers (larger amount for project realization) and capital seekers (smaller investments) by pooling funding decisions of capital givers. In this regard, the funding enables the direct exchange between capital seekers and givers and is instantiated by three interrelated parts that define how capital givers can make investments and how the collected funds are paid out to capital seekers. First, *investment levels* and *minimum investments* define funding conditions of capital givers. *Investment levels* define certain compensations for investing different amounts of money. Funding a project, capital givers can choose from these pre-defined *investment levels* (e.g., a "thank you email" for 1 USD, a signed poster for 40 USD, or profit shares for 500 USD). Each investment level might be limited to a certain quantity in order to attract higher investments. Second, a *minimum investment* defines a lowest possible investment sum. For instance, many investments into start-ups are bound to a minimum investment amount in order to prevent too strong dilution effects. Second, the funding mechanism defines the *payout conditions*. These vary between the principles of "all-or-nothing" and "keep-it-all" (Cumming et al. 2014). Applying all-or-nothing, capital seekers are only granted the collected money if their funding goal has been reached, assuming that capital seekers are only able to accomplish their project and to deliver the promised returns in case they have the required resources. By contrast, the keep-it-all-principle allows capital seekers to receive any collected sum (Gerber et al. 2012). Summarizing, funding mechanisms affect and regulate the direct interaction between capital seekers and givers and are instantiated by *investment levels*, *minimum investments,* and *payout conditions* (Gerber et al. 2012; Mitra and Gilbert 2014b; Mollick 2014; Walsh 2014).

**Compensation Mechanism:** The effective matching of the capital requirements of capital seekers and the compensation interests of the capital givers is crucial in crowdfunding intermediation (Belleflamme et al. 2014; Mollick 2014; Schwienbacher and Larralde 2012). In traditional financial intermediation, capital givers are financially compensated by interests that are paid by the financial intermediary (or other types of financial compensation). By contrast, the compensation is directly made by capital seekers in crowdfunding and may also be of non-financial nature. The crowdfunding intermediary provides the infrastructure for exchanging financial and non-financial compensations that aim at delivering five different types of compensation (Bradford 2012; European Commission 2014; Hemer 2011). First, capital givers support projects by means of donations without receiving an actual

compensation such that they are offered an *altruistic experience*. *Rewards* reflect non-financial compensations for capital givers and may include "thank you emails," "gimmicks," and other giveaways for those exchange crowdfunding intermediaries offer a specific infrastructure. Similarly, compensation mechanisms may also comprise *pre-ordered products*. The investment of capital givers can be seen as a pre-payment for a not yet existing product for whose exchange crowdfunding intermediaries resemble a specific type of online shop. By contrast, financial compensation may comprise *interests* or *profit shares*. In the case of interests, capital givers grant loans to capital seekers and receive partial repayments on a regular basis, which also contain interests. In the case of *profit shares,* a participation certificate is issued, which entitles the capital giver to receive a certain profit share. For both types of financial compensation, crowdfunding intermediaries have to install a specific legal model and to build up an infrastructure for enabling capital seekers to make regular payments to capital givers. However, compensations are not mutually exclusive and compensation mechanisms may combine several of them.

**Risk Transformation in Crowdfunding Intermediation**

Risk transformation in crowdfunding is mainly facilitated by means of delegated monitoring.

**Delegated Monitoring Mechanism:** Capital seekers might aim at manipulating their chances of getting successfully funded by glossing over the project description, expected returns, or their skills, thus, exploiting information asymmetries (Herzenstein et al. 2011; Siering et al. 2016; Zhang and Liu 2012). This is of particular concern in crowdfunding as capital givers carry the default risk directly and they are rather inexperienced and casual investors. Thus, crowdfunding comprises a significant level of uncertainty and risk for them (Cumming et al. 2016; Robock 2014). Providing delegated monitoring, crowdfunding intermediaries ensure integrity, veracity, and legal compliance. Crowdfunding intermediaries implement delegated monitoring most prevalently by requiring capital seekers projects' to pass a *feasibility assessment* or a more sophisticated *due diligence*. Feasibility assessments may include the presentation of feasibility studies or working prototypes before the projects are broadcasted by the crowdfunding intermediary. Feasibility assessments usually focus on the availability of skills and resources in order to accomplish the presented project. After a positive assessment, the results are provided to interested capital givers (e.g., in form of scores or business plans) in order to enable them to assess the risk return ratio (De Buysere et al. 2012; Rechtman and O'Callaghan 2014). In a more sophisticated process, capital

seekers and their projects have to undergo some sort of due diligence. This may comprise the intense evaluation of the capital seekers' default risk based on the analysis of, e.g., income statements or projected cash flows. Additionally, behavioral online data, e.g., prior visited websites, may influence the capital seeker's risk assessment (Bradford 2012; Haas et al. 2015). The due diligence results in certain risk scores, indicating default risks, which determine potential compensations (e.g., interest rates).

**Information Transformation in Crowdfunding Intermediation**

Crowdfunding intermediaries transform and reduce information asymmetries between capital seekers and givers by implementing mechanisms for information provision and communication.

**Information Provision Mechanism:** In order to perform information transformation, crowdfunding intermediaries aim at satisfying the need for trustworthy information of capital seekers. Acting as information providers, crowdfunding intermediaries produce, bundle, and distribute information in order to reduce information asymmetries (Fama 1985; James 1987; Kane and Burton 1965; Merton 1989). In contrast to traditional financial intermediation, the signaling efforts of capital seekers are directed directly to the capital givers. Therefore, crowdfunding intermediaries may implement an information provision mechanism, which provides trustworthy information regarding the project. Information provision may be achieved by four different instantiations. Usually, capital seekers have to provide a comprehensive *project description* that provides all necessary information for getting a comprehensive overview about the project and the initiating capital seeker. Further, capital seekers are encouraged to provide *videos and pictures* in order to provide additional information that should aim at addressing emotional and hedonic feelings of capital givers and at providing a better personal impression of the capital seeker (Beaulieu et al. 2015). Additional, *background information about the capital seeker* (e.g., résumés or financial statements) may provide a more fine-grained perspective for capital givers. Finally, the *funding history* of already invested capital givers is frequently provided as this signals credibility and investment quality.

**Communication Mechanism:** In crowdfunding intermediation, information transformation is not limited to a static project description. As crowdfunding projects are dynamic, capital givers have to be informed continuously in order to keep them interested, satisfied, and engaged (Mollick 2014; Ordanini et al. 2011).

Communication mechanisms in crowdfunding intermediation mostly reflect a many-to-many relationship enabling capital seekers to form a trusted relationship with capital givers and to interconnect capital givers directly. Such communication mechanisms allow capital seekers to continuously provide new information about the project and funding progress or updates regarding the offered compensations (Beaulieu et al. 2015). Ongoing communication generates trust and emotional ties between capital givers and seekers, because it satisfies the capital givers' desire to participate in the project (Ahlers et al. 2015; Ordanini et al. 2011; Thies et al. 2016). Thus, a direct *communication function* (Beaulieu et al. 2015; Moritz et al. 2015) enables crowdfunding intermediaries to transform information asymmetries by enabling direct flows of information from capital seekers directly to capital givers and vice versa.

**Maturity Transformation in Crowdfunding Intermediation**

Maturity transformation aims at synchronizing different expectations of capital seekers and givers regarding timeframes for lending and borrowing capital on the intermediaries own account (Gambacorta and Mistrulli 2004). As crowdfunding intermediation aims at the direct peer-to-peer matchmaking of capital givers and seekers with homogenous expectations with regard to timeframes, maturity transformation does not take place in crowdfunding intermediation.

**Summary**

Our theoretical analysis shows that crowdfunding intermediation directly links capital seekers and givers by transforming lot sizes, risks, and information via the implementation of different context-specific and IT-enabled intermediation mechanisms (see Figure 11). Further, we identified six mechanisms that put these transformation functions into action and shape how crowdfunding intermediation takes place (see Table 10).

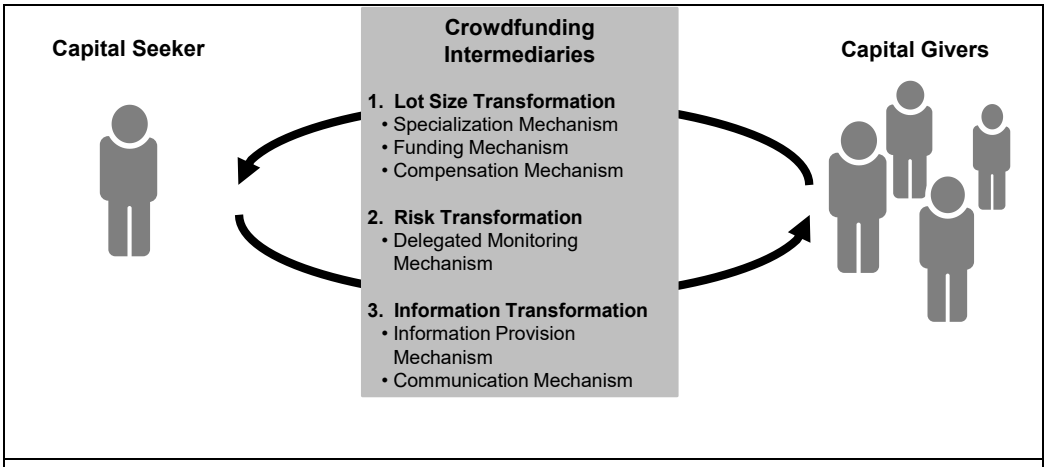


***Figure 11: Crowdfunding Intermediation***

*Table 10: Mechanisms of Crowdfunding Intermediation*

| Transformation Function | Underlying Mechanism | Instantiations |
|---|---|---|
| Lot size Transformation | Specialization | • *Creative projects and creative products*<br>• *Start-ups and new businesses*<br>• *Private consumption*<br>• *Sustainability and social action* |
| | Funding | • *Investment levels*<br>• *Minimum Investments*<br>• *All-or-nothing- / keep-it-all-principle* |
| | Compensation | • *Altruistic experience*<br>• *Rewards*<br>• *Pre-ordered products*<br>• *Interests*<br>• *Profit shares* |
| Risk Transformation | Delegated Monitoring | • *Due diligence, creditworthiness checks*<br>• *Feasibility assessments* |
| Information Transformation | Information Providing | • *Description*<br>• *Videos* and *pictures*<br>• *Background information about capital seeker*<br>• *Funding history of capital giver* |
| | Communication | • *Communication function* |

## HYPOTHESIS DEVELOPMENT

So far, our theoretical analysis has helped us to unravel the central building blocks of crowdfunding intermediation in the form of six mechanisms of crowdfunding intermediation and a total of 19 instantiations. These insights are grounded by the principles of the theory of financial intermediation (Diamond 1984; Benston 1976; Allen 1998). Following this grounding, the respective bundling of these mechanisms within an intermediary system is subject to choice and performs the transformation functions of traditional financial intermediation (Liebenau 2014). Therefore, crowdfunding intermediation is able to address various areas of application, ranging from collecting donations to the funding of loans (Bradford 2012), and thereby addresses the emerged challenges of multi-sided and digitally transformed financial markets (Yum 2012).

These heterogeneous contexts of application demand highly differentiating competences in order to perform effective crowdfunding intermediation. In order to meet the rigidity, objectives, and functioning of the different contexts of application,

these mechanisms cannot be bundled freely but may be related to each other. Thus, the selective bundling of the identified mechanisms into a respective system of crowdfunding intermediation is necessary in order to perform effective crowdfunding intermediation within a certain context. Following this line of reasoning, unraveling the relationships between these mechanisms, may lead to the identification of a set of dominant configurations of how these intermediation mechanisms are implemented.

These dominant configurations represent archetypal bundles in order to perform effective financial intermediation with regard to a specific context of application. Therefore, the proximity of a crowdfunding platform to the respective, context specific dominant configuration may lead to higher effectiveness. According to previous research the effectiveness of a strategic options leads to a higher probability of market survival (Bayus 2007). Following this thought, we argue that this is also the case for crowdfunding. Due to the high competition of the crowdfunding market, a lack of the ability to perform effective financial intermediation, inevitable leads to a loss of both customer markets – capital givers and capital seekers. . Therefore, a crowdfunding platform, which is not able to perform effective financial intermediation will be more likely to die. Following this line of reasoning a hypothesis can be formulated as:

*H1: Platforms with higher proximity to a context specific dominant configuration, are more likely to survive.*

## METHODOLOGY

The identified intermediation mechanisms and their instantiations represent fine-grained, observable, and distinctive characteristics, which allow for comparison between the crowdfunding intermediaries and configurational analysis (McKelvey 1982; Rich 1992). However, for taking a system's perspective on crowdfunding intermediation, it is not sufficient to consider single building blocks separately, but rather to analyze their interaction within the system (Ackoff 1971). Therefore, we apply a mixed method approach in which we first collect data by content-analyzing 178 crowdfunding intermediaries in order to unravel how these instantiations are implemented. We first identify archetypes of crowdfunding intermediation by applying cluster analysis that are based on dominant configurations of intermediation mechanisms. As a second step, we analyze of how the platform configuration's proximity to one of the derived archetypal configurations impacts the sustainable effectiveness of the crowdfunding intermediation by investigating the platform's survival rates.

## Data Collection

In total, we collected data on 178 crowdfunding intermediaries in three independent rounds of data collection in order to identify the dominant configuration patterns and to assess the temporal stability of our clustering results. The first round of data collection took place from October 2012 till December 2013. We initially identified over 500 crowdfunding intermediaries via an online search. We only considered crowdfunding intermediaries for the following analysis if they met three criterions: (1) An active, working and publicly accessible website in order to ensure reliable and transparent data access; (2) English or German language as the USA, UK, and Germany are among the biggest and most mature crowdfunding markets worldwide; (3) track record of business operations (i.e., history of successfully funded projects) in order to ensure the actual viability of the crowdfunding intermediation. These criteria applied to 127 crowdfunding intermediaries, which were used for a first round of analysis. Based on the six mechanisms of crowdfunding intermediation and their 19 instantiations, a coding scheme for content analyzing the crowdfunding intermediation system was developed (see Appendix). All intermediaries were then content analyzed by the first author using the coding scheme. The second round of data collection was conducted from March till June 2016. Applying the same search criterions as in round one, led us to identify 88 new crowdfunding intermediaries. Within a third round of data collection in July till August 2017, we reevaluated the previous data with regard to the coding and we additionally investigated the date of market entry and (when applicable) market exit. Thus, in total 178 crowdfunding intermediaries were considered for identifying the dominant patterns. In order to ensure intercoder-reliability of the collected data, a second researcher re-coded about 30% of the collected data. Thus, a random subsample of 48 crowdfunding intermediaries was analyzed. A Cohen's Kappa value of 0.69 indicates substantial agreement (Landis and Koch 1977).

## Variables

### *Cluster Variables: Design choices for Crowdfunding Intermediation Model*

Our central study variables are reflected by 19 dichotomous variables representing the different instantiations of the crowdfunding intermediation mechanisms. These variables indicated whether a certain instantiation is implemented by a crowdfunding intermediary or not (0 = no implementation, 1 = implementation). Table 11 shows the descriptive statistics.

*Table 11: Descriptive Analysis*

| Instantiations | Min | Mean | Max | Standard Deviation |
|---|---|---|---|---|
| Creative Projects & Products | 0 | 0.32 | 1 | 0.47 |
| Start-ups & New Businesses | 0 | 0.34 | 1 | 0.47 |
| Private Consumption | 0 | 0.12 | 1 | 0.33 |
| Sustainability & Social Action | 0 | 0.41 | 1 | 0.49 |
| Investment Levels | 0 | 0.51 | 1 | 0.50 |
| Minimum Investments | 0 | 0.71 | 1 | 0.45 |
| All-or-Nothing Principle | 0 | 0.55 | 1 | 0.50 |
| Altruistic experience | 0 | 0.41 | 1 | 0.49 |
| Rewards | 0 | 0.39 | 1 | 0.49 |
| Pre-ordered Products | 0 | 0.06 | 1 | 0.24 |
| Interests | 0 | 0.14 | 1 | 0.35 |
| Profit Shares | 0 | 0.22 | 1 | 0.42 |
| Due Diligence & Creditworthiness Checks | 0 | 0.29 | 1 | 0.45 |
| Feasibility Assessments | 0 | 0.29 | 1 | 0.46 |
| Project Description | 0 | 0.98 | 1 | 0.14 |
| Videos and Pictures | 0 | 0.92 | 1 | 0.27 |
| Background Information about Capital Seeker | 0 | 0.74 | 1 | 0.44 |
| Funding History | 0 | 0.70 | 1 | 0.46 |
| Communication Function | 0 | 0.69 | 1 | 0.46 |

***Alignment of Crowdfunding Intermediation Model***

We conceptualized the alignment of a crowdfunding intermediary's intermediation model by determining its deviation from its relevant archetype. In greater detail, we calculated the distance of each crowdfunding intermediary to the average representative of the cluster with which a crowdfunding intermediary is associated with. For determining these measures of alignment, we used the following schematic algorithm:

1. We determined the cluster membership for each crowdfunding intermediary.

2. We determined the crowdfunding intermediary that reflects the archetypical crowdfunding intermediary for each cluster (i.e., the average representative or the "centroid" for each cluster).

3. We calculated the distance between each crowdfunding intermediary and its respective archetypical crowdfunding intermediary using the distance measures

that has been used within the cluster analysis in order to obtain the original clustering.

4. We rescaled the obtained distance measures in order to increase the interpretability of our results. We divided the obtained distances by the absolute distances between the two intermediaries. Consequently, the rescaled distances reflect multiples of the average incremental increase in distance when one design choice is made that diverges from the relevant archetypical intermediation model.

***Effectiveness of Crowdfunding Intermediation***

In line with existing research that frequently conceptualizes the effectiveness of different strategic options as firm survival on the market (Bayus 2007), we operationalize the effectiveness of different crowdfunding intermediation models as the survival of the crowdfunding intermediary operating a given intermediation model. In greater detail, we collected data on the crowdfunding intermediaries survival including the year of market entry (i.e., the year the crowdfunding intermediary was founded or started to provide crowdfunding services) and if applicable the market exit (i.e., the liquidation of the crowdfunding intermediary or termination of the crowdfunding business). Based on this data we created two variables. The number of survived years in the crowdfunding market and a market survival dummy (0 = crowdfunding intermediary has left market, 1 = crowfunding intermediary is still active).

**Cluster Analysis: Identifying Archetypes of Crowdfunding Intermediation Models**

Cluster analyses group entities such that the in-group variation is small in relation to inter-group variation (Malhotra et al. 2005). By defining distinctive variables (i.e., instantiations of mechanisms), cluster analysis groups entities (i.e., crowdfunding intermediaries) according to their reciprocal similarities and distances describing natural groups (Leisch 2006; Rendón et al. 2011). Although there are different clustering techniques, all of them share the idea that similarities/distances between entities are determined and that these metrics are used to group entities into homogenous groups (Leisch 2006; Rendón et al. 2011).

In order to avoid idiosyncratic errors specific to a certain clustering technique, we used different cluster algorithms applying distinct similarity and distance metrics. In particular, we used Ward's algorithm and K-Means clustering as they produce accurate

clusterings with smaller data sets (Gong and Richman 1995), are able to deal with dichotomous data (Finch 2005; Leisch 2006), and are widespread clustering techniques (Malhotra et al. 2005; Provost and Fawcett 2013). Ward's algorithm is a hierarchical-agglomerative approach, recursively grouping entities according to the smallest distances or biggest similarities. We used Ward's algorithm with Hamming and Jaccard Distances as well as Cosine Similarities that are suited for dichotomous data (Finch 2005). Second, we applied different variations of K-Means clustering[13] that are robust for clustering dichotomous data. In greater detail, we used Spherical K-Means using Cosine Similarity (Foreman 2013; Hornik et al. 2012), K-Medians using Hamming Distance (Foreman 2013; Leisch 2006), and a numeric optimization approach using Jaccard Distance (Leisch 2006).[14] The basic idea of these algorithms is to randomly assign entities to a pre-defined number of clusters (k) and then reassign entities to the closest average representative of that cluster in an iterative fashion.

Determining an appropriate number of clusters, we applied two measures reflecting the quality of clustering that are accurate for K-Means algorithms (Rendón et al. 2011). First, we calculated the Davies-Bouldin-Index that measures the compactness of clusters (i.e., closeness of entities within a cluster) while also taking into account their separation (i.e., distinctiveness of different clusters) (Harikumar and Surya 2015). Second, we calculate the Dunn-Index that reflects the ratio between the smallest distance within and the largest distance across all clusters (Rendón et al. 2011).

**Survival Analysis: Evaluating Effectiveness of Archetypical Crowdfunding Intermediation Models**

In order to test the effectiveness of these archetypical configurations of crowdfunding intermediation, we estimate the effect of each crowdfunding intermediation model's alignment (i.e., the deviation from the relevant archetype) on the years elapsed until the respective intermediary has terminated its crowdfunding business. Thus, surviving years in the crowdfunding business reflects our dependent variable. However, this variable is right-censored as we can determine termination of crowdfunding business only for crowdfunding intermediaries that have actually terminated their business in the past; for intermediaries that are still active this data is not available. Thus, we employed Cox proportional hazard regression to estimate whether a crowdfunding intermediary would terminate its crowdfunding business. This approach estimates the

[13] Standard K-Means clustering requires numerical data.

[14] We use the most frequently applied combinations of clustering algorithms and similarity/distance measures for these approaches. Not every algorithm can work with all similarity/distance measures.

hazard rate for each crowdfunding intermediary that reflect the probability that a crowdfunding intermediary terminates its business at time t given the intermediary is at risk (i.e., it is still in the risk set of survived intermediaries). Equation 1 (Eq.1) shows the hazard rate for the $i^{th}$ crowdfunding intermediary where βx is estimated in the regression model.

$$h(t|x_i) = h_0(t)\exp(x_i\beta_x) \qquad (Eq.1)$$

The β coefficients of the Cox proportional hazard regression can be interpreted as the change of the hazard rate for a one unit change in the underlying variable.

## RESULTS

### Cluster Analysis

All clusterings and calculations have been done with the *R* language and environment for statistical computing.[15] The cluster analysis indicates a robust three cluster solution that can be clearly interpreted (see Figure 12 and Figure 13). For the clustering solutions produced by Ward's algorithm, we also inspected dendograms that also indicate a three cluster solution.

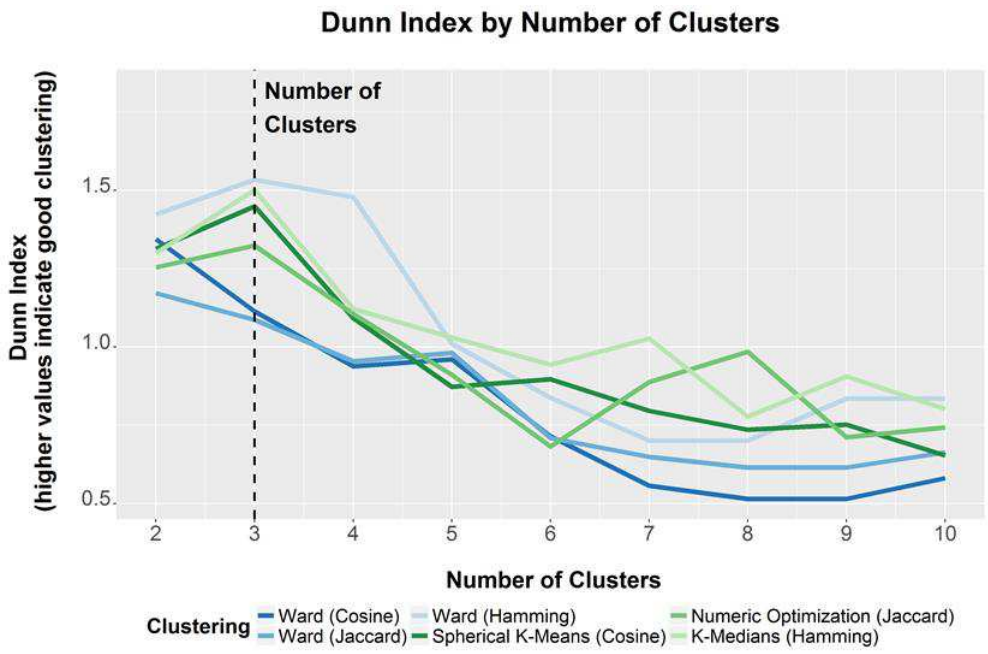


**Figure 12: Dunn-Index by Number of Clusters**

[15] We used the R packages "skmeans" (Hornik et al. 2016), "flexclust" (Leisch and Dimitriadou 2013), "cluster" (Maechler et al. 2016), "clusterSim" (Walesiak and Dudek 2015), and "fpc" (Henning 2016)

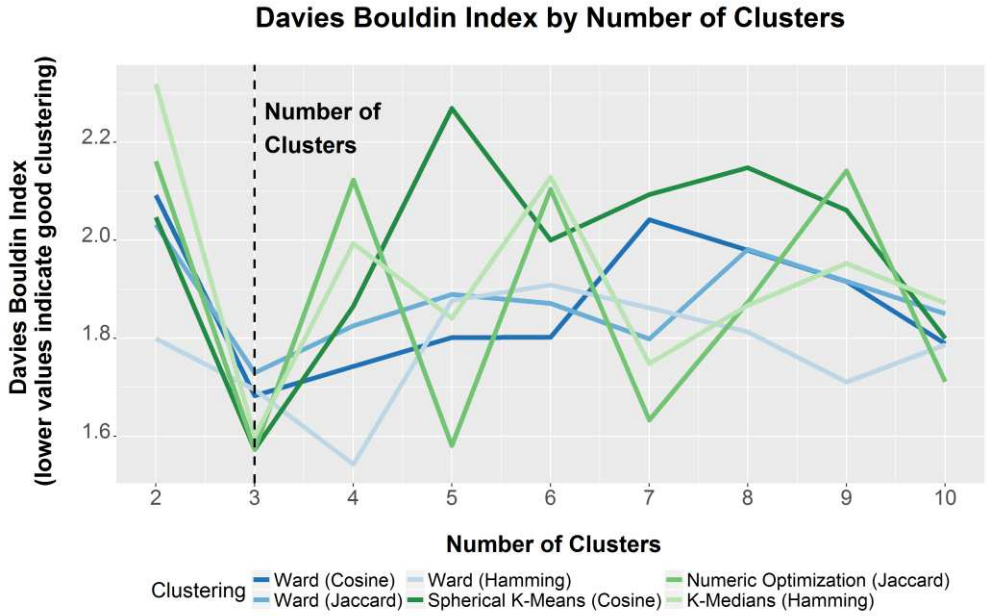


**Figure 13: Davies-Bouldin-Index by Number of Clusters**

Table 12 exhibits that all clustering approaches produce similar results, i.e., there is an average agreement of 91.6% between the different clustering approaches. This agreement is backed by Cramer V's indicating high inter-correlation between the nominal clusterings that are statistically significant ($p < 0.01$) and range between 0.84 and 0.95 (1 reflects identical clustering).

***Table 12: Associations and Agreement between Clusters***

| | **Cramer-V (Chi-Square)** | | | | | **Percent Agreement** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Clustering** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
| (1) Ward (Cosine) | | | | | | | | | | |
| (2) Ward (Hamming) | 0.84*** | | | | | 0.88 | | | | |
| (3) Ward (Jaccard) | 0.95*** | 0.85*** | | | | 0.97 | 0.88 | | | |
| (4) SKMeans (Cosine) | 0.86*** | 0.87*** | 0.83*** | | | 0.91 | 0.91 | 0.88 | | |
| (5) KMedians (Hamming) | 0.88*** | 0.92*** | 0.86*** | 0.93*** | | 0.91 | 0.94 | 0.90 | 0.96 | |
| (6) NumericOptimization (Jaccard) | 0.87*** | 0.86*** | 0.84*** | 0.94*** | 0.92*** | 0.91 | 0.90 | 0.89 | 0.96 | 0.94 |

For our main analysis, we report results for the Spherical K-Means clustering using Cosine Similarity only. Based on our theoretical considerations, the implementation of a given intermediation mechanism reflects a conscious design decision performed by a crowdfunding intermediary in order to perform financial intermediation. Following this line of reasoning, Cosine Similarity has the conceptual beauty that it is an asymmetrical similarity measure and thus takes into account such conscious design decisions only (Foreman 2013). By contrast, other applicable similarity and distance measures such as Hamming Distance also take into account non-implemented intermediation mechanisms for which we cannot infer conscious design. After validating the cluster structure, we conducted descriptive analysis using cross tabulation and contingency analysis to characterize the clusters. As the cluster variables indicated the attribution of crowdfunding intermediaries to the clusters were nominal, we calculated Cramer V's to test whether or not the cluster variables significantly differ across clusters. We analyzed global differences across all three clusters and then applied post-hoc tests, comparing single clusters. In order to ensure that the analysis represents a realistic picture of crowdfunding intermediaries, the assignment of intermediaries to clusters was manually verified for plausibility (Malhotra et al. 2005). Table 13 gives an overview of the cluster results, indicating that our theoretically derived intermediation mechanisms significantly differ among obtained clusters.

***Table 13: Results of the Crosstab Analysis***

| **Variables** | **Cluster 1: Profit-Oriented** | **Cluster 2: Philan-tropic** | **Cluster 3: Hedonic** | **Cramer V** | **Cluster 1 vs. 3** | **Cluster 2 vs. 3** | **Cluster 1 vs. 2** |
|---|---|---|---|---|---|---|---|
| **N** | **42** | **57** | **61** | | | | |
| Creative Projects & Products | 7.14 | 5.26 | 73.77 | 0.71*** | 1-3*** | 2-3*** | 1-2 |
| Start-ups & New Businesses | 83.33 | 1.75 | 29.51 | 0.67*** | 1-3*** | 2-3*** | 1-2*** |
| Private Consumption | 26.19 | 8.77 | 6.56 | 0.25*** | 1-3*** | 2-3 | 1-2** |
| Sustainability & Social Action | 9.52 | 89.47 | 16.39 | 0.74*** | 1-3 | 2-3*** | 1-2*** |
| Investment Levels | 19.05 | 28.07 | 93.44 | 0.68*** | 1-3*** | 2-3*** | 1-2 |
| Minimum Investments | 100 | 57.89 | 63.93 | 0.38*** | 1-3*** | 2-3 | 1-2*** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| All-or-Nothing Principle | 66.67 | 22.81 | 77.05 | 0.49*** | 1-3 | 2-3*** | 1-2*** |
| Altruistic experience | 4.76 | 91.23 | 18.03 | 0.77*** | 1-3* | 2-3*** | 1-2*** |
| Reward | 4.76 | 5.26 | 95.08 | 0.9*** | 1-3*** | 2-3*** | 1-2 |
| Pre-ordered Products | 4.76 | 1.75 | 11.48 | 0.18* | 1-3 | 2-3* | 1-2 |
| Interests | 42.86 | 7.02 | 0 | 0.51*** | 1-3*** | 2-3 | 1-2*** |
| Profit Shares | 69.05 | 1.75 | 9.84 | 0.67*** | 1-3*** | 2-3 | 1-2*** |
| Due Diligence & Creditworthiness Checks | 92.86 | 7.02 | 4.92 | 0.85*** | 1-3*** | 2-3 | 1-2*** |
| Feasibility Assessments | 2.38 | 29.82 | 47.54 | 0.39*** | 1-3*** | 2-3 | 1-2 |
| Project Description | 92.86 | 100 | 100 | 0.23*** | 1-3 | 2-3 | 1-2 |
| Videos and Pictures | 76.19 | 96.49 | 98.36 | 0.34*** | 1-3*** | 2-3 | 1-2*** |
| Background Information about Capital Seeker | 71.43 | 66.67 | 83.61 | 0.17* | 1-3 | 2-3** | 1-2 |
| Funding History | 47.62 | 75.44 | 80.33 | 0.29*** | 1-3*** | 2-3 | 1-2*** |
| Communication Function | 50 | 66.67 | 85.25 | 0.3*** | 1-3*** | 2-3** | 1-2 |

The identified clusters represent dominant configurations of the constituting crowdfunding intermediation mechanisms. Thus, the identified archetypes illustrate how these constituting mechanisms are bundled into systems in order to perform crowdfunding intermediation.

***Archetype 1: Profit-Oriented Crowdfunding Intermediation***

The first archetype focuses on profit-oriented crowdfunding intermediation. With regard to lot size transformation this archetype mainly specializes on *start-ups and new businesses*. Also, the funding of *private consumption* can be assigned to this archetype. Profit-oriented crowdfunding intermediation predominantly implements financial compensations such as *profit shares* or *interests*. Funding mechanisms are designed in a rather moderate way. Therefore, most frequently, *minimum investments* are implemented in conjecture with the *all-or-nothing principle*. By contrast, *investment levels* are hardly implemented. Thus, this funding mechanism primarily

gears at preventing a too complex co-owner structure of capital givers, while also taking care that capital seekers have the requested financial resources in order to satisfy the return expectations of capital givers. As sharing future financial returns embodies a considerable investment risks for capital givers, due to higher sums and the possibility of a total loss, both areas are subject to special legal regulation. Thus, risk transformation is crucial in profit-oriented crowdfunding intermediation. Rigid *due diligence checks* are implemented in order to evaluate default risks of projects. The same is true for information transformation. As participation of capital givers aims at generating profits, crowdfunding intermediaries provide comprehensive information helping capital givers to make investment decisions. Thus, textual *project descriptions* of the investment opportunity, *video and pictures* further improving the understanding of the project, as well as *background information about the capital seeker* and *funding histories of the capital givers* are usually implemented. Also, many crowdfunding intermediaries offer *communication functions*. Typical examples for this archetype include *FundedByMe*[16] or *LendingClub*[17].

***Archetype 2: Philanthropic Crowdfunding Intermediation***

The second archetype performs a philanthropic form of crowdfunding intermediation, where capital givers predominantly support crowdfunding projects by donations. By supporting projects in philanthropic crowdfunding intermediation capital givers are provided with an *altruistic experience*. Thus, philanthropic crowdfunding intermediaries mostly specialize on *sustainability and social action*. Due to the nature of these projects and the absence of direct compensation, funding mechanisms are designed to be very relaxed by setting no entry hurdles in order to support the benevolent fundraising. Therefore, mostly the *keep-it-all-principle* is implemented such that capital seekers receive any collected sum no matter whether the intended funding threshold was reached. Consequently, *investment levels* are not implemented in order to avoid donation barriers. However, *minimum investments* are quite common as capital givers are encouraged to donate higher sums. Due to lower investment sums and the philanthropic orientation risk transformation plays a tangential role such that delegated monitoring mechanisms are implemented rather occasionally. However, information providing plays a crucial role in order to advert for the greater good. Therefore, especially comprehensive *project descriptions* as well as vivid *videos and images* are applied. *Background information about the capital seeker*, *funding*

[16] https://www.fundedbyme.com/
[17] https://www.lendingclub.com/

*histories of capital givers*, as well as a *communication function* are commonly implemented in order to encourage capital givers to invest higher sums and spread the word. An exemplary intermediary for applying philanthropic crowdfunding intermediation is *Crowdrise*[18].

***Archetype 3: Hedonistic Crowdfunding Intermediation***

The third archetype has a rather hedonistic character. Lot size transformation is primarily performed by specializing on *creative projects and products*, where capital givers mainly receive non-monetary *rewards* or *pre-ordered products* as compensation. Hedonistic crowdfunding intermediation encourages capital seekers to address capital givers' sense of interest, desire, or joy. In so doing, these projects create hedonic value for capital givers. Therefore, both the information providing and communication mechanism are broadly implemented in order to enable quick and comprehensive information transformation. Thus, the implementation of *project descriptions, videos and pictures, background information about capital seeker, funding history of the capital giver,* and *communication functions* are prevalent in hedonistic crowdfunding intermediation. Funding mechanisms are designed quite rigid. The *all-or-nothing principle*, *investment levels*, and *minimum investments* aim at increasing the probability of funding by pushing capital givers to invest higher amounts as they only receive their desired reward in the case of funding success. Additional, proofs of concept in form of *feasibility assessments* are mostly required in hedonistic crowdfunding intermediation in order to transform risks. A prominent example for hedonistic crowdfunding intermediation is *Kickstarter*[19].

**Survival Analysis: Effectiveness of Crowdfunding Intermediation Models**

The unconditional Kaplan–Meier survival estimates in Figure 14 suggest that the ten-year survival rate of crowdfunding intermediaries is about 78% across all types of crowdfunding intermediation. In total, profit-oriented crowdfunding intermediaries show the highest survival rates although they are only slightly higher than the average baseline. Interestingly, hedonistic crowdfunding intermediaries show the smallest ten-year survival rates with about 68%.

[18] http://www.crowdrise.com/
[19] https://www.kickstarter.com/

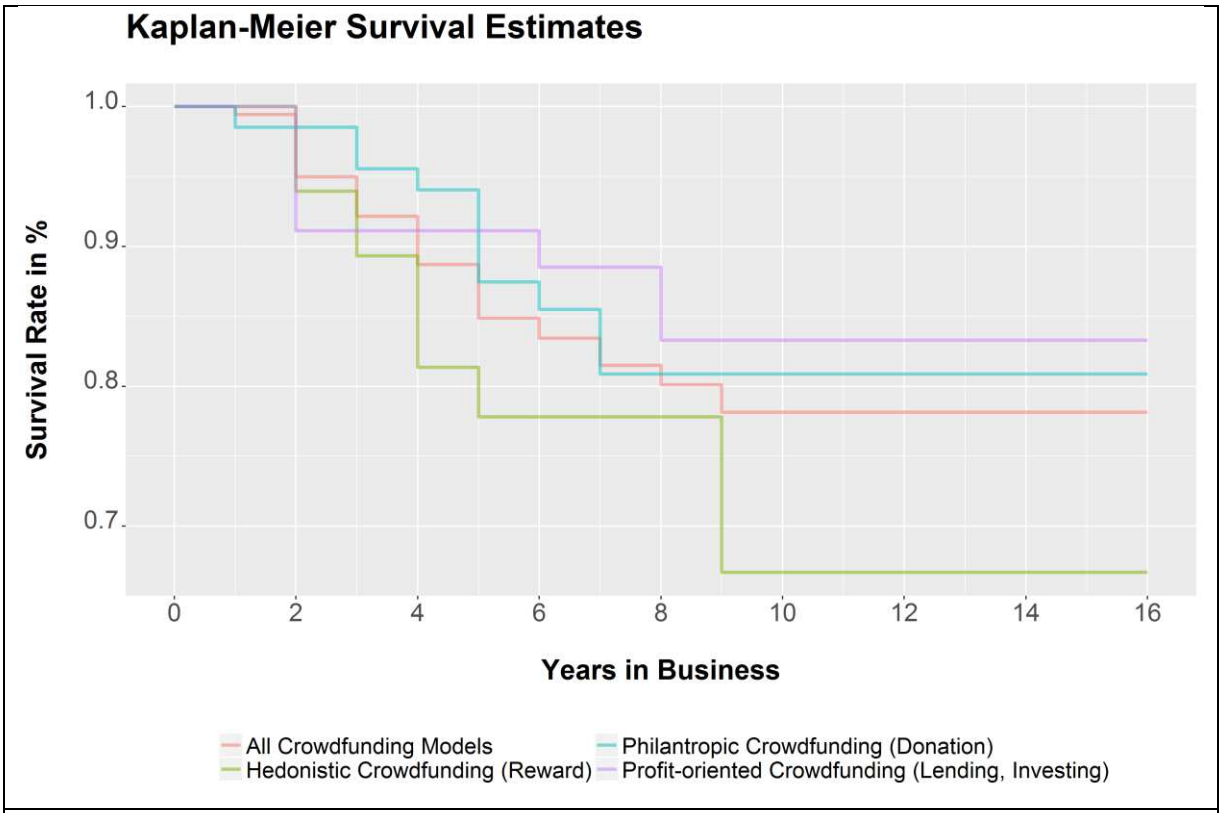


***Figure 14: Kaplan-Meier Survival Estimates***

Table 14 shows the results of the Cox proportional hazard regressions predicting the effectiveness of crowdfunding intermediation, i.e., the years in business before a crowdfunding intermediary terminates its business. Model 1 reflects a baseline model with which we estimate the impact of cluster membership on the years elapsed until the termination of the crowdfunding business. For this purpose, we modeled cluster membership as two dummy variables for cluster 1 and cluster 2.[20] In Model 2, we add the year of market entry as control. In model, Model 3 we add our alignment variable. Model 4 basically reflects a variation of Model 3 in which cluster memberships is modeled as robust sandwich variance estimators. Using such clustered standard errors we can account for the variation within the three clusters. Again, we report results for spherical k-means algorithm only; results for the other clustering approaches lead to highly comparable results. As additional robustness check, we also verified that rerunning the analysis with aggregating the alignment variables that have been obtained by the different clustering approaches lead to similar results. It was verified that hazard rates are constant across all models and measures.

[20] A categorical variable with three levels is represented by two dummy variables. For more details see Aiken et al. (1995)

Model1 and Model2 show that there is no significant effect of cluster membership on survival time. Model 3 and Model 4 suggest that there is a positive and significant effect of a crowdfunding intermediation model's alignment on the years elapsed until a crowdfunding intermediary terminates its business. When using clustered standard errors there is also a positive and significant effect of the year of market entry. Obtained hazard rates for alignment indicate that each design choice that diverges from the archetypical crowdfunding intermediation model increases the likelihood of terminating the crowdfunding business by 8% (exp(0.08)). An even bigger effect can be found for the year of market entry – each year of having entered the crowdfunding business later increases the likelihood of termination by 15% (exp(0.14)). Thus, hypothesis 1 – "*Platforms with higher proximity to a context specific dominant configuration, are more likely to survive"* – can be accepted.

***Table 14: Cox proportional hazard regressions***

| Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Alignment | | | 0.09* | 0.08*** |
| Controls | | | | |
| Birth | | 0.09 | 0.11 | 0.14*** |
| Membership Cluster 1 | -0.66 | -0.59 | -0.66 | Yes[a] |
| Membership Cluster 2 | -0.49 | -0.38 | -0.49 | |
| Wald $\chi^2$ | 2.52 | 4 | 6.75 | 139.9 |

N = 179, Number of failures (crowdfunding intermediaries terminating the business) = 32, Time at Risk = 219991 for all models.
* p < 0.1; *** p < 0.01
[a] Used for creating clustered standard errors

## CONCLUSION

This study presents crowdfunding as platform-based and digitally transformed financial intermediation by developing a system theory of crowdfunding intermediation. Based on financial intermediation theory, we identified six mostly IT-enabled mechanisms and corresponding instantiations. The instantiations' selective implementation within a system shapes the way of how crowdfunding intermediaries perform financial intermediation. Applying unsupervised (cluster analysis) machine learning techniques (George et al. 2016), we identify the three archetypal configuration patterns of profit-oriented, philanthropic, and hedonistic crowdfunding intermediation that have shown to be highly robust and temporal stable. By conducting survival analyses, we are able to show that the alignment of the crowdfunding

intermediaries' system configuration to one of the respective archetypes increases its effectiveness. Therefore, our derived hypothesis can be accepted.

**Theoretical Implications**

This study makes four major contributions to research by proposing a system theory of crowdfunding intermediation that describes how crowdfunding intermediaries perform financial intermediation (Table 15 gives an overview over crowdfunding intermediation theory). Our contributions provide valuable insights for an in depth understanding about the inner workings of crowdfunding intermediation as well as a holistic view on the crowdfunding intermediary and the innovative field of crowdfunding.

First, we extend existing crowdfunding literature that has primarily investigated characteristics and motivations of capital seekers and givers (Burtch et al. 2013b; Burtch et al. 2016; Ordanini et al. 2011) and factors influencing the successful funding of projects (Ahlers et al. 2015; Mollick 2014). By contrast, research on crowdfunding intermediaries and the associated financial intermediation has been largely neglected. The proposed crowdfunding intermediation theory bridges previous research on crowdfunding and financial intermediation by conceptualizing intermediation mechanisms as central constructs of financial intermediation. Therefore, we are able to describe how crowdfunding intermediaries transform lot size, risk, and information based on the implementation and bundling of a specific set of crowdfunding mechanisms. Unravelling the functioning of crowdfunding intermediation by introducing a systemic perspective enables researchers to take a more fine-grained perspective on single mechanisms and their cause and effects (Mollick 2014; Mollick and Robb 2016; Younkin and Kuppuswamy 2017). Thus, the theory is generalizable to the field of crowdfunding and can be used to unravel the buildings blocks of crowdfunding intermediation, classification of crowdfunding intermediaries, and differentiating crowdfunding from traditional financial intermediation.

Second, the proposed crowdfunding intermediation theory does not only describe single components, but also unravels the relationships between these mechanisms and patterns within their configurations resulting in timely stable archetypal systems that effectively balance demand and supply for capital (Burton-Jones et al. 2015) within a specific funding context. Thus, our empirical analysis identifies dominant configurations based on the co-occurrence of the intermediation mechanisms' specific

instantiations. The three identified archetypes of profit-oriented, philanthropic, and hedonic crowdfunding intermediation describe the generic orientation and inner workings of how the crowdfunding intermediation between capital givers and capital seekers is performed and, thus, does account for the multifariousness and complexity of the crowdfunding phenomenon. Thus, the theory of crowdfunding intermediation represents an empirical taxonomy that classifies crowdfunding intermediaries based on how they perform financial intermediation. Thus, crowdfunding intermediation theory extends current classification approaches for crowdfunding (Bradford 2012; Belleflamme et al. 2014; Hemer 2011), because it is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon. Our classification approach abstracts from single instantiations of specific mechanisms. It enables generalizable and timely robust classification, which serve as a more solid base for the location of future research on crowdfunding.

Third, the crowdfunding intermediation theory and respectively the identified archetypes also provide formative insights. The archetypes derived from crowdfunding intermediation theory do represent context-specific configurations, which ensure the effectiveness of the intermediation process. Thus, the alignment of a crowdfunding intermediary with its context-specific archetype enhances the effectiveness and thus, sustainability of the platform. This paves the way for more design-oriented questions within the field of crowdfunding, which has been largely neglected in research so far (Tomczak and Brem 2013; Beaulieu et al. 2015). Thus, the theory of crowdfunding intermediation provides general guidance for researchers, investigating the systemic structure and the effective design of crowdfunding service systems and helps to inform future designs.

Fourth, we extend financial intermediation theory (Allen and Santomero 1998; Diamond 1984) by addressing its previous mentioned shortcomings in the context of crowdfunding – coping with a high degree of digitization by applying innovative information technology, joint co-creation of value in ecosystems, a changed role of the intermediary, and the focus on niche markets. By considering crowdfunding intermediation being performed within an IT-enabled system of interrelated mechanisms it can be shown how financial intermediation is affected by digitization and the Internet. Crowdfunding intermediation theory helps us better explain industry dynamics in a digitized financial service industry and how digitization provides alternative approaches to providing established and necessary services for modern societies. In a similar vein, crowdfunding intermediation theory captures how financial

intermediation is encapsulated in different IT-facilitated intermediation mechanisms within in a multi-sided platform business. Whereas existing financial intermediation theory is agnostic regarding the role of digital technologies for providing financial intermediation, crowdfunding intermediation theory exhibits precisely which constituent parts of financial intermediation are now facilitated by means of digital technologies and specifically how these changes look like. In greater detail, we demonstrate how different configurations of these IT-enabled mechanisms shape the dominating modes of financial intermediation and thus create highly specialized offerings, which enable the creation of a long-tail. Researching the fast developing crowdfunding industry may improve our understanding of how the Internet and the digitization affect and reconfigure existing industries. This is particularly important as more and more industries are affected by these phenomena.

***Table 15: Profile: Crowdfunding Intermediation Theory***

| **Theory Overview** | |
|---|---|
| The system theory of crowdfunding intermediation describes how crowdfunding intermediaries perform financial intermediation. | |
| **Theory Components** | **Instantiation** |
| Form of representation | The crowdfunding intermediation theory is presented by the description of crowdfunding intermediation, which comprises capital givers and seekers as well as the crowdfunding intermediary. The theory provides an explanatory description of how crowdfunding intermediation is performed. |
| Constructs | The core constructs of crowdfunding intermediation theory are six mechanisms that perform the three functions of transforming lot sizes, risk, and information. These mechanisms are implemented in the crowdfunding intermediation system by certain instantiations, depending on the specific purpose and context of the system. |
| Relationships | Although the implementation of certain intermediation mechanisms is independent, there are robust patterns of co-occurrence and dominant configurations of them that result in three archetypes of crowdfunding intermediation – hedonism, philanthropic and profit-orientation. The alignment with one of the archetypes enhances the effectiveness of the configuration. |

| | |
|---|---|
| Scope | The theory is generalizable to the field of crowdfunding and can be used to unravel the buildings blocks of crowdfunding intermediation, classification of crowdfunding intermediaries, and differentiating crowdfunding from traditional financial intermediation |

**Practical Implications**

Additionally, our study provides two valuable contributions for practice. First, traditional financial intermediaries get deeper insights into how the Internet affects their industry and how their core functionalities are performed by applying innovative information technology. Characterizing potential competitors based on the empirical taxonomy, derived from crowdfunding intermediation theory, helps incumbents to gain a better understanding of the disruptive potential of crowdfunding and the new competitive arena. Second, for established crowdfunding intermediaries and emerging new players in the crowdfunding domain, the identified mechanisms of crowdfunding intermediation and the respective archetypes basically represent design choices for implementing effective crowdfunding intermediation. This might encourage current crowdfunding intermediaries to expand their activities and new start-ups to enter the market in order to open up unexploited niche markets, help to establish the phenomenon and to develop it further. In this regard, it may help to identify white spots in the own financial intermediation model such that our results should help facilitate the process of designing and creating more sophistic models of financial intermediation.

**Limitations and Further Research**

There are certain limitations to our research. First, our sampling procedure was limited to English or German speaking crowdfunding intermediaries. A broader cultural scope might produce slightly different archetypes of crowdfunding intermediation. Following this argument, cultural comparison in the context of crowdfunding archetypes might be promising avenue for future research, as the relationship to money and financial products is highly culture-sensitive. However, our sample shows a broad geographic dispersion, also including a variety of non-English/German speaking countries and a second round of data collection indicates robustness of the results. Further, as the USA, UK, and Germany are among the biggest and most mature crowdfunding markets worldwide, we strongly believe in the generalizability of our results. A second limitation relates to our qualitative coding approach. While we put

high effort in ensuring reliability and validity of our data, using objective platform data might have produced an even more sophisticated assessment of crowdfunding intermediaries. However, many of the characteristics investigated in our study have a dichotomous nature such that it was a deliberate decision to collect all data as dummy variables in order to reduce the complexity of data collection. However, the exact implementation of an instantiation of a mechanism and their combination is highly divers with regard to their performance. Future research might elaborate on the identification of successful implementation and configuration patterns. Finally, the crowdfunding industry is highly dynamic with most crowdfunding intermediaries being start-ups. As a consequence, models of financial intermediation are constantly evolving in the crowdfunding industry potentially leading to novel types of crowdfunding intermediation. However, especially due to the two independent rounds of data collection, we strongly believe that our identified mechanisms, instantiations, and archetypes of crowdfunding intermediation can be seen as stable and timely robust. However, future research might investigate the temporal evolution of crowdfunding intermediation mechanisms, their instantiations, and combinations.

Beyond the already outlined research gaps, our research might encourage other researchers to further unravel the inner workings of crowdfunding intermediaries. Therefore, our system theoretical perspective can be expanded by taking variance or process theoretical perspectives (Burton-Jones et al. 2015). This might help to increase the understanding of causalities and dependencies among the constituting components of crowdfunding intermediation systems and paves the way for generic design theories for crowdfunding intermediation systems.

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# 7. PUB 3: BLUEPRINTING CROWDFUNDING - DESIGNING A CROWDFUNDING SERVICE CONFIGURATION FRAMEWORK

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**Abstract**

Crowdfunding gained momentum over the last few years. In contrast to traditional forms of funding, the service provision of crowdfunding platforms is performed within service systems. These comprise a complex combination of IT and non-IT services, different stakeholders, and diverging contexts and purposes. The design and operation of such service systems represents a tough challenge. Therefore, we developed a crowdfunding service configuration framework in the form of a morphological box and derived three dominant design patterns by following a design science approach. Therefore, we followed three iterations, which comprise in total twelve expert interviews, three case studies and the analysis of 161 crowdfunding platforms. The configuration framework extends re-search on crowdfunding and service science by providing insights in how to support the systematic design of crowdfunding service systems, reducing their complexity, and giving a comprehensive overview over their building blocks.

**Keywords:** Crowdfunding, Service Systems, Modularization, Design Science

## INTRODUCTION

Crowdfunding represents a new way of funding projects or companies, involving a diverse crowd of private capital givers over the Internet, and is frequently considered a more transparent, easy, entertaining, and democratic way of funding. Therefore, crowdfunding gained momentum during the last few years and began to establish as an alternative way of funding. As a consequence a variety of complementary crowdfunding platforms emerged, ranging from altruistic to profit oriented offerings. These mostly start-up driven crowdfunding platform providers build innovative offerings for both, the utilization of highly specialized niche markets as well as the mass market for financial products. Crowdfunding start-ups use their high degree of automation, the Internet, the web 2.0, and innovative opportunities such as data analytics. In order to grasp these opportunities, the service provision of crowdfunding platforms is performed within service systems. This allows operators of crowdfunding platforms to provide some services by themselves, whereas they may source others from specialized partners (e.g. payment, banking, dunning) within a service system (Welfens 2010).

Despite the huge growth of the crowdfunding market in terms of origination volume and platform numbers, this growth is not distributed equally among all types of crowdfunding. While the market for crowdlending is booming, the market for crowdinvesting is stagnating. Further, the market in general is characterized by a large fluctuation and shows the tendency of consolidation (Blohm et al. 2015; Michels and Hoffmann 2016). As crowdfunding comprises a complex combination of services and stakeholders, the design of such service systems represents a tough challenge. Thus, many attempts to design new crowdfunding service systems struggle, as the complexity of the crowdfunding service system can't be overseen and it lacks knowledge about how to systematically design crowdfunding service systems. In order to overcome this challenge the design has to allow the decomposition of the crowdfunding service system into single components. This approach is known from the concept of service modularization (Böhmann and Krcmar 2006; Böhmann et al. 2014). Especially, during early stages of the development of crowdfunding services and the assessment of design choices, guidance is needed. Despite its relevance, research on crowdfunding has largely neglected the topics of how to systematically design crowdfunding service systems (Haas et al. 2015). This hampers the development of new crowdfunding offerings, the exploitations of new market niches and the maturation of the crowdfunding industry. Therefore, this paper pursues the

research question of *how potential crowdfunding providers can design crowdfunding service systems systematically*.

In order to answer this research question, this paper follows the design science (DS) paradigm (Hevner 2007; Hevner et al. 2004) by designing a crowdfunding service configuration framework, which takes the form of a morphological box, by combining a component perspective and a functional perspective. The crowdfunding service configuration framework aims at a structured and comprehensive presentation of crowdfunding service systems by presenting ten constituting service modules with in total 24 differentiating parameters and three dominant design patterns – altruism, hedonism, and profit-orientation.

This paper provides especially two theoretical contributions. First, the paper expands crowdfunding research by proposing a crowdfunding service configuration framework, which describes the building modules of a crowdfunding service system. Thus, the configuration framework provides an overview over required service modules and respective parameters. Second, the paper bridges research on crowdfunding with the field of service science. Thus, we contribute to service science, by proposing a framework for the systematic design of modularized services systems. Therefore, we contribute to the call for the design of novel artefacts, facilitating the engineering and management of service systems (Böhmann et al. 2014). For practice, this paper provides guidance for the systematic design of crowdfunding service systems, the decision support for the assessment of required competences, the identification of white spots for business opportunities, and a better understanding of the disruptive potential of crowdfunding.

The paper proceeds as follows. First, we give an overview over the related work regarding complex service systems and crowdfunding service systems. Second, our DSR approach is presented. Third, the iterative design process of the crowdfunding service configuration framework is described. Fourth, we discuss our findings and present our theoretical and practical contributions.

## RELATED WORK

### Complex Service Systems

A service is a bundle of activities, which takes place between the user and provider of a service within a service system (Chesbrough and Spohrer 2006; Peters et al. 2015b). Service systems can be described as value-co-creation of stakeholders, technologies,

and shared information (e.g., language, laws, measures, and methods) (Maglio et al. 2006). One can speak of a complex service, if multiple stakeholders are integrated into the service system, various interactions between them are necessary, and IT and non-IT activities are combined in order to harness its value (Menschner et al. 2011). In order to leverage the value co-creation, service systems follow a modular design, which enables the systematic engineering of service systems (Böhmann et al. 2014; Edvardsson et al. 2012). Modularization can be described as decomposition of a single object into decoupled single components, which can be combined in various way to create new configurations (Böhmann and Krcmar 2006). Modularization rests upon the basic principles of cohesion and loose coupling (Balzert 1996; Peters and Leimeister 2013) and has been already established in the context of service science (Tuunanen and Cassab 2011; Voss and Hsuan 2009).

### Crowdfunding Service Systems

Analogous to crowdsourcing, crowdfunding can be defined as collective financing by an undefined crowd by means of an internet-based open call (Belleflamme et al. 2013; Blohm et al. 2013a). Despite the large attention the topic of crowdfunding has drawn among the financial service industry, research on crowdfunding has largely neglected the systematic design of crowdfunding service systems. Certain studies aimed at the systemization of crowdfunding services systems (Belleflamme et al. 2013; Bradford 2012; Haas et al. 2014; Massolution 2013). Tomczak and Brem (2013) aimed at conceptualizing an investment model by taking a process perspective on crowdfunding service systems by applying process modeling technique. Wieck et al. (2013) made an early attempt to investigate how to develop, pilot and evaluate an crowdfunding service system, in order to support university startups. Liebenau et al. (2014), Hemer (2011), and O`Sullivan et al. (2002) argue that the advantage of crowdfunding service systems lies in their modular ecosystem structure, which enables the bundling and aggregation of various competences within a complex service system. Recently, Haas et al. (2015) reported about the implementation of the modular design of a crowdfunding service system.

## RESEARCH APPROACH

In order to develop a configuration framework for the systematic design of crowdfunding service systems, a morphological box turned out to be a valid form. A morphological box combines a component perspective by listing the building modules and functional perspective by detailing these modules in single functional

characteristics. This makes a morphological box a heuristic method for capturing complex issues (Zwicky 1967; Zwicky and Wilson 2012) such as the design of crowdfunding service systems. Besides, morphological boxes have been successfully applied to the context of complex IT services before (Hartmann et al. 2014; Peters et al. 2015a).

In order to develop and evaluate the crowdfunding service configuration framework, which supports potential providers of crowdfunding service system, we followed a design science approach. Design science research is highly suitable in solving a real world problem such as the systematic design of crowdfunding service systems. Therefore, design science aims at the iterative development of an innovative IT artefact. The design science paradigm, as suggested by Hevner (2007; 2004), aims at rigor and relevance of the proposed design by following three integrated cycles: relevance cycle, design cycle, and rigor cycle. The relevance cycle aims at bridging the design activities with its practical environment. Thus, it helps specifying the real-world problem, eliciting the needs and requirements for solving it, and the recirculation of the designed artefact to the field of practice. The rigor cycle ensures the interconnection between the designing of the artefact with the existing knowledge base. Thus, the design of the artefact is informed by existing theories and knowledge, while new knowledge, resulting from the design, is recirculated to the knowledge base. Surrounded and influenced by the relevance cycle and the rigor cycle, the design circle is situated in the center. The design cycle represents the iterative design activities, which are necessary in order to construct and evaluate the artefact.

We performed three iterations in order to design and evaluate the crowdfunding service system configuration framework. Within the first design iteration, the problem has been specified and requirements have been elicited from the field. Therefore, we conducted a comprehensive study of related literature and performed three expert interviews. All three interviewed experts aimed at engaging in the crowdfunding market by designing an own crowdfunding service system, but struggled, as they were unable to oversee the complexity of the crowdfunding service systems. The interviews led to a first impression of the scope and form of the configuration framework. Within a second phase, three case studies, comprising one illustrative example for each crowdfunding service system archetype – altruistic, hedonistic, and profit-oriented (2014) – have been conducted in order to identify the building components and characteristics of crowdfunding service systems. Further, service modularization technique has been applied (Peters 2014; Peters and Leimeister 2013). Therefore, the

identified services within the crowdfunding service system have been described on a process level in order to derive modularization parameters. Afterwards, these parameters are applied in order to identify the actual service modules. Thereby, a first version of the configuration framework has been designed. In order to evaluate the module validity, the framework's comprehensiveness, its applicability, and usefulness, six interviews have been conducted with crowdfunding experts (bank representatives, platform providers, and researchers), which participated in the design of a crowdfunding service system. This led to further refinement of the artefact. Within a final phase, the configuration framework has been applied to code 161 crowdfunding service systems, in order to identify dominant design patterns, which could serve as starting point for the design of crowdfunding service systems. A final evaluation of the configuration framework and the patterns has been conducted by interviewing the three initial experts again. The experts have been questioned whether the configuration framework meets their mentioned requirements and, by looking back, whether the identified design patterns represent suitable starting points for the design of their crowdfunding service systems.

## THE CROWDFUNDING SERVICE CONFIGURATION FRAMEWORK

### Iteration 1: Problem Specification and Requirements

Within the first design iteration, including all three cycles, the aim was to specify the problem and to elicit requirements for the configuration framework. In order to specify the problem and elicit requirements from the field, three expert interviews and a comprehensive literature study have been conducted. First, we started performing a relevance cycle by conducting three expert interviews in order to get an impression of the problem of designing crowdfunding service systems and in order to elicit design requirements. The interviews were conducted via Skype during June 2016 and were 30 to 60 minutes long. The interviewees came from two different banks and a start-up incubator. All three experts were responsible for the design of crowdfunding service systems in distinguishing contexts. All three struggled with their attempts to engage in the crowdfunding market, as they overstrained with the complexity of the crowdfunding service systems. They annotated consistently that especially during the beginning of their attempts, they longed for support in overseeing alternative options and dependencies. They had to waste a lot of time and resources in order to figure out basic functionalities of value proposition, value creation, and value capturing and assessing the general fit of a crowdfunding type to their desired objectives. The input from the relevance cycle has been expanded by performing a rigor cycle. Therefore,

findings from a comprehensive literature study, regarding literature on crowdfunding and complex service systems has been used to inform the elicitation of the requirements and to bridge the different literature streams, in order to enhance the current body of knowledge. After finishing the rigor cycle, we evaluated and refined our recent design activities – the deducted requirements – by interviewing our experts again, in order to ensure comprehensibility, correctness and applicability. Iteration 1 identified three major requirements: 1) Early-stage applicability and reduction of complexity. 2) Structured and comprehensive presentation of crowdfunding service systems. 3) Dominant design patterns as template. Table 16 gives an overview over the identified and evaluated requirements.

***Table 16: Design Requirements***

| **Requirement** | **Description** |
|---|---|
| Early-stage applicability and reduction of complexity | Crowdfunding is based on components and competencies, which have not been considered relevant so far (Haas et al. 2015; Liebenau et al. 2014). Thus, many struggle at early design stages to oversee its complexity and disruptive potential and lack critical competencies. Many different stakeholders are necessary in order to bundle the required knowledge. Therefore, complexity has to be reduced in a heuristic manner, in order to light up the opportunities, objectives, functionalities, and consequences of crowdfunding for the involved stakeholders. |
| Structured and comprehensive presentation of crowdfunding service systems | Due to its high complexity, the various functionalities and dependencies within the service system are hard to oversee. Therefore, a functional perspective, as well as a component perspective, have to be combined in order to structure the constituting components of a crowdfunding service system. Besides the comprehensive overview over the single services, ensuring flexibility for several configurations is paramount. Therefore, a modular structure of the implicated crowdfunding services within the framework enables the |

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| | loose coupling and thereby, easy reconfiguration of the components. |
| Dominant design patterns as template | As crowdfunding service systems can be designed for various purposes, the definition of what to achieve with an own crowdfunding service system and which configuration supports these objectives is often blurry. Providing dominant design patterns have to be identified in order to serve as a starting point for the design activities. |

Besides the deducted requirements, Iteration 1 led to a first impression of the scope of the configuration framework and identified a morphological box as a valid and suitable form, due to its ability to capture complex issues, bridging a functional and a component perspective. Its heuristic character reduces complexity and enables early-stage application even for unexperienced co-workers.

**Iteration 2: Designing the Configuration Framework**

After specifying the problem and eliciting requirements from the field, we conducted three case studies of the three experts' initiatives for designing a crowdfunding service system, in order to identify the building modules of crowdfunding service systems. These cases represent illustrative examples for each archetype of crowdfunding service system - altruistic, hedonistic, and profit-oriented (Haas et al. 2014). In order to collect the data for the case studies and evaluate our findings, we conducted multiple iterative interviews and workshops with the experts and the respective members of the project teams. Further, we studied the business models of each case example by analyzing public information (e.g., website, terms & conditions) and private documents (e.g. business plans, process models). In order to perform a rigor cycle, we studied literature regarding process and ecosystem modelling and service modularization in order to find heuristic methods for their illustrations and analyzes. Thus, we identified three suitable methods - activity chain modelling for processes (Österle 2013), e3 value for the illustration of ecosystems (Gordijn 2002), and TM3 as method for service modularization (Peters and Leimeister 2013). We began the design cycle by modelling the customer journey and the ecosystems. We continued by modelling the single complementary activities of each stakeholder, which supports the customer journey or the crowdfunding process. Thereby, participating stakeholders, interfaces, information-, and money flows have been considered and evaluated. Afterwards, the

activities have been modularized according to defined modularizing parameters, which aim at ensuring internal cohesion and loose coupling (Peters and Leimeister 2013). These parameters have been defined as 1) representing a pivotal topic within the crowdfunding process; 2) represents a closed activity; 3) is performed and provided by one stakeholder. Each identified service module represents a bundle of activities regarding specific processes within the configuration framework. These activities have been grouped by analyzing the intra service module cohesion, in order to identify the major parameters of a service module. The three case studies indicated a robust set of the similar ten service modules with in total 24 differentiating parameters. As the characteristic of the modules differentiate between each of the analyzed service systems, variations of the parameters have been defined. Defining these characteristics as variations of the module, allows the parallel selection of different characteristics for each module, within the crowdfunding service system. In order to ensure completeness and generalizability of our findings we performed another relevance cycle. We extended the identification of further parameter variations to a dataset of 161 crowdfunding service systems, which have been identified by conducting an online search. Search criterions included that: 1) it is active; 2) it is in German or English language; 3) the necessary information are publicly available; 4) it refers to a crowdfunding mechanism (e.g. mentioning the term crowdfunding). We reviewed each module parameter on each of the 161 crowdfunding service systems, included new variations and aggregated similar ones. In total one to six parameter variations have been identified and finally included in the crowdfunding service configuration framework. Table 17 gives an overview over the identified service modules and the according characteristics.

*Table 17: Overview of Service Modules*

| Service Module | Description |
|---|---|
| **Matchmaking** | Matchmaking between capital givers and capital seekers represents a pivotal service within the service system. Therefore, an e-market place is operated in order to provide information, and to register funding decisions. As the matchmaking takes place in a two-sided market, we identified the two parameters capital seekers and capital givers, which showed two respectively three variations. Thus, we identified *individual* and *institutional capital givers* and *individuals, non-profit organizations, and for-profit organizations* as capital seekers. |
| **Crowd Activation** | Crowdfunding includes the attraction, activation, and balancing of the 'right' crowd of capital givers and seekers in order to ensure funding success, attractive returns, and to generate thick markets and network effects. Therefore, activating activities are performed online and offline. These two parameters showed three variations respectively – *none, mass advertising and personalized advertising*. |
| **Customer Support** | Crowdfunding aims at being more unbureaucratic and easier. Therefore, overcoming initial barriers and to clarify customer issues is addressed by providing comprehensive support for both capital givers and capital seekers. Both parameters showed the same five variations – *none, offline support, online support, personalized support, and automatized support.* |

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| **Market Differentiation** | Crowdfunding mainly focuses on niche markets and serves the long tail of the financial service industry. Thus, it provides funding for project which cannot be served profitably by the traditional financial service industry. As crowdfunding service systems serve highly heterogeneous needs, a precise market differentiation is undertaken. Thus, we identified three market differentiating parameters – the motivation of the crowd, the market specialization of the service system, and the type of compensation, which is provided by the capital seekers. The motivation of the crowd differentiates between *altruism*, which aims at doing good, *hedonism*, which aims at satisfying own curiosity, and *profit-orientation*, which aims at satisfying monetary expectations. The specialization of crowdfunding intermediaries varies between *sustainability & social action, startup & new business, private consumption*, and *creative projects & products*. The compensations range from a *greater good*, where no compensation is provided, non-monetary *rewards*, *interest*, to proportional *profit-shares* according the success of the supported project. |
| **Investor Relations** | Crowdfunding as a more transparent and democratic way of investing aims at fostering communication between capital givers and capital seekers and enables a performance monitoring of the projects. The communication channels between capital givers and capital seekers revealed three variations- *none, traditional communication channels* (such as e-mails, telephone, fax), and *web 2.0 communication channels* (such as social media, blogs, and chats). As a second parameter performance monitoring is implemented by three variations – *none, progress bar*, which shows the actual funding status, or a *portfolio management system*, which enables an aggregated overview over the invested capital or even an automatized (re-)investment process regarding to the portfolio specifications. |

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| **Contracting** | Contracting is essential for ensuring liability and compliance. Therefore, we identified two major parameters within this service module. First, terms and conditions mainly regulates the use of the crowdfunding service in general. We found four variations – *none, standardized terms of use, privacy policy regulations,* and *payment regulations*. Second, the legal relationship between capital seekers and capital givers after funding success represents a differentiating parameter. This parameter showed the two variations *direct legal relationship*, in the case of a direct peer-to-peer relationship, and *indirect relationship*, in the case of a legal intermediation (e.g., a bank). |
| **Risk Assessment** | Overcoming information asymmetries is essential in order to provide funding for capital seekers and reduce default risks for capital giver. Two parameters have been identified – due diligence and feasibility. The due diligence aims at assessing the credit-, and trustworthiness of a project and the capital seekers. The due diligence parameter shows three variations – *none, traditional forms,* by assessing personal data and documents, and *big data analyses*, which includes information based on data analytics (e.g., behavioral information). The second parameter aims at assessing the feasibility of a project, which can be performed by three variations – *none, business/project plan*, and *prototype.* |

| | |
|---|---|
| **IT Functionality & Operations** | A reliable platform with satisfying functionality is pivotal, as it represents the digital point of contact between capital seekers and givers. Overall, three parameters have been identified. First, the development and hosting of the platform, which shows the three variations *in-house, external service provision*, and *white-label solution.* Second, the registration process for capital givers and seekers, which is performed by the three variations *none, website login (via e-mail and password)*, or *social login* (Facebook or Google). Third, the form of the application can be differentiated into the two variations *web app*, or *mobile app*. |
| **Payment** | Payment represents a pivotal service as a fast, reliable, and efficient flow of money can be provided. Four parameters have been identified. First, the actual form of the payment system, which shows four variations – *offline payment* (e.g., cash in-payment), *traditional direct payment* (e.g., credit card), *online direct payment* (e.g., PayPal), and *direct debiting*. Second, the time of the payment, which can be *pre-paid, instant-paid*, and *post-paid*. Third, in case of debt default four variations can be differentiated – *none, notifications, dunning,* and *debt collection.* Fourth, the form of the payment processing – *directly* between the capital giver and seeker or *indirectly* via a financial intermediary (e.g., a bank). |
| **Authentication** | In order to meet certain legal regulations, prevent fraud, and reduce risks for capital seekers and givers, know your customer (KYC) services are applied regarding capital seekers and capital givers. Both parameters show four variations – *none, personal offline identification* (e.g., via a post office, notary)*, automated digital identification* (e.g., digital passport, CAPTCHA)*,* and personal online identification (e.g., via webcam) |

These modules have been summarized within a morphological box, which represents the crowdfunding service configuration framework. For evaluating the proposed design of the configuration framework, with regard to module validity, the framework's comprehensiveness, its applicability, and usefulness, we conducted six interviews in total. Therefore, we re-interviewed the three initial experts plus three additional crowdfunding experts, which participated in the design or operation of a crowdfunding service system as well. One of the new consulted experts came from a bank and two from academia. First, the experts were asked to apply the configuration framework to their crowdfunding service system. Second, we asked them to rate the configuration framework with regard to comprehensiveness, its applicability, usefulness, and whether it meets the design requirements. The evaluation indicated good fit to the design requirements and confirmed comprehensiveness of the stated parameters and characteristics, high applicability for early design phases, and usefulness as it reduces complexity in a heuristic manner. The experts' feedback was taken into account thoroughly and led to further refinement of the configuration framework. The evaluated and refined version is presented in Figure 15.

**Iteration 3: Dominant Design Patterns**

The three cases and our search for parameter variations revealed fundamental differences in the module characteristics and the module configurations. Nevertheless, we assumed the existence of dominant design patterns, as these differences are related to the basic orientation of the crowdfunding service system, which ranges from altruistic, hedonistic, to profit oriented purposes (Haas et al. 2014). A rigor cycle regarding literature on the systemization of crowdfunding service systems revealed that these respective archetypes require different configurations due to differentiating target markets, related risks, legal reasons, and the motivation of capital givers and seekers (Bradford 2012; Haas et al. 2015; Tomczak and Brem 2013). Thus, the identification of basic design patterns would serve as a useful starting point for the design of crowdfunding service systems. Therefore, a relevance cycle has been conducted by applying the configuration framework to the 161 crowdfunding service systems from our previous platform analysis, which have been grouped according to its respective crowdfunding archetype – altruism (N=53), hedonism (N=60), and profit-orientation (N=48). Thus, the three groups showed large internal proximity with regard to four service modules, which differentiates clearly against the other groups - market differentiation, risk assessment, payment, and authentication. Thus, performing a design cycle, we defined three design patterns for crowdfunding service systems,

which correspond to the three crowdfunding service system archetypes altruism, hedonism, and profit orientation. The predominant parameter variations of the three design patterns are indicated by color-coding in the configuration framework (see Figure 15) - altruism: bright grey; hedonism: dark grey; profit-orientation: black.

The altruism design pattern is characterized by altruistic motives of the capital seekers and givers. Therefore, it focuses on sustainable and social caring projects and provides no compensation besides a sense for supporting a greater good. In contrast to the other design patterns non-governmental organizations appear as capital seekers. Typical examples for the altruistic design pattern might be *Benevolent*, *100Days*, or *Kiva*.

The hedonistic design pattern satisfies hedonistic motives and therefore, offers reward-based compensations and focuses mostly on the funding of creative projects. In order to reduce investment risks and to ensure the feasibility of the proposed crowdfunding projects, a feasibility check based on business or project plans or even prototypes is applied. Further, a basic level of activity in the case of debt default is performed by actively notifying defaulting capital seekers or givers. Typical examples for the hedonistic design pattern might be *Kickstarter*, *Startnext*, or *WeMakeIt*.

The most rigid pattern is represented by profit-oriented crowdfunding service systems, due to higher default risks and stronger legal regulation. Capital givers are motivated by gaining profits. Therefore, this pattern focuses on the funding of either start-ups or new businesses, where profit shares a predominant as compensation, or funding private consumption by granting loans and providing interests as compensation. Providing a portfolio-management system for fostering investor relations enables both, risk diversification and maximizing profits. Effective risk assessment is crucial due to the higher risk. Therefore, comprehensive due diligences based on traditional documentary are necessary. In the case of private capital seekers, these due diligences are often extended by data analyses based on the online behavior of the capital seekers (such as online times, previous visited websites, etc.). In the case of debt default, activities regarding dunning or even debt collection are predominant. Due to anti money laundering legislation, KYC activities are necessary in the profit-oriented design pattern. Typical examples might be *Companisto*, *Lendico*, or *Investiere*.

## DISCUSSION & IMPLICATIONS

This study presents a rigor and relevant crowdfunding service configuration framework in the form of a morphological box, which supports potential providers to

systematically design crowdfunding service systems. By applying service modularization technique, we identified ten service modules, which represent required constituting blocks of a crowdfunding service system. This modules can be implemented via 24 module parameters with two to six parameter variations. Thus the parameter variations represent instantiations of a service module within a crowdfunding service system, which represents design choices for the early-stage blueprinting of crowdfunding service systems. Our evaluation showed that the configuration framework is comprehensive, useful, and applicable. Further, we derived three dominant design patterns – altruism, hedonism, and profit-orientation. Thus, this patterns support previous findings of crowdfunding research (Haas et al. 2014). We identified strong in-group homogeneity among the characterization of several modules, which differentiates clearly in contrast to the other patterns. These differences can be explained by the basic orientation of the crowdfunding service systems, the differentiating motivation, risk, and legal requirements.

The configuration framework can be applied for both, the design of new crowdfunding service systems and the analysis of existing ones. In order to apply the configuration framework, each module has been assessed according to the desired output of the service system. The dominant design patterns may serve as a starting point. The parameter characteristics are designed as variations. Therefore, one can chose multiple variations for each parameter.

This paper contributes to research on crowdfunding and service science and provides especially two theoretical contributions. First, the paper expands crowdfunding research by proposing a crowdfunding service configuration framework, which describes the building modules of a crowdfunding service system and three dominant design patterns. Thus, the configuration framework and the dominant design patterns provide an overview over required service modules and respective parameters. By empirically deriving the dominant design patterns, thus verifying the appearance of certain design modules in specific contexts, we provide insights in the differentiating designs of crowdfunding service systems. This indicates that specific contexts (altruistic, hedonistic, and profit-oriented) require different modules in order to perform the context-specific service provision. By providing empirical evidence this paper supports and extends previous purely conceptual research on the modular structure of crowdfunding (Haas et al. 2015; Hemer 2011; Liebenau et al. 2014).

Further, considering the variety of crowdfunding service systems, the configuration framework may allow for the comparison of crowdfunding service systems on both, a functional and a component perspective, which might provide interesting results for a better understanding of crowdfunding in general and the design of crowdfunding service systems. Besides, the crowdfunding configuration framework possess predictive quality as the dominant design patterns indicate both, intra-group homogeneity and inter-group heterogeneity. Thus, the design patterns can be applied in order to predict the classification of a crowdfunding service systems to a certain crowdfunding archetype.

Second, the paper bridges research on crowdfunding with the field of service science. Thus, we contribute to service science, by proposing a framework for the systematic design of modularized services systems, which has been instantiated on the example of crowdfunding. Therefore, we contribute to the call for the design of novel artefacts, facilitating the engineering and management of service systems (Böhmann et al. 2014).

For practice, this paper provides guidance for potential providers to systematically design crowdfunding service systems. Further, it enables the decision support for the assessment of required competences, the identification of white spots for business opportunities, and a better understanding of the disruptive potential of crowdfunding. The three dominant design patterns serves as an initial blueprint for the implementation of a crowdfunding service system. Besides encouraging new market entrants e.g., banks or start-ups to systematically exploit white spots of the crowdfunding market and to develop new crowdfunding offerings, our findings might support established providers of crowdfunding service systems to evaluate their current system configurations.

We hope our study will encourage future research to take up the idea of crowdfunding as modular service systems. This might facilitate future studies to analyze the building modules of these service systems and their interrelations in more detail.

## *Figure 15: Crowdfunding Service Configuration Framework*

| *Service Modules* | *Parameters* | *Variations* | | | |
|---|---|---|---|---|---|
| **Market Differentiation** | Crowd Motivation | Altruism | Hedonism | | Profit-Orientation |
| | Specialization | Sustainability & Social Action | Startup & New Business | Private Consumption | Creative Projects & Products |
| | Compensation | Greater Good | Reward | Interest | Profit Share |
| **Matchmaking** | Capital Giver | Individuals | | Institutional Investors | |
| | Capital Seeker | Individuals | Non-Profit Organizations | Non-Governmental Organizations | For Profit Organizations |
| **Crowd Activation** | Offline | None | Mass Advertising | | Personalized Advertising |
| | Online | None | Mass Advertising | | Personalized Advertising |
| **Customer Support** | Capital Giver Support | None | Offline Support | | Online Support |
| | | Personalized Support | Automatized Support | | Peer-to-Peer Support |
| | Capital Seeker Support | None | Offline Support | | Online Support |
| | | Personalized Support | Automatized Support | | Peer-to-Peer Support |
| **Investor Relations** | Communication Channels between capital givers/seekers | None | Traditional Communication Channel (E-Mail, Telephone, Fax etc.) | | Modern Communication Channels (Social Media, Blog) |
| | Performance Monitoring | None | Progress Bar | | Portfolio Management System |
| **Contracting** | Terms and Conditions | None | Standardized Terms of Use | Privacy Policy Regulations | Payment Regulations |
| | Legal Relationships after Funding Success | Directly between Capital Seekers and Givers | | Indirect (via financial intermediaries e.g., banks) | |
| **Risk Assessment** | Due Diligence | None | Traditional (personal data & documents) | | Data Analysis |
| | Feasibility | None | Business Plan / Project Plan | | Prototype |
| **IT Functionality & Operations** | Platform Development & Hosting | In-House | External Service Provider | | White-Label Solution |
| | Registration Process | None | Website Login (E-mail & Password) | | Social Login (Facebook/Google) |
| | Applications | Web Application | | Mobile Application | |
| **Payment** | Forms of Payment | Offline Payment | Traditional Direct Payment | Online Direct Payment | Direct Debiting |
| | Time of Payment | Pre-paid | Instant-paid | | Post-paid |
| | Debt Default Actions | None | Notifications | Dunning | Debt Collection |
| | Payment Processing | Directly between Peers (capital seeker and giver) | | Indirect via Financial Intermediaries | |
| **Authentication** | KYC Capital Giver | None | Personal Offline Identification | Automated Digital Identification | Personal Online Identification |
| | KYC Capital Seeker | None | Personal Offline Identification | Automated Digital Identification | Personal Online Identification |

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# 8. PUB 4: MODULARIZATION OF CROWDFUNDING SERVICES - DESIGNING DISRUPTIVE INNOVATIONS IN THE BANKING INDUSTRY

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**Abstract**

Crowdfunding represents a disruptive innovation in the banking industry by enabling the exploitation of market segments. Incumbents struggle to utilize this new phenomenon as crowdfunding is based on modules that have not been considered relevant for banking so far. Nevertheless, crowdfunding services are not entirely new compared to traditional banking. We argue that the modular design enables a bank to utilize crowdfunding. Thus, we started an action research project in order to investigate how modularization enables a bank to design crowdfunding services. Findings so far led to the identification of eleven preliminary crowdfunding services and their interconnection within an ecosystem. Our expected contribution will increase the understanding of crowdfunding services by bridging research on modularization, service ecosystems, and crowdfunding, and highlight the handling of disruptive innovations in an established industry. For practice, we provide a way of designing crowdfunding services in an efficient manner while building on already existing competencies.

**Keywords:** Crowdfunding, Crowdlending, Service Ecosystems, Service Science, Modularization, Action Research

## INTRODUCTION

In the last decade, the Internet has affected, threatened, and radically changed the existing business models of many traditional industries with start-ups introducing disruptive innovations. Such innovations not only have the potential to radically change traditional industries but also affect today's societies (Christensen 1997; Christensen and Overdorf 2000). Against this backdrop, incumbents in traditional industries often struggle to adapt to changing customer requirements. This is particularly the case in the financial service industry. While many banks lack a sense for innovation (Gartner 2010), a magnitude of fast growing fintech newcomers offer complementary and substitutional products for traditional banking services. Partially well-funded by millions of venture capital and equipped with a vision to change the world, this new class of competitors frequently moves faster and more flexible than banks in order to conquer existing and newly developing market segments. Impressive and well-known examples include novel online payment services (e.g., Paypal), innovative virtual currencies (e.g., Bitcoin), or crowdfunding as novel concept of lending and investing (e.g., Lending Club). Facilitated by the banking crisis, such fintech companies increasingly call traditional banks into question (Welfens 2010), pushing banks to develop innovative IT-driven business models and products (Beck 2010; Liebenau et al. 2014).

Given this novel competitive arena, banks become increasingly aware that particularly crowdfunding has an enormous disruptive potential. Crowdfunding represents a new way of financing projects or companies, involving a diverse crowd of private capital givers over the Internet (Belleflamme et al. 2013) and is frequently considered a more transparent, easy, and democratic way of funding in contrast to banks (Bretschneider et al. 2014; Schulz et al. 2015). Crowdfunding platforms that offer crowdfunding services operate as intermediaries between capital givers and capital seekers and can be classified according to their fundamental value proposition into three archetypes – hedonistic, altruistic and for profit (Haas et al. 2014). So far, in the domain of profit oriented crowdfunding, many crowdfunding platforms concentrate on market segments that banks could not serve efficiently, i.e., providing loans and equity to target groups with high economic risks such as self-employed, individuals with low income, or start-ups. For such market segments, established banking processes and structures are frequently inappropriate as they struggle to handle the magnitude of projects with comparably low funding volumes and/or scoring the risk of the projects accurately. IT enables crowdfunding platforms to serve such markets, trough 1)

developing novel approaches overcoming these shortcomings (e.g., risk scoring based on behavioral user data), 2) a high modularization and automation of the services provided, and 3) building service ecosystems in which each partner focuses on the single services that reflect their core competences while providing a joint and unified service bundle to capital givers and seekers (Liebenau et al. 2014; O'Reilly 2007). As a consequence, crowdfunding platforms are able to efficiently serve such market segments and build highly scalable business models. Thus, more and more banks are considering that especially profit oriented crowdfunding as disruptive innovation may threaten their business models in the mainstream market as the emerging concept gains maturity and may replace their own services (Liebenau et al. 2014).

Nevertheless, crowdfunding services are not entirely new compared to traditional banking services, as both aim at reducing transaction costs and information asymmetries (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). Thus, banks today already have competences which are necessary to offer crowdfunding service bundles, e.g., account management and payment. Further, banks have already established competences in meeting regulatory requirements with which also crowdfunding services bundles have to comply. This is particularly the case for profit oriented crowdfunding that has usually stronger regulatory requirements than the other types of crowdfunding (Bradford 2012). Other competences such as online matchmaking between capital givers and capital seekers and automatized data-based risk scoring are quite novel to them. However, the future competitive edge is based on services, which have not been considered relevant for banks so far (Liebenau et al. 2014). Considering crowdfunding as service bundle may allow for the identification, differentiation, and combination of services and constituting modules. In so doing, banks may provide some services by themselves whereas they may source other services which entail the actual disruptiveness of crowdfunding from partners in an evolving service ecosystem. Thus, modularization of innovative services and the integration of external partners in its service ecosystem would enable banks to keep up with the pace of the fintech industry in developing innovations and innovative business models while also leveraging their own strengths (Christensen and Raynor 2013). However, despite the determination of the relevance of modularity and partner integration in order to enable utilization of disruptive phenomenon like crowdfunding, current research has not described and conceptualized the modular structure of crowdfunding services in order to enable the systematic creation of innovative crowdfunding service bundles. In this paper, we report on an

ongoing action research project with a bank that closes this important gap in crowdfunding and modularization research by investigating how the application of a systematic service modularization method (Peters and Leimeister 2013) in the financial sector and the extension from a central banking provider to a crowdfunding ecosystem's perspective helps a bank to exploit disruptive innovations. Therefore, we follow three iterative research cycles, focusing on conceptualization, modularization, and implementation. Recently, we finished cycle 1 and have already started cycle 2, which led to the identification of eleven preliminary crowdfunding services, needed to perform a crowdfunding service bundle. Further, we develop a basic understanding of the crowdfunding service ecosystem. The paper is structured as follows. First, we develop a theoretical understanding of crowdfunding services by reviewing literature on modularization, service, and crowdfunding research. Second, we present the methodology and the project setting. Third, we discuss the five phases of the first research cycle. Fourth, we give an overview over the additional planned cycles 2 and 3. Last, we discuss our expected contribution as well as the implications for practitioners, e.g., banks.

## THEORETICAL FRAMEWORK

### Service Modularization and Service Ecosystems

Modularization is the decomposition of one object into decoupled single components with specified interfaces that can be combined to create new single object configurations (Böhmann and Krcmar 2006). In the context of services, the decomposition of an overall service creates modules which can be combined to create new service offerings. Modularization rests upon the basic principles of cohesion and loose coupling (Balzert 1996), with cohesion referring to the intra-module cohesion of the module elements and loose coupling to the inter-module dependency between the individual modules (Peters and Leimeister 2013). High cohesion is a requirement for well-specified modules that can be reused and combined with other service modules. Loose coupling means that there are only few inter-module dependencies between the elements of the different modules. Thus, loose coupling directs to the independence of the modules for easier reconfigurations. So far, modularization attempts have been conducted in a service context (Bask et al. 2010; de Blok et al. 2010; Tuunanen and Cassab 2011; Voss and Hsuan 2009). Also, the application of modularization in the context of innovation has been described by Teece (1986) and Langlois and Robertson (1992), who argue that the disintegration of modules to an outside network enables effective and valuable innovation by aggregating competences. Additionally, typical

modularization benefits such as reuse (of specific modules in different service offerings focusing on different target groups), module-wide innovation (with a clear concentration on the disruptive, value-creating parts), rapid re-configuration (of existing service offerings by enabling additional/disabling abundant modules), and faster development of new service offerings (by using existing modules) can be realized (Böhmann et al. 2008). A service itself is a set of activities being part of interactions between the components of service systems (Chesbrough and Spohrer 2006; Peters et al. 2015b). Service ecosystems are "value-co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information (e.g., language, laws, measures, and methods)" (Maglio et al. 2006) and represent the basic abstraction of service science (Spohrer et al. 2008). Among value-co-creation, these service systems inherit resource integration capabilities (Edvardsson et al. 2012) which are of particular interest in modular settings. In order to leverage efficient service development in such interconnected systems, the design of tools and methods for their systematic engineering is substantial (Böhmann et al. 2014).

**Crowdfunding Services**

Previous research on crowdfunding has focused on the investment decision of capital givers (Agrawal et al. 2010; Burtch 2011; Burtch et al. 2013c), their motivation (Bretschneider et al. 2014; Gerber et al. 2012) and success factors of crowdfunding projects (Mitra and Gilbert 2014a; Mollick 2014). Despite the popularity, the potential, and the rising range of crowdfunding services and applications, research on crowdfunding is still at the beginning. Especially research on the design of crowdfunding services has been very limited. Most notably, Wieck et al. (2013) investigate how information systems for crowdfunding services can be developed, piloted, and evaluated. Besides, some authors aimed at systematizing crowdfunding services (Belleflamme et al. 2013; Bradford 2012; Haas et al. 2014; Massolution 2013). Most recently, Haas et al. (2014) proposed three generic archetypes of crowdfunding services – hedonistic, altruistic and for profit. By taking a process perspective, Tomczak and Brem (2013) conceptualized an investment model of crowdfunding by using process modeling technique. Liebenau et al. (2014) considered crowdfunding services an emergent business model of banking for the utilization of market segments by building on its modular ecosystem structure. Within the ecosystem, banks as well as further service providers aggregate their competences to a service bundle (O'Sullivan et al. 2002). We define crowdfunding service bundle as the

overall service provision. These bundles consist of a combination of independent crowdfunding services, which are provided by different service providers (Baida et al. 2004; O'Sullivan et al. 2002). These can be defined as the actual service-performing elements (Chesbrough and Spohrer 2006). These crowdfunding services consist of several modules (Peters and Leimeister 2013). We define modules as the constituting components of crowdfunding services that enable the decentralized service provision by different partners within an ecosystem.

## METHOD

### Action Research

In order to study how to design crowdfunding service bundles, we applied action research. Action research is future-oriented and does not strive for distanced and generalizable explanations or the prediction of coherences but the joint understanding and learning by researchers and subjects as well as the changing of actual conditions based on a real problem within the ecosystem of the subject (Baskerville and Myers 2004; Susman and Evered 1978). Action research enables the aggregation of theoretical knowledge of the researchers with the subject's practical and situated insights and has established as viable method, especially in the research context of information systems, when researchers need to get deeply involved in the problem's ecosystem and when the change process itself is studied (Davison 2001; Kohler et al. 2011; Street and Meister 2004). To enable the deep involvement and the change, action research follows a cyclic and multiphase process, consisting of the five iterative phases Diagnosing, Action Planning, Action Taking, Evaluating, and Specifying Learning (Aguinis 1993; Baskerville and Wood-Harper 1996; Davison 2001). Action research has been described and applied as a viable method for the designing of service bundles in the field information systems.

### Project Setting

To shed light on the design of crowdfunding service bundles, we started a research project with a large Swiss bank in December 2013, which is still ongoing. The bank had scouted crowdfunding for some times, but struggled to find a profitable and valid way to systematically make this disruptive innovation accessible. Therefore, an interdisciplinary project team was set up consisting of researchers specialized in crowdfunding and innovation management, researchers specialized in service engineering, and bank executives specialized in innovation management and banking services. In order to assess the bank's opportunities of crowdfunding and designing a

crowdfunding service bundle, the research project was structured in three research cycles.

## CYCLES AND PHASES OF THE ACTION RESEARCH PROJECT

The first cycle focused on conceptualization in order to identify a proper market segment for the application of crowdfunding, to derive crowdfunding services, and to determine ecosystem partners. The second cycle aims at the decomposition of the identified crowdfunding services on a process level in order to develop modules as building blocks for the profitable utilization and implementation of the crowdfunding service bundle by enabling synergies and the management of the service ecosystem. Therefore, we follow Peters and Leimeister (2013) systematic modularization approach which - to the knowledge of the authors - is the only existing method for service modularization with clear descriptions of its according phases considering both, a service process perspective and the service provision within an ecosystem. After our search which was accompanied by some modularization experts' advice, we came to the conclusion that the specific modularization approach of Peters and Leimeister (2013) is capable of doing so. As it also includes clear descriptions of the to-be-performed phases within the method, we considered this approach adequate to assist in our modularization attempts in the crowdfunding domain. The third cycle focusses on the actual implementation of the modules and the crowdfunding service bundle. Currently, cycle 1 has been completed and we already started cycle 2.

### Cycle 1 - Conceptualization

#### *Phase 1: Diagnosing*

To get insights into the banks problem in utilizing crowdfunding, first interviews with senior managers and executives (N=3) were conducted in order to get an in-deep understanding of previous considerations and attempts. These interviews indicated that all previous attempts aimed at an internal realization and struggled to provide certain services and competences necessary to design a profitable crowdfunding service bundle (e.g., matchmaking, crowd activation, risk-scoring). Second, market and literature analyses were carried out to get an understanding of the basic functioning of crowdfunding and the Swiss crowdfunding market. Third, a workshop session with bank representatives from different departments was carried out in December 2013 (N=10), in order to identify market segments that could not be served with the bank's existing service offerings and which might be profitable addressable by means of a crowdfunding service bundle. Market and literature analyses, workshop results as well

as additional interviews and workshops with three senior executives with expert knowledge of banking products, a Swiss self-employment consultancy, as well as representatives of two crowdlending platforms, indicated the same potential market segment – small business loans for self-employed up to CHF 100'000. A huge body of research identified liquidity constraints and insufficient access to capital as the most prevailing threat for self-employed and small businesses (Evans and Jovanovic 1989; Holtz-Eakin et al. 1993; Johansson 2000). In other words, banks are not able to attend to their economic duty of providing capital for them. This is mainly caused by the bank's inability to profitably serve this market segment with their traditional business practices, as administration costs are too high. Due to its IT-enabled modular ecosystem crowdfunding is able to serve the long tail, like the market segment for self-employed. Thus, this market gap was considered an anchor for the development of an own crowdfunding service bundle. As traditional small business loans for self-employed are subject to Swiss regulation, the design had to be aligned with local legislation. Therefore, corporate legal experts, specialized consultants and the Swiss Financial Market Authority were closely integrated in the conceptualization. To ensure legal compliance of the designed service bundle, in deep analysis of all value and information flows have been modelled and presented to the Swiss Financial Market Authority for approval.

***Phase 2: Action Planning***

In order to design the crowdfunding service bundle providing small business loans for self-employed, a project team was commissioned. As crowdfunding service bundles are characterized by a modular structure within a complex service ecosystem, by combining traditional banking services (e.g., payment/banking services) with disruptive modules (e.g., crowd management, data analyses) (Liebenau et al. 2014) in a first step, existing crowdfunding service bundles were analyzed with regard to their services and ecosystems in order to develop a functional and institutional understanding. In a second step, this knowledge is used to identify existing competencies and requirements within the bank. And finally, a preliminary crowdfunding service bundle is conceptualized for the bank. Besides the discussed benefits and opportunities of a modular ecosystem structure - as reuse, module-wide innovation, rapid re-configuration, and faster development of new service offerings - the integration of external service providers, the management of the service ecosystem, the alignment of the network partner, and the aggregation of a service bundle might not be solely beneficial. Integration costs of external service providers or frictions

within the ecosystem might threaten not only the effective service provision but also the profitability of the business model. Thus, great caution needs to be exercised during designing, implementing and managing of the crowdfunding service.

***Phase 3: Action Taking***

In the action taking phase, a preliminary crowdfunding service bundle was designed. In order to identify requirements and existing know-how within the bank, several interviews (N=6) were conducted. The interview partners came from different departments, such as product management, legal service, compliance, new businesses, communications, and IT in order to receive comprehensive insights. The results of the interviews require the crowdfunding service bundle to be designed as a mostly stand-alone business, with the opportunity for the bank to up- and down-scale the bank's engagement. Besides the profitable exploitation of the market segment of self-employed, the crowdfunding service bundle should provide positive image effects for the bank regarding the bank's innovativeness and digital leadership. In order to enable the stand-alone design of the crowdfunding service bundle, which combines the bank's know-how with the additional crowdlending know-how, a partnership with an established crowdlending platform was entered for the realization. By that, a maximum of synergies was expected. Therefore, we first analyzed existing crowdfunding services (N=5) in detail in order to derive a preliminary understanding of the involved crowdfunding services and their service ecosystem. This analysis led to the identification of eleven preliminary IT-enabled crowdfunding services, which enable the overall crowdfunding service provision. Knowledge about these crowdfunding services is necessary in order to derive modules in the next action research cycle. Table 18 summarizes the preliminary IT-enabled services.

| **Services** | **Description** |
|---|---|
| Matchmaking | An e-market place is operated in order to interconnect capital seekers & givers, to provide information, and to register funding decisions. |
| Contracting & Compliance | After the funding goal is reached, automatized and standardized online contracting is provided in order to ensure legal liability and compliance. |
| Customer Support | Crowdfunding is a more unbureaucratic way of funding. Therefore, certain activities are performed to enhance the customer relationship in order to overcome initial barriers |

| | |
|---|---|
| | and to clarify customer issues. |
| Risk Scoring | Crowdfunding services rate risks related to the capital seeker by tracking credit-, trustworthiness, and project history. Traditional forms of risk scoring are extended by analyzing additional behavioral information (time tracking, project description). |
| Authentication | In order to meet legal regulations, prevent fraud, and reduce risks for capital seekers and givers, crowdfunding services apply comprehensive online identification and authentication processes. |
| Crowd Activation | Crowdfunding services perform the attraction, activation, and balancing of the 'right' crowd in order to ensure funding success, attractive returns and to generate network effects. Therefore, promotional activities (especially via social media) are performed. |
| Investor Relations | Crowdfunding is a more transparent and democratic way of investing. Therefore, certain activities and online tools enable instant and constant communication between the capital seekers and capital givers, e.g., performance and quality tracking of projects or investment portfolios. |
| IT Operations | The intermediary platform is the digital point of contact between capital seekers and givers. A reliable platform with satisfying functionality is pivotal for the success of the crowdfunding service bundle. |
| Payment | To enable a fast, reliable, and efficient flow of money between capital seekers and givers as well as the skimming of the platform fees, automatized (online) payment functionalities are provided. |
| Banking | Banking services for inter alia account management, providing ex ante-financing, and exclusive access to credit information are implemented. |
| Dunning & Debt Collection | In case of debt default effective dunning and debt collection services are needed in order to prevent or minimize the risk of investment losses. |

***Table 18: Overview over Services***

The eleven derived crowdfunding services are assessed concerning whether they represent traditional or disruptive services. Traditional services represent services, which have the potential to be performed by the bank itself as they have necessary skills, experiences, or power to act. Disruptive services represent services, which are new and beyond the experiences and competences of the bank and require an external service provider. The benefits of modularization can be realized best if its underlying principles – cohesion and loose coupling - can be integrated within the service provisioning. This is the case for the service modules presented in Table 18. Thus, they are distinctive and have clear functionalities and underlying service processes. Further, the interconnections between the partners are illustrated within the crowdfunding ecosystem (see Figure 16).

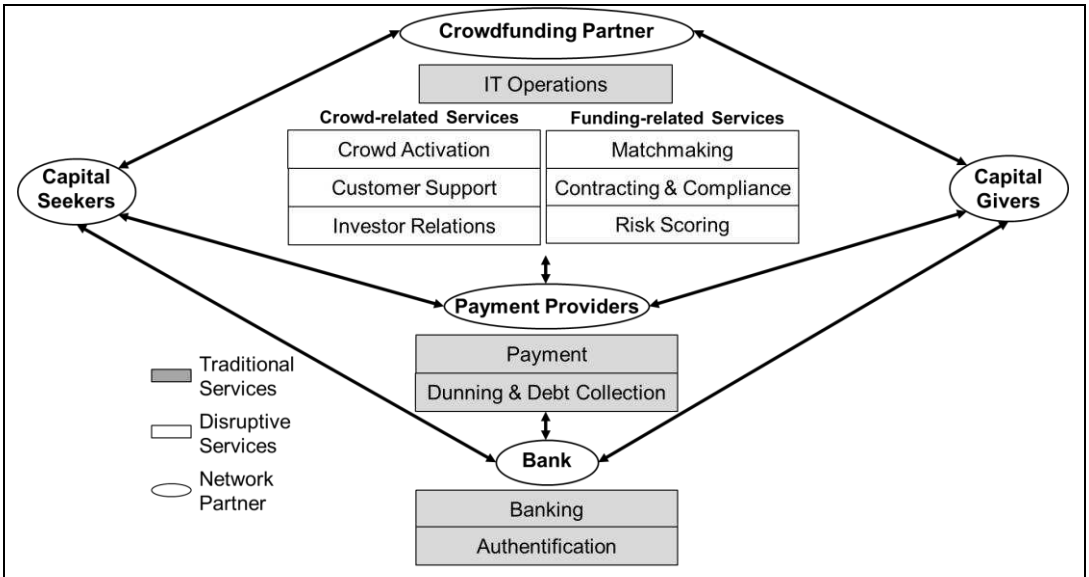


***Figure 16: Crowdfunding Service Ecosystem***

The conceptualized crowdfunding service ecosystem enables the bank to provide a profitable service offering. This can be achieved by charging both capital seekers and capital givers. Capital seekers are charged 3 percent of the desired loan sum, while the capital giver is charged 1% of the investment amount. Additionally, the capital seeker is charged a fixed fee per month for loan servicing. Further, kickbacks are generated within the dunning process or for the conclusion of external credit loss insurances.

***Phase 4: Evaluation***

The preliminary crowdfunding services and the service ecosystem were evaluated by two focus group workshops with senior and top-level executives. Both positively evaluated the fit of the service bundle to the bank's strategy and competences, its expected profitability and positive image effects, as well as its stand-alone capability. Thus the crowdfunding service bund meets the requirements. Further, Swiss Financial Market Authorities positively assessed the legal accordance of the proposed service bundle.

***Phase 5: Specifying Learning***

Findings so far revealed and validated an attractive market gap (small business loans for self-employed), the fit to the bank's strategy and competences as well as the concept's potential for positively affecting the bank's image with regard to innovativeness and digital leadership. Further, the first research cycle improved our understanding about crowdfunding as modular service bundle, which is performed within an ecosystem. The findings gave an in-depth understanding of the required banking competences and disruptive elements provided by the partner. The preliminary crowdfunding service bundle further revealed first insights in its modular structure and the interconnectivity within the crowdfunding service ecosystem.

**Cycle 2 & 3 – Modularization and Implementation**

Table 19 summarizes the two additional planned cycles. Cycle two focuses on decomposing the services into constituting modules, which will be used to implement the crowdfunding service bundle in cycle three.

| **Cycle 2 – Modularization** |
|---|
| *Phase 1 – Diagnosing:*<br><br>As the overall aim is to develop a crowdfunding service bundle, which enables the bank to integrate its competencies within the ecosystem. Thus, the derived crowdfunding services need to be further investigated as it is unclear how the services interact (Input/Output), and which interfaces are needed. Thus modularization will be applied.<br><br>*Phases 2 & 3 – Action Planning / Action Taking:*<br><br>Following the modularization method for services by Peters and Leimeister (2013) and Peters (2014), the derived services need to be analyzed on a process level in order to derive modularization parameters and by that identify modules which can be used for the |

designing of the crowdfunding service bundle, which enables the connection of the bank's and the partners' competencies in order to utilize the market segment. Thus, the preliminary crowdfunding services are decomposed in single process steps, modularization parameters are derived, and modules will be built.

*Phase 4 – Evaluation:*

In order to assess and evaluate these modules with regard to their ability to perform consistent crowdfunding services, closed card sorting experiments will be applied (Fincher and Tenenberg 2005). Card sorting originated in Personal Construct Theory (Kelly 1955), which is based on the belief that different people categorize the world differently (Upchurch et al. 2001). Therefore, experts will be asked to assign the derived modules to the theoretically derived services of cycle 1 and to illustrate interconnections between the modules. Thereby, in-deep understanding about crowdfunding service ecosystem on a process level and the interconnections between modules will be developed.

*Phase 5 – Specifying Learning:*

Cycle 2 aims at providing validated modules, which represent the constituting parts of the crowdfunding services and enable the overall crowdfunding service provision by enabling the interconnection of the single services and ecosystem partners. Thus, these modules can be used to design crowdfunding service bundles by effectively interconnecting traditional banking services and disruptive services within a service ecosystem in order to enable profitable service provision. The combination of module consistency and loose coupling of the modules enables typical modularization benefits such as reuse or module-wide innovation. Thus, modules can be reused within other services or replaced by new ones without affect the structure of the overall service.

**Cycle 3 – Implementation**

*Phase 1 – Diagnosing:*

The knowledge on the validated service modules extends the understanding of the components of the preliminary crowdfunding service bundle. Thus, the modules can be used in order to design the crowdfunding service bundle, which enables the profitable exploitation of the market segment of small business loans for self-employed by utilizing and interconnecting the bank's and the partners' competencies.

*Phases 2 & 3 – Action Planning / Action Taking:*

Building on the knowledge of the previous cycles, a crowdfunding service bundle will be realized, by implementing the derived modules of the bank or the partners within the service ecosystem in order to exploit the market segment of self-employed. The modularized design aims at enabling the combination of traditional banking services and disruptive components, realizing synergies, and meeting the requirements of the bank (up- and down-scalable engagement; impact on the perceived image).

*Phase 4 – Evaluation:*

Interviews with experts from different departments (e.g., risk management, compliance, business development, product management, and marketing) as well potential customers (capital givers and capital seekers) will be used to evaluate the quality of the modular services and their interconnection within the service ecosystem. Overall evaluation of whether the design is able to enable profitable exploitation of the market segment, whether it meets the requirements, whether the opportunities surpass the challenges of modularization, and whether it had positive impact for the brand will be assessed by taking a triangulated view on the outcomes. Therefore, interviews with the product manager, top management, and customers of the crowdfunding service bundle will be conducted. Further, platform data, survey and market analyses will be used to determine the impact on the brand and the design quality.

*Phase 5 – Specifying Learning:*

The modularized design of the crowdfunding service bundle aims at the profitable service provision by enabling synergies within an ecosystem. Further, the exploitation of a market segment, the utilization of a disruptive innovation as well as typical modularization benefits will be aspired.

***Table 19: Planned Phases of the 2nd and 3rd Action Research Cycle***

## EXPECTED CONTRIBUTION AND FUTURE WORK

To our knowledge, this study is the first to investigate crowdfunding from a modular service perspective. We expect our research project to provide three contributions.

First, our expected findings detail and extend the findings of existing research regarding crowdfunding such as Tomczak and Brem (2013) and Liebenau et al. (2014) by considering crowdfunding as modular, IT-enabled service bundle, which is

performed within an ecosystem. By decomposing these services into modules, crowdfunding service bundles can be designed, enabling the use and connection of traditional competencies of a bank and the disruptive competencies of external partners within a service ecosystem, as suggested by Christensen and Raynor (2013). Thus, our study increases the knowledge on the operation and structure of crowdfunding services. Further, our findings reveal that crowdfunding is not a completely new way of financial service provision but IT and especially the Internet enables combining traditional services of the financial intermediation (e.g., payment, banking) with disruptive services (e.g., matchmaking). This hopefully encourages researchers especially from the IS domain to focus on the actual disruptive about crowdfunding. Further, considering the variety of crowdfunding, ranging from altruistic, hedonic, to profit oriented services, the comparison of crowdfunding service bundles between these generic archetypes might provide interesting results for a better understanding of crowdfunding in general and the design of crowdfunding service bundles.

Second, our study illustrates how a dynamic Internet phenomenon like crowdfunding affects an established industry. By that, it serves as theoretical and practical example of how modularization might help incumbents keeping pace by enabling the collaboration with start-ups in order to utilize and exploit disruptive innovations. Therefore, incumbents' need to rethink their business models in a modular fashion. By that traditional modularization benefits such as flexibility, reuse, variability, and module-wide innovation can be realized. This might also have disruptive impact on traditional banking operations. Some of the identified crowdfunding services can be reused for other products of the bank, such as private loans or mortgages. Obvious examples might be the data-based risk scoring, automated contracting, or tools for enhancing investor relations.

Third, our expected findings contribute to modularization and service research. The modularization of services is applied to crowdfunding within the field of banking services. Thereby it can be used as a typical example of traditional domains which – by modularization of existing competencies – can be extended using innovative services as add-on. Thus, we show that service modularization is a key enabler for the providers to reach new markets. In terms of service research, we contribute to service systems engineering which calls "for research leading to actionable knowledge for systematically designing, developing and piloting service systems", for a multi-

stakeholder system perspective and for the provision of according tools and methods to manage them (Böhmann et al. 2014).

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# 9. PUB 5: MANAGING DISRUPTIVE INNOVATION THROUGH SERVICE SYSTEMS – THE CASE OF CROWDLENDING IN THE BANKING INDUSTRY

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**Abstract**

The Internet has affected and partially radically changed the business models of traditional industries. Crowdfunding as a new concept of funding over the Internet by a large crowd has especially gained maturity. Crowdfunding offerings range from funding charitable projects or innovative gadgets to a funding alternative for start-ups or small businesses. Therefore, crowdfunding represents an innovative way to provide liquidity for illiquid markets. With regard to the banking crisis and the growing skepticism toward banks, crowdfunding is seen as a more transparent, democratic, and entertaining way of funding, which makes it highly attractive for banks. A senior innovation manager of The Bank of Switzerland (TBOS), one of Switzerland's largest and most traditional banks, recognized the disruptive and beneficial potential of crowdlending. By facing strong resentments, he developed the idea of TBOS engaging in crowdlending by collaborating with a start-up by bundling competencies in a service system.

**Keywords:** Crowdfunding, Crowdlending, Disruptive Innovation, Service Systems, Teaching Case

## INTRODUCTION

When Nick[21] woke up on a Monday morning in summer 2015, he was excited. He had just started his new job as head of the Innovation Management team at one of the largest banks in Switzerland – *The Bank of Switzerland* (*TBOS*). Previous to this job, he worked as innovation scout in the Silicon Valley for one of the leading Swiss IT companies. In the Silicon Valley, he really loved the start-up spirit, the vibrant work attitude, and meeting fascinating entrepreneurs having nothing but a vision to make the world a better place day in and day out. Given this background, he seemed to be the ideal candidate for running the Innovation Management department at *TBOS*, where he was confronted with laborious and formal organizational processes, rigid structures, and the inertia of a traditional market incumbent. After three months of adjustment and ramp-up, he felt more and more empowered to care about his most prevalent duty – setting *TBOS* at the forefront of digital innovations in the Swiss financial service industry.

His excitement was raised by a newspaper article that he was reading while drinking his morning coffee before driving to work: *"Crowdfunding on the rise"*. His curiosity about this topic revived while reading the article. Nick remembered how he first heard about crowdfunding in 2012, when *Pebble*[22], one of the first manufacturers of smart watches, tried to raise 100,000 USD via *Kickstarter*. The project gained large publicity, and finally, over 70,000 Internet users supported the project with more than 10 million USD. At that time, Nick recognized how Silicon Valley soaked up this new way of funding creative projects and start-ups. The article stated that *c*rowdfunding started to provide funding for innovative and creative projects at their beginning while the capital givers were offered a reward for their investments. According to the article, the crowdfunding market had matured and more and more platforms offered serious alternatives to traditional bank credits. When he read that crowdfunding was also entering Europe and the British Business Bank[23] was investing 40 million British Pounds in a crowdfunding platform to issue credits to small and medium enterprises, Nick was wondering how crowdfunding might impact the Swiss financial service industry and he started to think about implications for *TBOS*. On his way to work, he

[21] This illustrative case elaborates on experiences during a research project together with a Swiss bank. In order not to publish any details on the organizations' inner processes, or to publish any confidential information, the names of the organizations and the characters are disguised.

[22] https://www.kickstarter.com/projects/597507018/pebble-e-paper-watch-for-iphone-and-android/description

[23] https://www.fundingcircle.com/blog/2014/02/british-business-bank-lends-40m-funding-circle/

decided to put crowdfunding on *TBOS*'s digital innovation agenda and to assess the opportunities of crowdfunding for *TBOS*.

During the innovation team's meeting on that day, Nick was excited to mention his discovery. He reported about the article, the great opportunities crowdfunding might offer, and the disruptive impact this phenomenon might have on the whole financial service industry. During his report, Nick recognized the rolling eyes of Steve, the representative of *TBOS*'s Compliance & New Business department. Unsettled, Nick addressed Steve whether he had any objections. Steve rose to speak and explained that *TBOS* had already evaluated this topic several times and they had been unable to design a profitable and viable business model within *TBOS* due to the high regulatory complexity *TBOS* was facing as a bank. Bringing an own crowdfunding platform into action that meets the high quality standards of *TBOS* would be way too expensive. Besides, *TBOS's* IT department would be working to capacity until 2018 due to other projects that were much more important. Steve concluded that TBOS should not waste its time with this topic again.

Nick was surprised about the strong rejection and resentment. He thanked Steve for the comment as he did not know that this topic had been examined before. Nevertheless, Nick decided he wanted to have a closer look at the previous initiative as he felt convinced that crowdfunding might bear some potential for *TBOS*.

## THE CROWDFUNDING MARKET

Crowdfunding has gained huge momentum during the last few years. In the beginning, the major aim of crowdfunding was to provide funding for creative projects or innovative gimmicks. Therefore, capital seekers could promote their ideas on intermediary crowdfunding platforms and attract potential capital givers by offering them attractive rewards according to their investment volume. Possible rewards range from handwritten thank-you cards to limited or early versions of the product. This crowdfunding type is mostly referred to as reward-based crowdfunding and can be characterized by a hedonistic orientation. Over the last decade, the idea of collective funding by a crowd of capital givers has matured and additional crowdfunding types emerged. These include donation-based crowdfunding, which has an altruistic orientation and aims at funding charitable projects or NGOs. Further profit-oriented crowdfunding types emerged, such as equity-based crowdfunding, where start-ups try to collect equities by offering shares or profit participation, or crowdlending (for an overview, see Exhibit 1). In terms of funding volume, crowdlending is the most

relevant crowdfunding type. In crowdlending, capital seekers make calls for the funding of loans. These loans are mostly for funding private consumption (e.g., travelling, cars, or furnishing), private purposes (education, tax payments, debt restructuring), or business purposes (current and fixed assets). Thus, the business model of crowdfunding in general allows the creation of highly specialized long-tail offerings. Therefore, a crowd of both private and institutional capital givers is addressed. For capital seekers, crowdfunding brings liquidity and funding to markets that could not be served so far, and for capital givers, it provides attractive investing alternatives. As a consequence, a broad magnitude of different crowdfunding offerings has emerged.

As Exhibit 3 shows, global crowdfunding is characterized by enormous growth and its figures multiplied each year. Crowdlending especially accelerated its growth each year and increased its importance. Compared to a more mature market such as Germany, Switzerland is still in its infancy, as shown in Exhibit 5. Up to now, the practice of crowdfunding in Switzerland has not yet picked up speed, which might indicate either unexploited market opportunities or the refusal of this new type of funding among peers. A few smaller platforms have been started aiming at collecting funding for social or creative projects at a very small scale. Recently, a local bank initiated a crowdfunding platform for supporting their regional donation activities. No major bank has engaged in crowdfunding so far. All existing platforms mostly have a strong regional focus. Further, single platforms aim at the crowdfunding of start-ups via profit shares. Due to the very low number of successfully funded start-ups and the low volume, this has not gained large attention up to now. In the crowdlending market, no platform exists so far.

## *TBOS* – AN INSTITUTION IN THE SWISS BANKING INDUSTRY

*TBOS* is one of the largest and most traditional retail banks in Switzerland. It has been in business for more than a century and, as of today, employs more than 4,000 people. Today, *TBOS* offers most of its services via their large branch network and its main competitors are regionally based banks that are in close contact with their customers through village-based outlets. *TBOS* is very well perceived within Switzerland, especially for its reputation as a stable, reliable, and yet forward-looking bank. Today, *TBOS*'s main business focuses lie in payment as well as private and retirement saving services where it acts as Swiss market leader. Half of the Swiss citizens and two thirds of the corporations in Switzerland are customers of *TBOS*. Even though these are great

numbers, *TBOS* was not able to establish a comparable market share in the markets for consumer and business credits, which do currently not belong to the core of its strategy. Also, *TBOS* was not able to set up a compelling online business. As a consequence, *TBOS* offers mortgage loans, credits, and also sells products through its public website, but only with limited success.

Although *TBOS* is charging its customers fees for transactions as well as for savings accounts, the majority of its income is generated through interest margins in the domain of saving services. This business model has been very successful for many years, but with the lack of good investment opportunities, times have become more difficult for *TBOS*. Additionally, as a consequence of the financial crisis in 2008, regulation guidelines are ever increasing, and being compliant with the new standards demands large investments on the side of *TBOS* in order to meet the new equity requirements. This puts pressure on margins, making the interest business less profitable. Therefore, *TBOS* is searching for opportunities to make itself more independent from what is called the core banking market. Two years ago, *TBOS* decided to sharpen its strategy and to embrace digitization in order to prepare itself for the future. This decision led to some heavy-duty investments within its core banking system, that is, the technical infrastructure processing all customer transactions and its surrounding applications. Over time, these projects started to consume large amounts of financial and human resources in order to handle their complexity. Unfortunately, due to internal competition for resources, important improvements in customer contact processes as well as many forward-oriented projects had to be delayed in order not to put the core projects at risk.

But even in times of focus, *TBOS's* management decided to keep an innovation process running as it understands the need for having a team that pursues opportunities outside of the standard business plan. The innovation team set up a process where new ideas can be developed and evaluated through several innovation gates. So far, most of the ideas have been brought up by *TBOS*'s employees and a good number of these ideas were quite interesting. However, the majority of the ideas were incremental suggestions for existing products. Further, *TBOS*'s innovation objectives suffer from the existing gap between *TBOS*'s innovation strategy and the actual willingness and capability of the different characters and departments toward engaging and supporting innovation projects. The different mindsets of the departments hamper the creation of an innovation-friendly environment and complicate Nick's work and the discovery and exploitation of disruptive innovations.

Nick leads the Innovation Management team with about 20 employees. The task of the Innovation Management team is to explore new trends, make them tangible, and to implement them within *TBOS's* organization. As shown in the organigram (see Exhibit 6), the Innovation Management team is organized as a staff group belonging to the corporate center. Nick reports directly to a member of the executive board, who is very open to new trends. Despite his high position, Nick himself has no decision-making power of which idea will be implemented and which resources are allocated to realize the idea. In order to implement ideas, the Innovation Management team relies on the development of internal networks and building alliances.

Maria is the leader of Product Management and has a very important and powerful position. Product Management manages *TBOS*'s core products and is highly profit oriented. Their power lies in the longstanding, carefully built customer relationships. Therefore, they prefer the status quo and are very critical of innovation as they are afraid of jeopardizing their power and unique customer access. They only support innovations that strengthen their position.

Steve works for the Compliance & New Business department, which is also organized as staff position in the corporate center, which employs primarily lawyers and legal advisors. As *TBOS* operates in a highly regulated market, their task is to evaluate and advise new business opportunities regarding their legal compliance in order to keep away any regulatory risks. In their eyes, innovations are rather risks than they represent opportunities. As they are very risk-averse they are very critical against any kind of innovation. They have regularly slowed and terminated initiatives coming from the innovation management team.

## UNRAVELING *TBOS*'S CROWDFUNDING HISTORY

After the innovation team's meeting, Nick asked Alex, one of the experienced innovation managers in his team, to support him in collecting and reviewing available information about the previous crowdfunding initiative. One week later, they met in order to discuss his findings. Alex presented that the Product Management department of *TBOS* had carried out a feasibility study one year ago. The study concluded that crowdlending might be the most promising type of crowdfunding for a sustainable and profitable business model, while donation- or reward-based crowdfunding might be suitable for improving the bank's image in terms of corporate social responsibility. Equity-based crowdfunding would not be feasible in the short term as *TBOS* had absolutely no experience and know-how in start-up financing, IPOs, and related legal

and regulatory issues. Further, the study concluded that crowdlending would sustainably become established in the Swiss market and provide great opportunities for *TBOS*, such as the exploitation of niche markets and providing innovative products for a new generation of customers. Nevertheless, they had solely considered an in-house development of the platform and missed to take the reuse of internal processes provided by the new core banking system into account. Thus, they had failed to create a profitable business case, and as a consequence, the executives of Product Management decided to turn down the initiative. Alex reported that the authors of the feasibility study showed no interest in re-examining the potential of a crowdlending platform for *TBOS*. Nick was wondering about this resentment and wanted to know who had been responsible for the study. It was Maria, head of Product Management. Nick concluded: "Oh dear, I'll schedule a meeting with her in order to find out what the problems are."

One week later, Nick sat in Maria's office. After some small talk, Nick could not wait to get to the point and asked her why she had decided not to start a crowdlending platform. Nick explained that he thought it was a very important trend that *TBOS* should try to utilize in order to exploit undeveloped niche markets and push the digitization strategy. Maria replied that she would agree that crowdlending was an interesting trend, but nevertheless, she did not believe it to be a cash cow. She pointed out how different crowdfunding was compared to *TBOS's* business. First, the platform itself, which would have to be integrated into *TBOS*'s banking system, would be needed. Second, the employees were experts for the traditional banking business and did not have any experience with crowdfunding or online crowds, *TBOS* would have to hire external experts. Third, she mentioned the unknown impact the new product might have on *TBOS's* brand. No one would know how the Swiss market and the customers would react when they would start such a new product. Fourth, *TBOS* would have to school all sales representatives, branch employees, and call center agents. Maria concluded that crowdfunding seemed to be fascinating but it would be an insignificant product that only aimed at certain niche markets that would not represent *TBOS's* core markets. Thus, it would not be possible to create a profitable business model. Further, Maria asked why *TBOS* should cannibalize its current products, which were quite successful. To her, the whole idea would just result in extensive effort, high costs, and unfulfilled expectations, for which someone would have to take responsibility. Maria closed: "Our evaluation showed clearly that the crowdfunding market is too small." Nick replied by asking whether she knew Bill Gates' quote, "Banking is necessary,

banks are not." Maria added mockingly: "Crowdlending won't threaten our business model, Nick!"

## REVAMPING CROWDLENDING AT *TBOS* – A PARTNERING APPROACH?

After the meeting with Maria, Nick was quite disenchanted. He thought about Maria's last sentence, which reminded him of the story of digital photography that he was taught during his studies. Starting with a poor resolution and low picture quality at the bottom of the market, incumbents laughed at this new trend while they continued to focus on their superior classic photography. Over time, digital photography improved and took over the market, while former market leaders, such as Kodak, were forced out of the market. Nick pondered that maybe it would just not be possible to see which impact crowdfunding might have on their life and business. He hurried to see Alex in order to tell him about the meeting. Nick remembered his Silicon Valley experiences. In Silicon Valley, the ultimate goal for all start-ups is growth. They want to capture a specific market niche and then try to outgrow all competitors so that they cannot be pushed out of the market anymore. He had seen many start-ups that teamed up with grown-up companies like *TBOS* in order to increase their business. It came to his mind that it might be worth exploring the option of collaborating with an already established crowdfunding platform. In so doing, *TBOS* could potentially overcome the burdens and the internal resentments while engaging in the market. "Nick, this is a very interesting idea! I will screen the crowdfunding scene and will try to schedule meetings with the most promising platforms. Being one of the biggest banks in Switzerland, there should be something that we could offer to them", Alex replied.

Alex immediately started his market research. Two days later, he presented his findings to Nick. He reported that so far, crowdfunding and especially crowdlending in Switzerland were still in their infancy. No platform was dominating the market in Switzerland so far. Therefore, he also screened the markets of neighboring foreign countries. In Germany, there were several platforms that had already established themselves in the market, achieving significant growth and starting to expand to foreign countries. In particular, the crowdlending platform *LendingHouse* seemed appropriate for a partnership as they had already expanded to five different countries in Europe by establishing partnerships with local partners. Nick was excited about the findings and proposed to get in touch with *LendingHouse* soon in order to find out whether they were interested in a partnership with *TBOS* and the Swiss market.

It did not take long for Nick to get in touch with Chris, the CEO of *LendingHouse* (see Exhibit 8). One day later, they arranged a conference call. Nick reported about his situation and that he was currently having a closer look on crowdlending. He explained that he thought it might have a huge impact on the financial service industry, but it would be hard to say whether it would rather be a substitute or complement. He struggled to assess how disruptive and sustainable this trend would actually be. Nick mentioned his assumption that *TBOS* was not the only bank that was investigating the topic and exploring possible opportunities at that time. Nick addressed Chris whether he, as CEO of the leading platform in the market, could share some of his experiences with him. Chris replied: "Well, first, thank you for contacting me. We are always interested in an exchange of experiences. That is what successful start-ups do, right?" Chris laughed and reported about the tremendous growth crowdlending had experienced over the last few years. Nevertheless, he was unable to say whether it would be a sustainable substitution for banking products, but he stated that he was sure that crowdlending would establish itself as a serious funding alternative. He proudly reported that *LendingHouse* was able to serve niche markets that could not be served by banks so far, due to risk, volume, and complexity, and they assumed this growth to continue or even accelerate. He continued that besides private capital givers, more and more institutional capital givers would discover the opportunities these markets provide and invest billions through crowdlending platforms.

Nick asked directly how *LendingHouse* could serve these markets, while banks seem to fail doing so. Chris explained that the Internet, and related phenomena such as big data, would enable them to profitably serve these niche markets. *LendingHouse* would exploit the increasing skepticism toward banks and provide a more transparent and democratic funding alternative. As opposed to banks, they would serve a different purpose within the financial intermediation process. Instead of striving for arbitrage revenues by pooling money from capital givers and lending it to capital seekers on their own account, *LendingHouse* would directly connect capital givers and capital seekers for a certain fee. Nick interrupted and asked how *LendingHouse* was able to handle this complex business model. Chris replied that *LendingHouse* would not provide the services all alone. Their platform would represent their face to their customers, but in the back office, they had several partners who were integrated into a service system in which also banks would represent crucial partners. *LendingHouse* would work with local banks in every country in which they had expanded so far, as it was important to have someone with local insights. Additionally, involving a bank

would be a trust-building element. Furthermore, in many countries, a bank would be needed for being able to perform financial intermediation due to regulatory reasons. Thus, banks already had competencies that were necessary in order to perform the crowdlending service provision and the banks could take different roles within the service system. Some of *LendingHouse*'s bank partners engaged as institutional capital givers, meaning that they would invest a great amount of money in their credit projects as they could offer very competitive interest rates. Other banks would take a more active role and provide some of the services in the service system, for example payment or sales support. The role would depend on the bank's intentions. "What do you think are the banks' intentions", Nick wanted to know. "Shouldn't you know this better than me, Nick", Chris joked and continued to explain that he thought banks would mostly hope for profits from a huge, unexploited market niche. Additionally, due to the extreme low-interest phase, they would try to become more independent from the interest business and boost their image in terms of digitization and innovativeness. Chris stated: "I think, I don't have to mention that most banks are not very innovative and have a very high backlog in handling the opportunities the Internet and digitization provides. They hope that engaging in an innovative business, such as crowdlending, will improve their image for customers and employees."

Nick recognized that he hardly knew anything about crowdlending, *LendingHouse*, and the opportunities for *TBOS*. He knew he had some homework to do. As his final question, Nick was curious to ask Chris whether *LendingHouse* was interested in entering the Swiss market and whether *TBOS* might be a suitable partner for them. Nick was delighted to hear that *LendingHouse* had recently had a closer look at the Swiss market and even considered *TBOS* as suitable partner. Chris stated they were very interested in deepening the exchange and he suggested Nick to evaluate what *TBOS*'s intentions and major goals might be and how *TBOS* imagined a possible partnership. After the call, Nick was both excited, as he might have identified a way to square the cycle – finding a way to profitably use crowdlending with minimal involvement of the bank – and exhausted when he thought about the mountain of work and the stressful and Sisyphus-like meetings he would have to make in order to convince his organization.

"How was the call with *LendingHouse*", Alex asked when he met Nick next day. Nick took a deep breath and reported that he had learned a lot and they definitely had some work to do before they could proceed with their idea. Crowdlending turned out to be way more complex as it seemed to appear on the surface. Nick explained that the key

to be successful in the crowdfunding business was to create competitive service systems in which each partner would bring in their specific competences. Banks might take different roles in such service systems and offer some services such as payment processing or sales support, or might just invest in the credit projects within their investment portfolios. “I think we could try another attempt for positioning crowdlending within *TBOS* if we are able to work out a compelling collaboration with *LendingHouse*. However, the feasibility study already presented very good reasons why *TBOS* should engage in crowdlending and was not further proceeded by our executives. The market clearly indicates that more and more customers become open to and fascinated by fintech innovations such as crowdfunding”, Nick concluded. Nick and Alex figured out they had to elaborate on two things: First, they needed to design a compelling service system with *LendingHouse* and a way to overcome the internal challenges with such a partnering approach. Second, they needed to elaborate on the innovative potential of crowdlending for *TBOS*, which seemed to be most critical. The new crowdfunding attempt would only be successful if the innovation team was able to show the advantages of engaging in the crowdfunding market more clearly to the management. “The problems we are facing here are not unique to crowdfunding but seem to be applicable to most digital innovations that are currently being developed at *TBOS*. If we are able to position our initiative as a means to overcome some of them, they might show more interest in the topic”, Nick closed.

## ASSESSING WHAT MAKES CROWDFUNDING DIFFERENT

During the next weeks, Nick and Alex got down to work, did much research regarding crowdfunding, and even held exhausting workshops within various departments, such as Product Management or Compliance & New Business, in order to assess *TBOS*’s position. After having signed a non-disclosure agreement, they constantly exchanged with *LendingHouse* in order to understand how crowdlending diverged from *TBOS’s* existing products and services and to unravel the fundamental mechanisms that make crowdfunding service systems successful and render crowdfunding an innovative alternative to traditional financial products. They elaborated these reasons in a memorandum, which was meant to serve as the basis for decision-making. In the following, an extract of this memorandum describes the most important findings:

1. **Digitization of business operations:** Being a pure online player, *LendingHouse*’s operations are mostly digitized. Besides few regulatory provisions, the whole credit processing at *LendingHouse* is performed online. They are constantly looking for

ways to digitize the rest in order to make the credit processing faster and more convenient for both capital seekers and capital givers. Therefore, they are proactively staying in exchange with financial market authorities in order to evaluate their new approaches. *LendingHouse* has improved the credit processing to such an extent that they are able to pay out the loan within 48 hours after the loan application has been submitted. At *TBOS,* this process needs at least two weeks. The vast digitization of business processes also gives raise to automation. For instance, credit scoring, that is, predicting credit default risk and determining associated credit interests for capital givers, is the most crucial competence for all kinds of financial intermediaries issuing credits. Applying an extensive big data approach by combining traditional credit scoring with behavioral user data, *LendingHouse* is able to predict credit default with higher accuracy than most traditional banks. Due to their offline distribution approach, banks lack access to these behavioral data, and thus, they do not have the opportunity of collecting and analyzing behavioral information. Thus, their risk assessment is heavily built on third-party services such as credit risk agencies and offline risk assessment. In contrast, *LendingHouse* includes a vast amount of behavioral user data that is generated by capital givers. In this vein, they include more than 500 data points in predicting credit default, for example the number of spelling errors within the credit application, previously visited websites, or the time of the application. This information is combined with traditional risk scorings by applying a complex and dynamic algorithm in order to improve the predictability of the capital seeker's default risk. The inclusion of new data points and the refinement of the risk scoring algorithm is a continuous challenge and the reason why *LendingHouse* hired leading risk experts and data analysis experts.

2. **Co-creation:** As the funding decision and the accompanying credit default risks are taken by the crowd, that is, a sufficient number of capital givers that fund a project, crowdfunding is considered to be more democratic and fair. Thus, *LendingHouse* supports the value co-creation between capital givers and capital seekers. Further, digitization enables *LendingHouse* to engage its crowd of capital givers and seekers in service provision. Applying Web 2.0 and co-creation mechanisms, for example commentaries, social media links, and video pitches, allows capital givers and seekers to directly interact while also making crowdfunding being perceived more contemporary, transparent, and entertaining, as it operates in the way the users are expecting it in the digital age. On the one hand, capital givers are mainly motivated

by attractive returns and the innovative platform concept. They appreciate the self-determination *LendingHouse* offers, as they can build their own portfolios that meet their individual requirements in terms of volume, duration, and risk affinity. In order to enable, foster, and secure the direct interaction and, for example, the portfolio building, *LendingHouse* is engaged in the value co-creation by acting as neutral, trustworthy, and objective partner that ensures integrity, veracity, and legal compliance in order to manage risks and uncertainties.

3. **Multi-sided platform business:** Matching supply and demand for capital is the major task of crowdfunding platforms. As Nick and Alex described it, it resembles a dating platform for capital givers and seekers. In this vein, crowdfunding can be considered as two-sided market where capital seekers and capital givers are interacting on a platform that acts as intermediary. In contrast to banks, they do not borrow, pool, and lend money on their own account, but enable the effective and efficient matchmaking of capital givers and capital seekers. As a consequence, *LendingHouse* does not carry any default risk as it is collectively carried by the crowd of capital givers. Thus, crowdfunding platforms do not make profits on the basis of an arbitrage interest business, but for successfully connecting capital givers and seekers. They take a matchmaking fee of 3 percent of the requested loan volume, which has to be paid when a project has been successfully funded by capital seekers, and 1 percent of each payback by the capital givers, respectively.

4. **The long tail of the financial service industry:** Digging deeper and deeper into the crowdfunding market, Nick and Alex figured out that most crowdfunding platforms seem to serve market niches that have not been served by banks or other traditional financial service intermediaries, for example credits for high-risk groups such as start-ups that have irregular earnings, high failure rates, and frequently lack a financial history. Other crowdfunding platforms frequently cover innovative niche products that are developed for specific interest groups instead of the mass market. *LendingHouse* mainly offers credits to capital seekers for private purposes, such as consumption, holidays, marriages, or rescheduling. The average credit volume is around 13,000 EUR. As credit volumes are low and default risks are high, these target groups have not been extensively served by banks and other traditional service providers. However, due to the digitization of business processes, the big data approach to risk scoring, as well as not taking any credit default risks, *LendingHouse* was able to cut the costs per loan significantly and is able to offer

these low-end loans in a profitable way. This has caused an enormous growth throughout the last years and enables the quick expansion to new market niches and foreign countries. Capital seekers pay interests ranging from 2.10 percent to 14.50 percent for private capital seekers depending on risk rating, payback duration, and credit volume. Besides, *LendingHouse* increased its offerings for self-employed and small businesses. Both markets are usually not served by major banks, as they are too risky or too small to be profitable. *LendingHouse* offers business loans starting from 10,000 to 250,000 EUR (100,000 EUR on average) with 4.0 percent to 16.00 percent of interests to be paid.

## CREATING CROWDFUNDING SERVICE SYSTEMS

After having worked out the mechanisms that render crowdlending an innovative service, Nick and Alex elaborated on the services crowdlending platforms usually offer and that serve as single building blocks in such service systems mentioned by Chris. It becomes clear that it is not only the service itself, but the overall service system that represents the disruptive innovation.

In such a service system, several – very often more than two – actors are involved in creating value propositions and offering services (Peters 2016; Peters et al. 2015a). Therefore, the stakeholders of the service system deliver own services that require resources and need to be integrated into the overall offerings. In this context, *LendingHouse* acts as the orchestrating and enabling entity of the crowdlending service system. Hereby, it bundles the competencies of several partners within the service system. *LendingHouse* represents the face to the user, while the back office processes are performed by partners of the service system. This enables the exploitation of typical network benefits, such as the expansion to new markets or market segments, the integration of up- or downstream value creation stages, establishing sustainable partnerships, and acquiring new competences. Additionally, it enables the creation of advantages in terms of efficiency and effectiveness, the focus on core competencies, the variabilization of fixed costs, and the reduction of complexity. The success of the crowdfunding service is determined by the interplay of its service system's stakeholders and the integration of resources. By design, the interplay focuses on the joint user-centric value co-creation of all service system stakeholders and the resource integration aims at realizing efficient processes (Peters et al. 2016).

The crowdfunding service system of *LendingHouse* consists of twelve services (see Table 20) that might be performed by different partners and are bundled to one crowdlending service bundle.

| **Matchmaking** |
| --- |
| Interconnection and intermediation of capital seekers & givers in order to ensure successful funding, provide information, and register funding decisions. Therefore, *LendingHouse* provides information about the capital seeker, such as use of funds, credit risk, and additional personal information. |
| **Contracting & compliance** |
| Automated and standardized online contracting and underwriting processes for the credit agreement between capital givers and seekers are provided in order to enable fast and efficient credit processing and to ensure the compliance of regulatory requirements. As *LendingHouse* does not have a branch network, they rely on digital solutions. |
| **Customer support** |
| Capital seekers & givers are served and assisted through various channels throughout the complete credit processing in order to emphasize the low level of bureaucracy, to enhance the customer relationship and the trust in the platform, to overcome initial barriers, and to clarify customer issues. For example, *LendingHouse* calls each new capital seeker or giver in order to clarify possible questions or uncertainties. Therefore, *LendingHouse* tries to overcome the anonymity of the Internet and the lack of a physical branch network where customers can come by in order to place inquiries. |
| **Risk scoring** |
| In order to keep default rates down, capital seekers are evaluated regarding their creditworthiness, credit history, and trustworthiness. Therefore, traditional forms of risk scoring (information provided by credit scoring agencies) are extended by the analyses of behavioral information coming from data analytics (online times, project description, cookies, etc.). The risk scoring procedure represents one of the most critical competitive edges, as high default rates would threaten *LendingHouse*'s reputation. |
| **Authentication** |
| In order to prevent fraud, money laundry, and to meet legal regulations, comprehensive online identification and authentication processes of both capital seekers and givers are applied. Due to the lack of a branch network, *LendingHouse* has to develop digital solutions. Therefore, innovative procedures are developed and |

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| presented to market authorities. |
| **Crowd activation** |
| Online and offline marketing is needed in order to attract, activate, and balance capital seekers and givers, and by that, to ensure funding success and attractive interest rates as well as to generate buzz. Therefore, *LendingHouse* has to evaluate the market situation in real time in order to immediately activate a certain customer group via various channels. |
| **Sales** |
| Besides promotional activities, leads, in terms of capital seekers, can be purchased from, for example, banks that cannot serve the clients themselves but want to provide alternative ways of funding or investing. Additionally, *LendingHouse* maintains a network to all kinds of institutional capital givers that invest larger sums. By that, *LendingHouse* can ensure a 100 percent funding rate that is independent of private capital givers. |
| **Investor relations** |
| As capital seekers and givers are interconnected directly, certain functionalities enable communication between them. Additionally, overviews of performance and quality of the investment portfolios are provided. |
| **IT operations** |
| The platform is the face to the users and the digital point of contact between capital seekers and givers. Further, complex back office processes are performed in order to orchestrate the service system and all integrated partners. |
| **Payment** |
| A fast, reliable, trustworthy, and efficient flow of money between capital seekers and givers as well as between the service system partners is crucial for a sustainable platform success. |
| **Banking** |
| For performing the credit processing, an account infrastructure is needed. Additionally, to ensure a fast credit processing, ex ante financing and exclusive access to credit information for the bank might be necessary. |
| **Dunning & debt collection** |
| In order to minimize the risk of investment losses, which affects the trustworthiness of the platform, effective dunning and debt collection are necessary in the case of debt default. |

***Table 20: Overview of Services provided at LendingHouse (Haas et al. 2015)***

## ENFORCING THE PARTNERING DECISION

After finishing the memorandum, Nick arranged a meeting with his and Maria's team in order to present his and Alex's findings and discuss the next steps. Nick shortly presented the outcomes of the memorandum and the re-examination of the potentials of crowdlending to *TBOS*. After this introduction, he proceeded: "I think that building a service system with *LendingHouse* would enable us to exploit this market profitably. Today, I would like to discuss with you what we should focus on and whether we should engage in crowdlending or not. *LendingHouse* expects our decision and time is running as I'm pretty sure that other banks have recognized the potentials of crowdlending as well. Time to market matters!"

During the meeting, they evaluated pros and cons and decided that, on the one hand, an own crowdlending engagement would help to revitalize *TBOS's* current credit products and provide opportunities for their digitization strategy. On the other hand, it would contain financial and reputational risks, which could not easily be overseen so far. Against this background, they particularly discussed that large new niche markets could be exploited by that, such as the market for small private or business loans. The business case was assessed to be profitable and possibly increasing fast. However, by taking a short-term perspective, figures were rather small such that an investment in a crowdlending business might resemble a bet on the future market development. Everybody agreed that partnering with *LendingHouse* represented a viable way to engage in the crowdlending business. Nevertheless, the costs for managing the partnership and the service system were hard to assess and would remain a black box that represented a risk for the business case, as *TBOS* lacked experience with this kind of partnership. Although *TBOS* was the larger partner in terms of financial resources, the know-how for operating the crowdlending offering was owned by *LendingHouse*, which would actually make *TBOS* the junior partner in this partnership, as *TBOS* would not be able to perform such a platform on its own. The meeting participants concluded that such an engagement might cause risks that could not be controlled completely. This included reputational risks as it could not be assessed how the market would react when *TBOS* would engage in crowdlending. Further, it implied regulatory risks as no specific regulation for crowdlending existed so far. In this context, the particularities of service systems played a significant role. It was not only the bank, its own resources, and the customers, as in a traditional setting of financial services, but also the new roles in the crowdlending service system, such as of the platforms and

intermediaries, which had to be considered. This might make substantial changes of the business model necessary, which might have negative effects on the business case.

At the end of the meeting, Maria rose to speak: “Nick, you know I have been very critical of this idea and I still am. I can’t believe that this phenomenon can sustainably affect the financial service industry. Of course, these start-ups did pick up some of our weaknesses and built successful business models around them. But don’t forget that the attributes we are arguing and criticizing are major reasons why we have been so successful in the past. Our clients appreciate that we are a reliable, constant, and stable partner, who takes care of their money, consults them with our expertise, and provides solutions for their financial needs. We protect our clients from over-indebtedness instead of funding loans for clients who can’t afford them. Last, due to our branch network and our personal financial consultants, we do have a personal relationship to our clients instead of just being an anonymous website. You should never forget that our clients entrust their money to us and this is a very sensible topic. A failure by engaging in a doubtful innovation, such as crowdlending, might cause severe damages to our brand."

Nick looked back at the past month, the tough job, and how this whole idea had taken shape. He was surprised about how the idea had become much more complex than he had ever expected. He summarized the results of the meeting: “Thank you all again for your constructive collaboration. I think we all learned a lot about crowdfunding and how start-ups invade and try to disrupt our business. Additionally, we experienced how *TBOS* is able to cope with these new competitors and how we are able to quickly use innovations and opportunities. Allow me the comment, this should make us think.” He proceeds: “I know there are some risks and issues. We should take them seriously as we will neither be able to eliminate them all, nor are we able to overview how crowdlending will develop in the future. We sufficiently discussed all these issues over and over. After all, we have to decide whether we are willing to take these risks and believe that the opportunities exceed the risks or not.”

Nick elaborated that the whole team now had to decide whether to pursue this idea any further or to terminate it. He expressed that if they decided to pursue this idea, the next steps would be to decide how the best service system for successful crowdlending looked like and how *TBOS* could contribute to and benefit from the service system.

After he finished, Nick took a look out of the window of the meeting room and looked at the snow-covered mountains. He recognized that it had been more than half a year

ago when he had read the newspaper article and took an interest in this idea. He felt tired when he thought about how slow things evolved at *TBOS* and how much work was still to do.

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Digital Frontiers for Service Innovation," Communications of the Association for Information Systems (39:1).

## APPENDIX

### Exhibit 1: Crowdfunding Types

***Figure 17: Exhibit 1 - Crowdfunding Types***

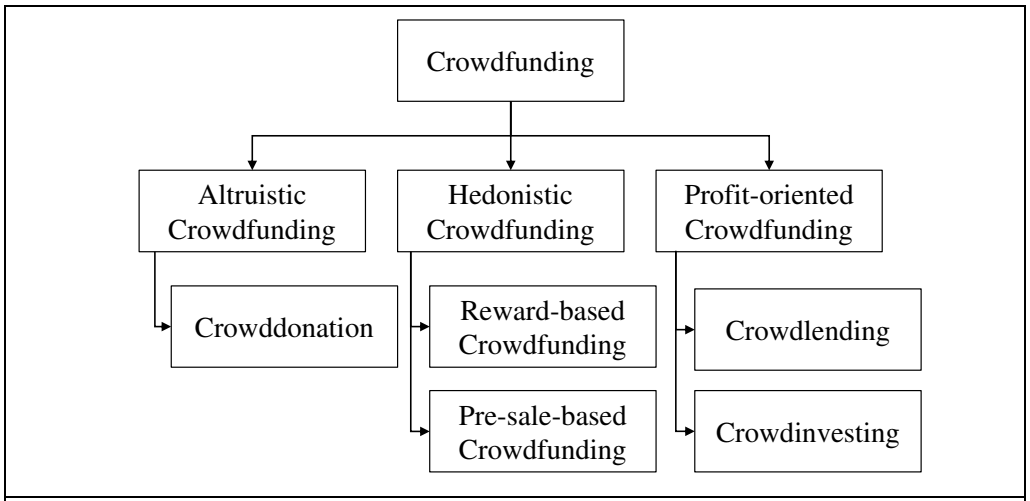
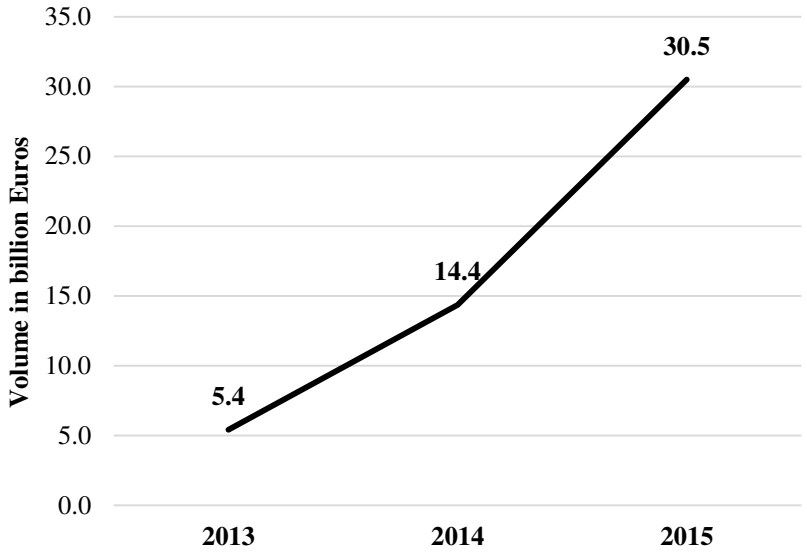



***Exhibit 1 Crowdfunding Types (Blohm et al. 2013b; Haas et al. 2014; Massolution 2013)***

**Exhibit 2: Development of the Global Crowdfunding Market**

***Figure 18: Exhibit 2 - Development of the Global Crowdfunding Market***

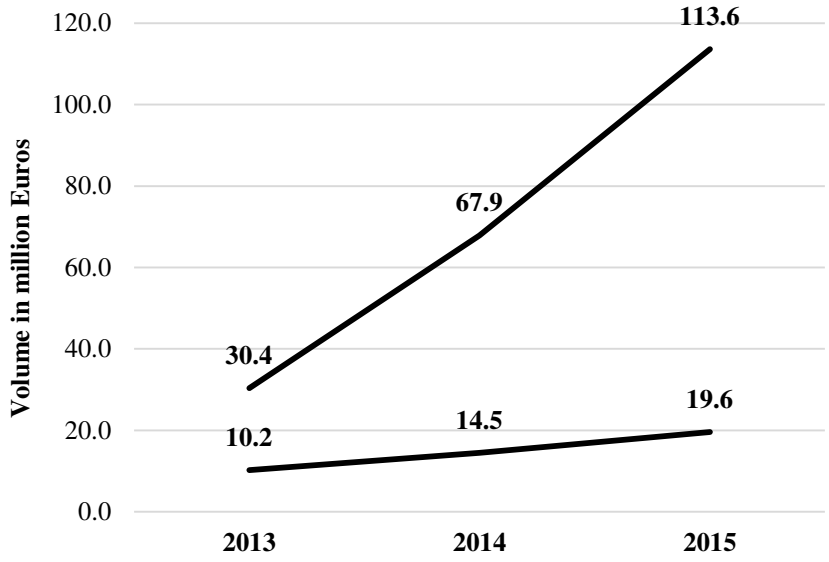



| Global | 2013 | 2014 | 2015 |
|---|---|---|---|
| Volume in bn EUR | 5.4 | 14.4 | 30.5 |
| Total growth in % | 166% | 112% | |
| Share of crowdlending | 57% | 68% | 70% |

***Exhibit 3 Development of the Global Crowdfunding Market (based on Dietrich & Amrein (2015), Blohm et al. (2015), Fuer-Guender.de (2016), Massolution.com (2015))***

**Exhibit 3: Development of the Crowdfunding Markets in Switzerland and Germany**

***Figure 19: Exhibit 4 - Development of the Crowdfunding Markets in Switzerland and Germany***




| Germany | 2013 | 2014 | 2015 |
|---|---|---|---|
| Volume in mil. EUR | 30.4 | 67.9 | 113.6 |
| Total growth in % | 123% | 67% | |
| Share of crowdlending | 33% | 52% | 59% |

| Switzerland | 2013 | 2014 | 2015 |
|---|---|---|---|
| Volume in mil. EUR | 10.2 | 14.5 | 19.6 |
| Total growth in % | 42% | 35% | |
| Share of crowdlending | 16% | 22% | 40% |

***Exhibit 5 Development of the Crowdfunding Markets in Switzerland and Germany (based on Dietrich & Amrein (2015), Blohm et al. (2015), Fuer-Guender.de (2016), Massolution.com (2015))***

## Exhibit 4: Organigram of TBOS

***Figure 20: Exhibit 4 - Organigram of TBOS***

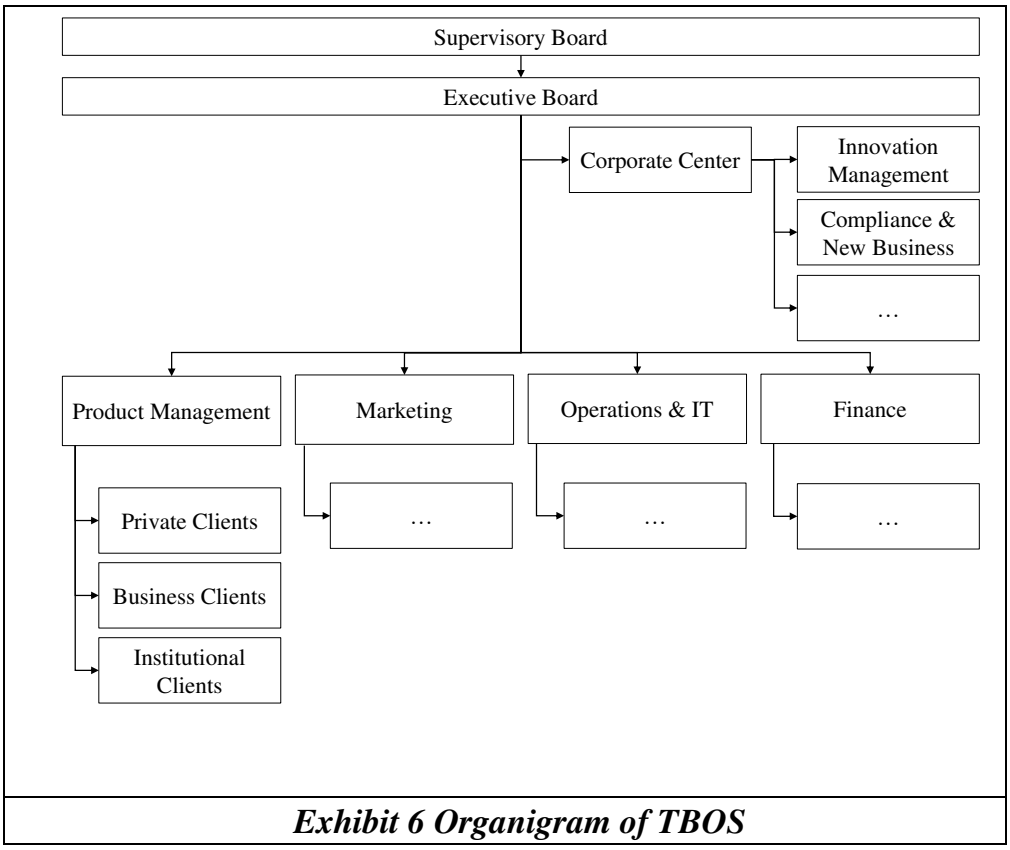



***Exhibit 6 Organigram of TBOS***

## Exhibit 5: Organigram of LendingHouse

***Figure 21: Exhibit 7 - Organigram LendingHouse***

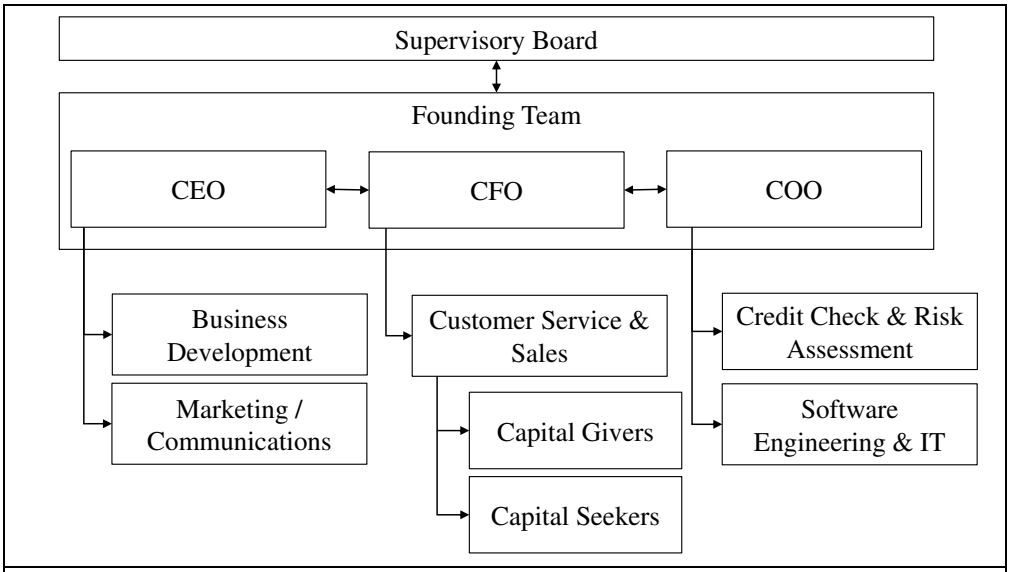



***Exhibit 8 Organigram LendingHouse***

# 10. PUB 6: DESIGNING CROWDFUNDING SERVICE SYSTEMS – TOWARDS A NASCENT DESIGN THEORY

*Philipp Haas*

Reference:
*Haas, P. (2019): Designing Crowdfunding Service Systems – Towards a Nascent Design Theory. IWI Working Paper, available at: https://www.alexandria.unisg.ch/257437/, St. Gallen, Switzerland.*

**Abstract**

This paper investigates, how incumbents of traditional industries can mutually design service systems with a partner from the digital world, in order to explore and exploit new business opportunities. As the competitive edge of these digital businesses is based on new competences, considering a decomposition and modularization approach allows the bundling of competences of multiple partners. This is particularly relevant in the financial service industry, where crowdlending as a startup-driven innovation gained large attention over the last few years. Despite the high proximity to traditional banking products, banks are struggling to keep pace and failed to leverage on the mutual strengths, so far. Thus, bundling competences with startups in modular service systems represents a straightforward solution for overcoming these short-comings. By conducting an Action Design Research project together with a large Swiss bank from 2014 to 2016, we systematically conceptualize the constituting components, exchange relationships, and the design of a crowdlending service system and thereby, contribute to crowdlending research. By formularizing the learnings from the project, we describe actionable design knowledge as a first step for the development of a nascent design theory, which supports incumbents throughout the design of service systems together with a partner from the digital world. Therefore, we provide a valuable contribution to service science.

**Keywords:** Crowdlending, Crowdfunding, Service Systems, Service Design, Service Engineering, Action Design Research

## INTRODUCTION

Digital technologies and new business approaches have affected, threatened, and radically changed traditional industries with start-ups introducing innovative solutions, which deeply impacted today's societies and individuals. Incumbents in traditional service industries struggle to keep up with the pace of these start-ups and to adapt to changing customer requirements (Christensen 1997; Christensen and Overdorf 2000). Frequently well-funded by millions of venture capital and equipped with a sense for exploring and exploiting opportunities, this new class of competitors frequently moves faster and more flexible than incumbents. Therefore, they rapidly and inexorable conquer existing and newly developing market segments and offer complementary and substitutional services by relying on their speed, flexibility, and customer centricity.

This is particularly the case in the financial service industry, where a plethora of start-ups sustainably disrupted and reshaped its landscape by building on service systems (e.g., digital online payment or virtual currencies) (Beck 2010; Liebenau et al. 2014). In particular crowdlending as novel concept of lending and investing (e.g., *Lending Club*[24]) gained large attention and momentum over the last few years and is an impressive example for this change. Crowdlending can be described as collective funding of loans by an undefined group of capital givers, where capital seekers and the crowd of capital givers are directly interlinked via an crowdlending intermediary by means of an Internet-based open call (Belleflamme et al. 2014). Crowdlending is characterized by a modular structure, comprising several activities and stakeholders within a service system (Haas et al. 2015; Liebenau et al. 2014). Despite the proximity to the traditional financial service industry, the competitive edge of crowdlending is based on components, which have not been considered relevant for the banking industry so far, such as crowd management (Liebenau et al. 2014). Besides, these new competitors are digital and *"analytical […] from birth"* (Davenport 2014), as their business models and core competencies include advanced data analytics such as analytics-driven risk scoring. By building on grown legacy systems, incumbents such as banks are almost unable to copy these approaches due to issues of speed and flexibility. Nevertheless, banks today already have competences which are necessary to offer crowdlending systems, e.g., account management, payment, and ensuring legal requirements. Besides, the banks most pivotal assets and competitive advantage over the crowdlending newcomers are the huge customer bases, which are based on long-standing relationships, trust and reliability. Therefore, bundling competences with

[24] www.lendingclub.com

startups and other service providers in service systems represents a straightforward solution for overcoming the organizational and operative shortcomings and leverage on mutual strengths.

Service systems can be defined as *"configurations of people, information, organizations, and technologies that operate together for mutual benefit"* (Maglio et al. 2015). This allows the provision of certain services by the incumbents themselves, whereas they may source others from specialized partners within the service system. This enables incumbents to keep up with the pace of start-ups while leveraging their own strengths and enables the startup to benefit from the incumbent's grown customer base, financial resources and reputation (Christensen and Raynor 2013). However, as service systems comprise complex combinations of multiple services and stakeholders, the design of such service systems represents a tough challenge. Despite the relevance of the service system perspective for the development of crowdlending service systems (CSS), current research has not described and conceptualized the modular structure of crowdlending services and the question of how to systematically design CSSs. Attempts to answer this question on a more holistic level reveals that research has largely neglected the topic of how to systematically design service systems. In order to leverage efficient service development in such interconnected systems, the design of tools and methods for their systematic engineering is substantial (Böhmann et al. 2014). Although the modular structure in service has been studied for many years and a system's and platform's perspective has been considered relevant (Tuunanen and Cassab 2011), the design of modular service systems can be considered highly relevant, but understudied (Yoo et al. 2012). First attempts for the systematic design of service systems exist (Teixeira et al. 2016), and even impacts on such design for the financial sector, have been examined (Ding et al. 2010), but neither does a theory for the design of service systems exist nor does current literature focus on the design of modular service systems as needed for crowdlending and all settings where the experience of incumbents and the innovative and agile character of startups are key to success and need to be combined. That is why our research question is *"how should the systematic design of service systems look like that enables an incumbent to partner up with digital-savvy partners to provide great value-propositions and user-centered services for their customers*".

Therefore, this paper follows an action design research approach (ADR), introduced by Sein et al. (2011), within a project with a large Swiss bank in order to systematically develop a CSS and formalize our lessons learned in order to provide

insights in the systematic design of service systems. The bank had scouted crowdlending for some times, but struggled to find a profitable and valid way to systematically make this disruptive trend accessible and to design an own crowdlending service offering. By considering a partnering approach together with a start-up, the bank was able to successfully enter the crowdlending market. Our research approach follows the four steps of ADR– 1) Problem Formulation; 2) Building, Intervention, and Evaluation; 3) Reflection and Learning; and 4) Formalizing of Learning.

Within the first step of ADR, we formulize the bank's problem, identify and analyze the related literature, and represent the real world problem as an instance of a class of problems. Within the second step of ADR, we conduct three design iterations – Initiation, Conceptualization, and Realization – in order to design the banks CSS and shed light on the components and inner workings of the system. Parallel to these steps, we conduct a reflection and learning step, which moves conceptually from building a solution for a particular instance to applying that learning to a broader class of problems. In the fourth step, we formalize these respective learnings. By doing so, we are able to derive an initial draft for an nascent theory of design and action in form of a five step design framework, which supports incumbents in the systematic design of service systems between together with partner from the digital world.

This paper has two major theoretical contributions. First, we extend current research on the functional conceptualization of crowdfunding (Beaulieu et al. 2015; Belleflamme et al. 2014; Tomczak and Brem 2013) by considering crowdlending as a decomposable modular service system. Thus, we describe the crowdlending service system by twelve constituting service modules and its inner workings on a process level. This enables the exploitation of traditional modularization benefits such as flexibility, reuse, variability, and module-wide innovation (Böhmann et al. 2008) and by that allows the bundling of capabilities of a bank and external partners, as suggested by Christensen and Raynor (2013).

Second, reflecting and formalizing the learnings of the ADR approach enables us, to contribute to service science, which calls for *"research, leading to actionable knowledge for systematically designing, developing, and piloting service systems"*, for a multi-stakeholder system perspective and for the provision of according tools and methods to manage them (Böhmann et al. 2014). Therefore, we are providing an initial draft for a nascent theory of design and action (Gregor 2006) in form of a multi-step

design framework comprising respective design guidelines and a course of action for the systematic design of service systems along the four categories of service systems - people, processes, IT, and organization (Maglio and Spohrer 2008b). This theory empowers incumbents in the systematic design of service systems with partners from the digital world.

For practice, this paper provides guidance for incumbents and digital companies for the systematic design of new service systems and engaging the mutual bundling of competences. This might encourage incumbents and new market entrants to engage new partnerships, develop innovative service systems, and exploit white spots more successfully.

## THEORETICAL BACKGROUND

### Designing Service Systems

Maglio and Spohrer (2008a) define service systems as *"value-co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information (e.g., language, laws, measures, and methods)."* Referring to them as ecosystems, Vargo and Lusch (2011) and Alter (2013) define service systems *as "work systems producing a service"*. Given these various definitions, one can agree on the many-to-many service experiences (Chandler and Lusch 2015) service systems are based on. Given this definition, the current literature can be well-presented in the following four categories: people, processes, technology and the organization.

Capabilities, interaction, change, and value are fundamental to those service systems and most of current literature on people within service systems concentrate on these topics (Maglio et al. 2015), especially considering service experience between the human entities of service systems. These service experiences are made during the co-creation of services (Vargo and Lusch 2004; Vargo and Lusch 2016; Vargo et al. 2008). The path of co-creation is not simple or uni-faceted, but rather involves a "*complex combination of activities and interactions between lead firms and network actors, characterized by both lead firm and network-based innovation*" (Perks et al. 2012) in which the service provider not only makes value propositions, but "*can engage itself in customers' value fulfillment as well*" (Grönroos 2008). The traditional role of the service provider transforms to a role of a service aggregator and orchestrator of the service systems, which is "*different than the dyadic buyer and seller standard equilibrium neoclassical economic model*" and needs according value

propositions which "*invite, shape, and potentially transform engagement in service*" (Chandler and Lusch 2015).

When considering the magnitude of service system resources, their integration in the value co-creation process is critical. Here, the actors' resource integration should *be "informed by both the value proposition and the service and social structures (with the dimensions of legitimation, domination, and signification) of the service system"* (Edvardsson et al. 2012).

In regards to technology, the "*innovative assembly of ICT as well as non-ICT resources*" is considered highly relevant (Srivastava and Shainesh 2015) in service systems. As technology is considered a "*game changer*" for services (Ostrom et al. 2015), many contexts that have been studied without an IT perspective might need adjustments for the new digital settings and platform structures. Inter-organizational service delivery systems as well as technology- and ICT-enabled platforms and ecosystems have been studied in several contexts (Barrett et al. 2015), but these digital infrastructures as the basis of successful service systems need further consideration (Henfridsson and Bygstad 2013).

From a process perspective, the current body of literature on service design and service systems engineering provides mainly two categories of multidisciplinary design methods - first, human-centered methods, which focus on the customer's expectations and experiences; second, methods for modelling, prototyping, and enacting, which focus on the design, visualization, and evaluation of activities and interactions of participating stakeholders and resources (Holmlid and Evenson 2008; Morelli 2002; Morelli 2006; Vasantha et al. 2012). The results of designing service systems are artifacts such as prototypes that show a detailed representation of the respective value proposition and value creation (Teixeira et al., 2016).

In terms of organizational aspects, one of the most important aspects is the definition of roles the different actors in a service system take, because that is how their interplay, co-creation is configured so that the service system's overall value propositions and success is determined. In this context, sservice systems are supposed to adapt to value propositions through the configuration of actors and resources which are determined by the service architecture (Böhmann et al. 2014). Further, these service architectures also determine system-wide properties of service systems such as speed (Alter 2008). So far, no service system design exists that is capable of handling multiple speeds as being relevant in case incumbents are co-creating value with

startups. Accordingly, service systems can be conceptualized as "*complex socio-technical systems that enable value co-creation*" (Böhmann et al. 2014). As actors are people and those who are involved in the process of interactive value creation with their knowledge and skills (Maglio et al. 2009), this is how the four considered categories of service systems people, processes, IT and organization are connected.

**Crowdlending Service Systems**

Crowdlending can be described as collective funding of loans by an undefined group of capital givers, where capital seekers and the crowd of capital givers are directly interlinked via an crowdlending intermediary by means of an Internet-based open call (Belleflamme et al. 2014). Following this thought in crowdlending the task of funding is outsourced to the crowd of capital givers (Moritz and Block 2014). Thus, funding activities are no longer restricted to financial institutions such as banks, but opened up to the public, such that anybody can participate according to their individual financial and mental capabilities. Thus, the roles of customers and suppliers become blurry (Rong and Shi 2014; Williamson and De Meyer 2012), while on the other hand network effects became crucial (Belleflamme et al. 2018). Thus, crowdlending represents an profit-oriented archetype of crowdfunding based on loans for capital seekers and interest as compensation for capital givers (Haas et al. 2014).

Previous research on crowdfunding mostly investigated behavioral decision-making patterns of capital givers and seekers, e.g., herding or signaling effects (Agrawal et al. 2010; Berns et al. 2018; Burtch et al. 2013b; Hornuf and Schwienbacher 2018), their motivation (Gerber et al. 2012), beneficial characteristics (e.g., race) (Lin et al. 2014; Wang and Greiner 2011; Younkin and Kuppuswamy 2017), or their roles and activities within crowdfunding projects (Hui et al. 2013; Ordanini et al. 2011). The second main stream of research focuses on crowdfunding projects, e.g., factors that influence the funding success including social and personal networks (Lin et al. 2013), project presentation (Mitra and Gilbert 2014b), the offered incentives (Hildebrand et al. 2017), or the dynamics of crowdfunding projects (Mollick 2014; Schwienbacher and Larralde 2012). Additionally, certain authors investigated risks associated with crowdfunding (Burtch et al. 2016; Siering et al. 2016) or fraudulent behavior (Cumming et al. 2016; Siering et al. 2016). Further, researchers tried to investigate the benefits of crowdfunding for gaining market insights and engaging the crowd in the product development process (Chemla and Tinn 2018; Viotto da Cruz 2018).

Despite the popularity, the potential, and the rising range of crowdfunding services and applications, research on crowdfunding is still at the beginning. Especially research on the systematic design of crowdfunding has been very limited. Most notably, Wieck et al. (2013) investigate how information systems for crowdfunding services can be developed, piloted, and evaluated. Besides, some authors aimed at systematizing crowdfunding services (Belleflamme et al. 2013; Bradford 2012; Haas et al. 2014; Massolution 2013). By taking a process perspective, Tomczak and Brem (2013) conceptualized an investment model of crowdfunding by using process modeling technique.

In particular crowdlending has enormous disruptive potential due to its proximity to the traditional banking industry. Due to the direct peer-to-peer intermediation of capital givers and capital seekers crowdlending reflects a disintermediation of the funding process, as no central institution is needed in order to provide the capital. However, due to prevalent transaction costs – e.g., by the collection of multiple micropayments and the micro repayments – and information asymmetries – e.g., due to the occurrence of information hiding, manipulation, and fraudulent behavior information (Ahlers et al. 2015; Burtch et al. 2016; Cumming et al. 2016; Siering et al. 2016) – intermediaries in crowdfunding are still essential (Bakos 1991; Bakos 1998; Cumming and Zhang 2019; Fehrer and Nenonen 2019; Lin 2015; Mahadevan 2000).

Thus, banks today already have competences, which are necessary to engage in crowdlending, e.g., account management and payment provision. In particular, for incumbents of the banking industry crowdlending can be considered an emergent business opportunity for the utilization of niche markets by building on a modular service system structure (Liebenau et al. 2014). Within a service system, incumbents and partners can bundle their competences to a consistent crowdlending service provision (O'Sullivan et al. 2002). Following the argumentation from service science literature, a CSS can be decomposed into its constituting components such as people, organization, processes, and technologies. Knowledge about these components, their exchange relationships, and inner workings is crucial for systematically designing CSSs comprising multiple people and organization (Baida et al. 2004; O'Sullivan et al. 2002).

## METHODOLOGY

### Applying Action Design Research to develop a Theory of Design and Action

A Theory of Design and Action (Design Theory) provides explicit prescriptions in the form of e.g., methods, techniques, or guidelines for the effective and feasible design of artefacts (Gregor 2006; Gregor and Jones 2007; Walls et al. 1992). A theory of design and action allows for the systematic specification of design knowledge (Gregor and Jones 2007). This is especially valuable in the context of our research project of designing a crowdlending system together with a fintech startup as it is based on insights from the field and the related literature regarding crowdlending and service systems. This allows for the abstraction to a broader class of problems – how to design service systems as an incumbent together with a startup. The systematic development of design knowledge in form of a design theory represents a valuable contribution for both academia and practice (Giessmann and Legner 2016; Gregory and Muntermann 2014). We follow an action design research approach (ADR), introduced by Sein et al. (2011) in order to develop an initial draft for a nascent design theory for crowdfunding service systems. ADR follows the four interrelated phases of (1) Problem Formulation, (2) Building, Intervention, and Evaluation (BIE), (3) Reflection and Learning, and (4) Formalizing of Learning. For the presentation of the formalized design knowledge we follow the recommendations by Gregor & Jones (2007).

ADR has shown to be a valid method for generating prescriptive design knowledge by developing, evaluating, and reflecting ensemble IT artifacts within organizational research contexts (Giessmann and Legner 2016; Sein et al. 2011). In the course of ADR, a practical concern of people in an immediate problematic situation is addressed by designing a problem solution and piloting this solution as a measure of intervention for this problem. ADR aims at both, making theoretical contributions and providing assistance for the in-field problem-solving of practitioners (Benbasat and Zmud 1999; Rosemann and Vessey 2008). ADR supports the creation of prescriptive design knowledge by analyzing the continuing adaptation of the artifact and the practices of its use, but also by the generalization upon the results of these analyses. ADR comprises an inductive reflection process, which can be formalized into a design theory (2013). As ADR addresses the intersection of IT and social environment it is suitable approach for the design of artifacts that constitutes a bundle of IT-based mechanism embedded in a social environment (Sein et al. 2011).

**Action Design Research Context**

To shed light on the design of CSSs, we started a research project with a large Swiss bank in December 2013. The bank had scouted crowdfunding for some times, but struggled to find a profitable and valid way to systematically make this new way of funding accessible and to design an own crowdlending service offering. Therefore, an interdisciplinary project team was set up consisting of researchers specialized in crowdlending and service engineering and bank executives specialized in innovation management and banking services. By considering a partnering approach together with a startup, the bank was able to successfully enter the crowdlending market in December 2016.

Our research approach follows the four steps of ADR, as indicated in Figure 22. Within the first step of ADR, we formulize the bank's problem, identify and analyze the related literature, and elaborate the class of problems. Within the second step of ADR, we conduct three design iterations – Initiation, Conceptualization, and Realization – in order to design the banks CSS. Parallel to these steps, we conduct a reflection and learning step, which moves conceptually from building a solution for a particular instance to applying the lessons learned to the broader class of problems. In the fourth step, we formalize these respective learnings and describe a theory of design and action in the form of a design framework, which supports incumbents throughout the systematic design of CSSs with a partner from the digital world.

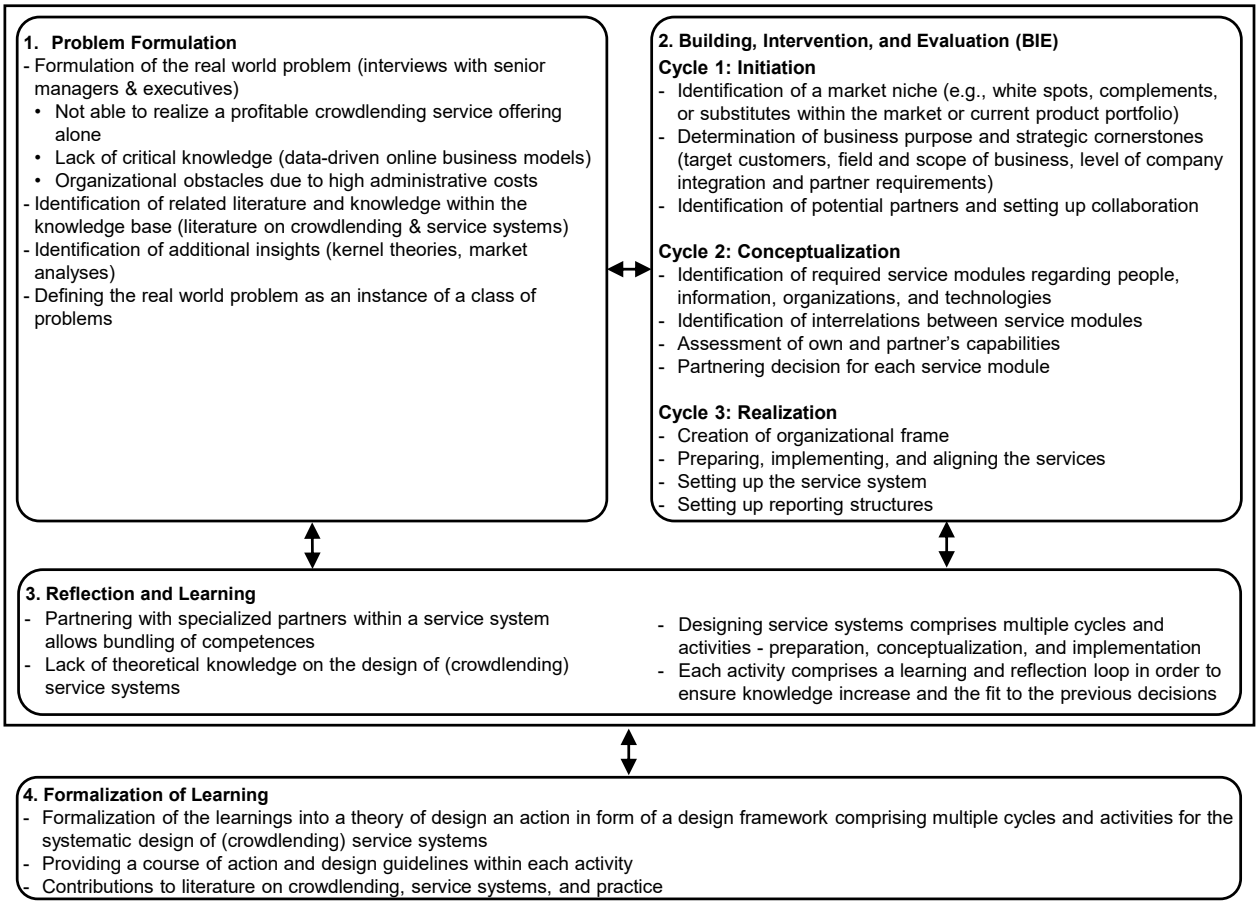



*Figure 22: ADR Approach*

## THE COURSE OF THE ADR PROJECT

### Problem Formulation

In a first step, we clarified on the bank's challenges with engaging in digital platform business. Therefore, we conducted informal interviews with three senior executives in order to get insights into the bank's previous crowdlending considerations and attempts. The results indicated that the bank previously tried to engage in crowdlending two times. Both attempts followed a do it yourself approach and failed in early conceptualization stages. No profitable business case has been developed due to the lacking critical knowledge regarding online platform business within the bank and due to the high internal administrative and operational costs. Thus, they failed to overlook and cope with the complexity of crowdlending.

Next, we reviewed existing knowledge in order to inform the design of a potential problem solution. Therefore, we reviewed the available crowdlending literature. The review revealed that crowdlending comprises a complex system of interconnected intermediary services, which enable the interaction between capital seekers and capital givers and support successful matchmaking, flow of capital, goods, and information (Belleflamme et al. 2014; Mollick 2014; Wei and Lin ; Zvilichovsky et al. 2013). As banks lack critical competences (Liebenau et al. 2014), collaborating with established crowdlending partners might help to overcome shortcomings regarding crowdlending specific knowledge and expertise. However, as crowdlending is a highly dynamic, differentiated, complex, and context specific phenomenon, existing solutions can't be simply copied, but must be carefully adapted to the specific context. Thus, intense exchange between the incumbent and a partner is needed, in order to design a CSS, which leverages on the expertise of both worlds – traditional & reliable banking and agile, innovative and digital fintech business. As the question of how to enable the mutual design activities between an incumbent and a partner has been largely neglected in the crowdlending literature so far, we extended our scope of literature to the general design of service systems. However, no systematic process for the joint design of service systems has been published so far. Thus, the mutual systematic design of service systems between an incumbent and a startup partner can be defined as a class of problems.

The review of the related literature and the inputs from the bank enabled us to develop a first impression of possible solutions. Therefore, we are aiming to develop an overarching process that captures all activities that are required to design a service

system as an incumbent together with a startup. In this vein, we aim at formulating respective learnings and a course of reflection and decision making for each process steps.

**Building, Intervention, Evaluation (BIE)**

Building on the problem formulation, we develop, pilot and evaluate the CSS together with the bank by running three BIE cycles.

***Cycle 1 – Preparation***

Building & Intervention

The preparation phase (cycle 1) aims at the identification of a proper market niche (e.g., white spots, complements, or substitutions within the market or current product portfolio). Therefore, we conducted comprehensive market analyses (e.g., PEST, SWOT, and competitor analyses). Additionally, a workshop session with bank representatives from different departments was carried out in December 2013 (N=10), in order to identify market segments that could not be served with the bank's existing service offerings and which might be profitable addressable by means of a crowdfunding service system. Market and literature analyses, workshop results as well as additional six interviews with three senior executives with expert knowledge of banking products, one Swiss self-employment consultancy, as well as representatives of two crowdlending platforms, indicated the same potential market segment – business loans for self-employed and small to medium sized businesses from CHF 10'000 to 150'000. A significant body of research identified liquidity constraints and insufficient access to capital as the most prevailing threat for small and medium-sized businesses (Evans and Jovanovic 1989; Holtz-Eakin et al. 1993; Johansson 2000). Afterwards, a project team was commissioned in order to develop a solution space based on the previous findings (see Table 21). The solution space comprises six specifications of strategic cornerstones.

***Table 21: Strategic Cornerstones***

| **Strategic Cornerstone** | **Description** |
|---|---|
| Business focus | Provision of small business loans |
| Core objectives | Establish a sustainable non-interest-related sources of income, which complements the current product portfolio |
| Desired added value | Positive image effects for the bank regarding the bank's innovativeness and digital leadership |

| | |
|---|---|
| Level of organizational integration | Striving for a maximum of organizational independency of the service system from the bank (e.g., rather stand-alone in form of a joint venture; with the opportunity for the bank to up- and down-scale the bank's engagement) |
| Level of operational involvement | No operational integration of bank's business processes (e.g., no consolidated supervision; no service provision by the bank besides standard bank processes; co-branding with bank's logo is allowed) |
| Partner requirements | Successful and established crowdlending business model; German-speaking; experiences with foreign markets; positive image |

In a final step of the preparation phase, a long list of potential partners was screened and reduced to a short list comprising three potential partners. After a first round of noncommittal meetings, the most promising partner was identified and the collaboration for the following development of the CSS was set up. This included legal agreements on the general intention for the collaborative development of the CSS for the provision of small business loans in the Swiss market, mutual exclusivity, and openness regarding business models and operational knowhow, and clauses for the case of a failure of the collaboration.

Evaluation of the Preparation Phase

The evaluation of the preparation phase is threefold - Evaluating the market niche, evaluating the strategic cornerstones, and evaluating the choice of partner. Therefore, a focus group workshop with three senior executives from the bank' product management with in depth knowledge about the customers, the loan market, and the bank's operational capabilities was conducted in March 2014. The findings regarding the market niche, the solution space, and the choice of partner have been presented to the focus group. The focus group was asked to assess the findings validity, accordance to the bank's strategy and intentions, and feasibility based on resources and capabilities. The focus group confirmed the increasing demand of the capital seekers for alternative forms of funding with independency against banks (e.g., fewer securities necessary, no loss of control), less bureaucracy (faster and more transparent decision-making), higher flexibility (quicker payment dates), and the access to capital for niche markets, which are not served by banks. In this sense, they validated small to medium companies as a suitable target group, as they experience major obstacles,

when applying for loans via traditional ways of funding. These are caused due to the high risk, low profitability, and the high administration costs. Anyhow, this target group represents a desirable market niche, due to its economic importance and high potential for up- and cross-selling. Therefore, crowdlending was evaluated a viable approach for complementing the bank's product portfolio. Due to the lack of experience with crowdlending and its impact in the financial service industry with regard to reputation and disruption, the proposed reduced initial operational involvement and the low level of organizational integration was evaluated an ideal approach for managing the reputational risks for the bank. Therefore, the focus group evaluated engaging with an experienced partner a solid approach to achieve the core objective and the added value. Thus, the evaluation of the focus group was rather positive, and therefore, the advancement of the project was decided.

***Cycle 2 – Conceptualization***

Building & Intervention

The conceptualization phase (cycle 2) aims at designing the CSS by building on and learning from the partner's business model, experiences, and operational knowledge in order to overcome the complexity of the CSS. In order to enable the mutual design of the CSS, the project team was extended by representatives of the startup. Thus, the CEO (as an expert of the business model), the General Counsel (as an expert in legal and regulatory issues), and the Head of Business Development (as an expert of market development and internationalization) joined the project team. In order to overcome the complexity and successfully adapt the partner's expertise to the specific context, certain methods were applied to the partners existing CSS. In order to analyze the customer's expectations (customer journeys, storytelling), and for identifying the required services regarding people, information, organizations, and technologies as well as the interactions between the services and stakeholders.

As services are a set of processes being part of the interactions between the components of service systems (Chesbrough and Spohrer 2006; Peters et al. 2015b), a process perspective was taken first in order to identify the service modules. We applied "Business Process Model and Notation" (BPMN 2.0) (Dijkman et al. 2008; White 2004) and Service Blueprinting (Fließ and Kleinaltenkamp 2004) in order to model the level of customer involvement. Thereby, we were able to identify the stakeholders, involved in the service provision. Second, we aimed at deriving the respective service modules. Therefore, we grouped all processes according to their respective owner ("who is responsible for the execution?"), their proximity ("how

similar are the tasks and objectives of the processes?"), and their level of customer involvement ("how close are capital seekers and capital givers involved in the process?"). The analyses led to the identification of twelve constituting service modules, which form a CSS (see Table 22).

***Table 22: Overview of Services***

| **Service Modules** | **Description** |
|---|---|
| Matchmaking | An e-market place is operated in order to interconnect capital seekers & givers, create thick markets, to provide information, and to register funding decisions. |
| Contracting & Compliance | After the funding goal is reached, automatized and standardized online contracting is provided in order to ensure legal liability and compliance. Until the full repayment of the capital the compliance to the contract is tracked and assessed. |
| Customer Support | Crowdfunding is a more unbureaucratic way of funding. Therefore, certain activities are performed to enhance the customer relationship in order to overcome initial barriers, to clarify customer issues, and support the customer journey of capital givers and capital seekers. |
| Risk Assessment | Crowdfunding services rate risks related to the capital seeker by tracking credit-, trustworthiness, and project history. Traditional forms of risk scoring are extended by analyzing additional behavioral information (time tracking, project description). |
| Authentication | In order to meet legal regulations (Know Your Customer – KYC), prevent fraud, and reduce risks for capital seekers and givers, crowdfunding services apply comprehensive online identification and authentication processes. |
| Crowd Activation | Crowdfunding services perform the attraction, activation, and balancing of the 'right' crowd in order to ensure funding success, attractive returns and to generate network effects. Therefore, promotional activities (especially via social media) are performed. |
| Investor Relations | Crowdfunding is a more transparent and democratic way of investing. Therefore, certain activities enable instant and constant communication between the capital seekers and capital givers in order to extend the investment engagement of capital givers (e.g., performance and quality tracking of projects or investment |

| | |
|---|---|
| | portfolios). |
| Payment Processing | To enable a fast, reliable, and efficient flow of money between capital seekers and givers as well as the skimming of the platform fees, automatized (online) payment functionalities are provided. |
| Banking | Banking services for inter alia account management, the credit processing, the collection and provision of the capital (Pooling), and exclusive access to credit information are implemented. |
| Dunning & Debt Collection | In case of debt default effective dunning and debt collection services are needed in order to prevent or minimize the risk of investment losses. |
| IT Operations | The service provision of the CSS is enabled by a high level of interconnectivity and exchange relationships between the service modules. All service modules are characterized by a high level of automation and enabled by sophisticated IT support. |
| Corporate Development | By taking a management perspective, the orchestration between the service modules as well as the creation of an organizational and operational frame for a consistent service provision is crucial for a functioning and success service system. |

Further, the service modules were grouped according to their business function within the value creation of the service system. Therefore, we assessed, whether the service modules support Management, Service (including Sales, Operation, Transaction-related, Cross-Transaction Activities), or Supporting Activities (Alt et al. 2009) (see).

Table 23).

***Table 23: Business Function of Service Modules***

| **Activities** | | **Service Modules** |
|---|---|---|
| Management Activities | | Corporate Development |
| Service Activities | Sales Activities | Crowd Activation |
| | | Customer Support |
| | | Investor Relations |
| | Operation Activities | Matchmaking |
| | | Risk Scoring |

| | | |
|---|---|---|
| | | Contracting & Compliance |
| | Transaction-related Activities | Payment Processing |
| | | Dunning & Debt Collection |
| | Cross-Transaction Activities | Executing Banking |
| | | Authentication |
| Supporting Activities | | IT Operations |

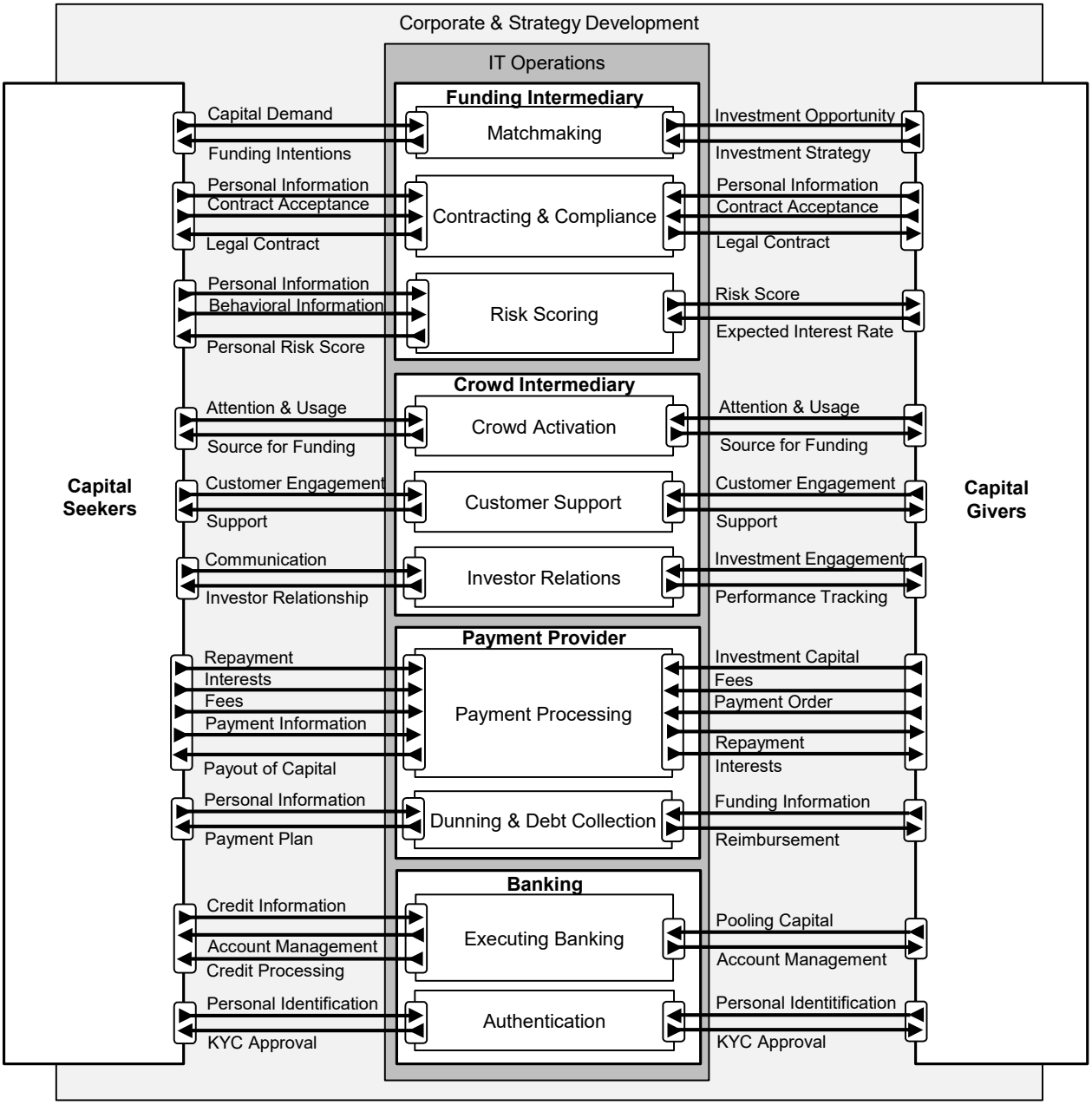
Two service modules – Corporate Development and IT Operations – focus on the surrounding environment, while the others are part of the core value creation. By considering their respective position within the value creation and their responsibilities, we derived four separate roles, which have to be assumed in order to enable the service provision within the CSS (see Table 24). Each role bundles a set of similar service modules, which require similar competences. Therefore, these roles represents a logical structure for determining responsibilities within a service system and making outsourcing decisions.

***Table 24: Roles within Crowdlending Service Provision***

| **Role** | **Service Module** |
|---|---|
| Crowd Intermediary | Crowd Activation |
| | Customer Support |
| | Investor Relations |
| Funding Intermediary | Matchmaking |
| | Risk Scoring |
| | Contracting & Compliance |
| Payment Provider | Payment Processing |
| | Dunning & Debt Collection |
| Banking | Executing Banking |
| | Authentication |

Following, we modelled the service system, by using e3 Value (Gordijn 2002) modelling technique. Therefore, we modelled the various value exchange relationships between the roles and capital seekers and givers, regarding the respective service modules (see Figure 23).

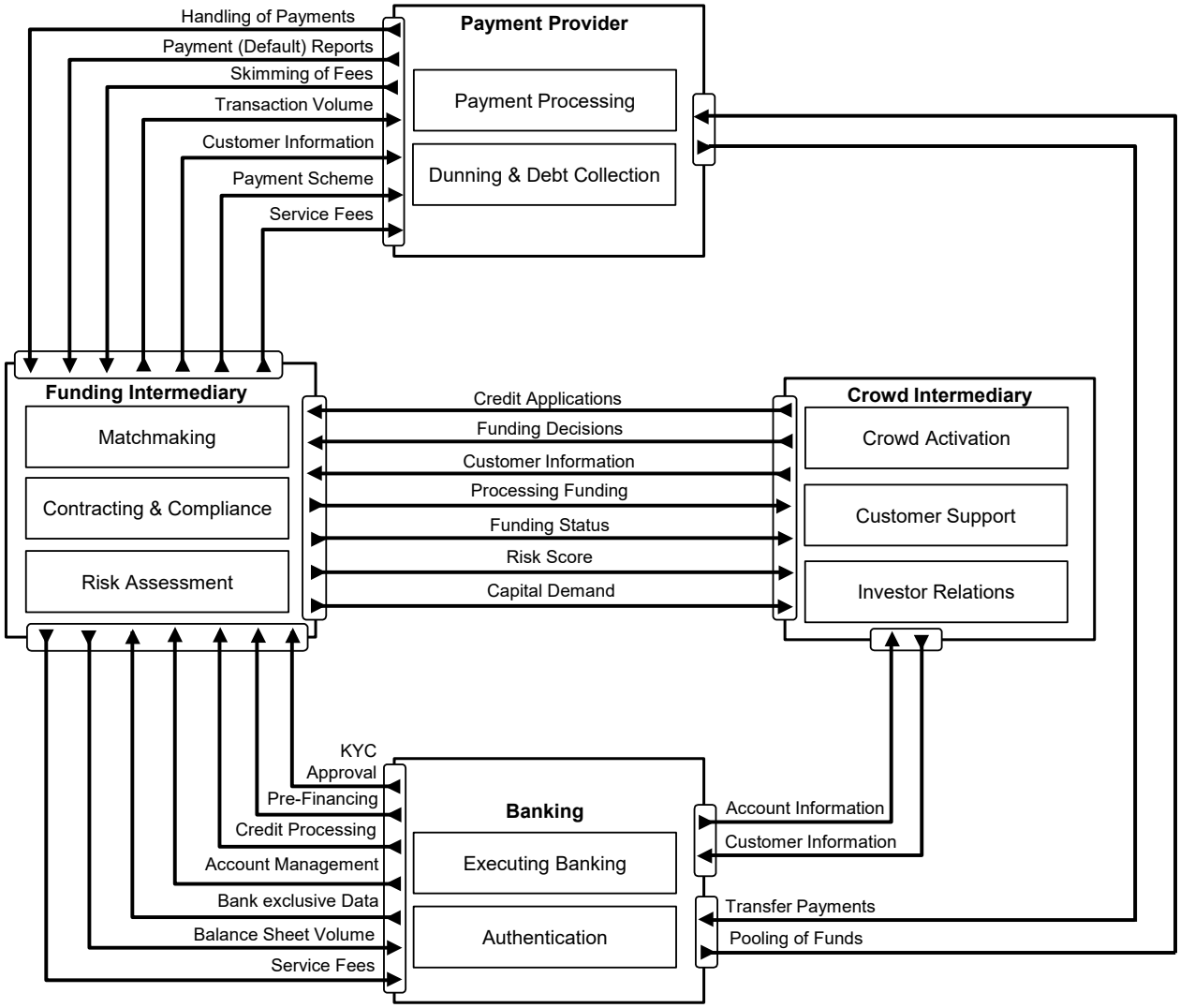
***Figure 23: Customer Exchange Relationships***




Nevertheless, the interaction between the roles, in order to fulfill the service provision, remains rather a black box. Therefore, we modelled the value exchange relationships between the roles, considering the comprising service modules (see Figure 24). This modelling turns the black box into a white box and reveals the high complexity and interconnectivity of the service system. It also indicates the required high degree of

specialization of the single roles in order to enable the service provision of the respective service modules. Even though, all roles are necessary in order to enable the service provision within the CSS, the role of the Funding Intermediary seems to be the most pivotal role. The Funding Intermediary role orchestrates the overall service provision, while the other roles take over supporting roles.

***Figure 24: Value Exchange Relationships between Roles***




The derived roles and the respective crowdfunding services are assessed whether they have the potential to be performed by the bank itself based on skills, experiences, legal necessity, power to act, and strategic objectives. Therefore, interviews and workshop settings with experts from different departments (e.g. risk management, compliance, business development, product management and marketing) are conducted. Services, which are new and beyond the experiences, competences, or strategic objectives of the bank, need to be performed by the partner or a third party. Thus, by conducting detailed negotiations between the bank and the startup, a partnering decision was made

for each service module, resulting in the final conceptualization of the CSS. The bank decided only to oblige to the Banking role.

Evaluation of the Conceptualization Phase

The evaluation of the conceptualization phase focusses on completeness and organizational and legal compliance. Therefore, in a first step we evaluated the completeness of the identified service modules comparing the list of the identified service modules with 26 crowdlending platforms, which were identified by an online search. The online search was conducted via Google between March and October 2016. Search criterions included that the CSS: 1) is active; 2) is in German or English language; 3) provides the necessary information on the website; and 4) can be assigned to crowdlending (e.g., by using the terms like "crowdlending", "Peer-to-Peer-Lending, or "Social-Lending". By reviewing the provided information regarding the crowdlending processes, we identified a very high homogeneity in the operated service modules and executed roles, which indicates a high level of completeness. However, large variations of the processes and the involved partners exist on a micro level most due to different legal requirements (e.g., personal vs. digital authentication, formal necessity of banks as financial intermediary, or degree of automation and digitization of contracting).

The conceptualization of the crowdlending services system was evaluated formatively by two focus group workshops with senior and top-level executives. Both positively evaluated the organizational compliance of the service system to the bank's strategy and competences, its expected profitability and positive image effects, as well as its stand-alone capability. Further, Swiss Financial Market Authorities positively assessed the legal accordance of the proposed service system.

***Cycle 3 – Implementation***

Building & Intervention

After the conceptual approval of the banks and the start up's executive and supervisory boards the implementation phase (cycle 3) started by setting up the organizational frame. Therefore, building on the previous negotiations between the bank and the startup, a joint corporation was founded. As these negotiations were mostly performed by legal advisors, which haven't been involved so far, conflicting views, which have been avoided so far, came up. Thus, formalizing the conceptualization on a contractual level represents a critical point, which can be avoided by creating a sense of togetherness, early involvement of legal experts, addressing critical topics during the

conceptualization phase, and provide and comply effective decision-making processes on both sides. Additionally, reporting structures were defined, by identifying the relevant stakeholder's within the bank and their respective strategies and objectives. Afterwards KPIs have been derived and transformed into a balanced scorecard, which was implemented by defining reporting processes and determining the people in charge. The regulatory approval was obtained by the Swiss market authorities. Finally, the organizational framing has been approved by the bank's executive board and supervisory board. Therefore, the final concept and the organizational framing have been presented and discussed in November 2016.

In order to setting up the service system agile methods were applied. Thus, the service modules were implemented and the service system was set up by aligning and interlinking the single services. In this vein, the CSS was transferred from the project phase to normal operation. Thus, the responsibilities were transferred from project team to the operating staff. Besides, marketing activities started in order to attract pilot capital givers and seekers. Afterwards, the CSS became operational and started its open beta-phase with a limited number active capital seekers from January to March 2017.

Evaluation of the Implementation Phase

The evaluation of the Implementation phase focusses on the performance of the CSS and the outcomes of pursuing a partnering approach for the systematic exploitation of digital innovation in general.

Therefore, the results of the open-beta phase have been critically assessed. Due to the ex-ante marketing activities, a total of 80 capital seekers with a demanded capital volume of Mio CHF 3.5 applied on the website for a loan. By applying the risk scoring processes six pilot capital seekers with a total volume of ca. CHF 300'000 have been approved for applying for a loan throughout the open-beta phase. 100 percent have been funded within a 2-3 weeks period only by private capital givers followed by successful contracting and payout. So far, no repayments continue as planned with no debt defaults. The findings of the open-beta phase indicate an excellent performance of the CSS and the constituting service modules. Due to the success of the open-beta phase, the final go-live was approved in June 2017.

Besides, the project sponsor was interviewed with regard to the general satisfaction with the partnering approach and the impact of the project. The interview was conducted in May 2017 by telephone. The expert has been asked questions about the

overall satisfaction regarding the project in general, the outcomes, and the partnering approach.

The answers revealed that the project's impact exceed the initial expected scope, as it has built awareness for the need for a cultural change in order to be capable for the new competitive arena of digital business. Therefore, partnering becomes a necessity not only to keep pace with new competitors but also to exploit new markets and opportunities. Therefore, the bank's culture, competences, IT infrastructure, business processes, and resources have started to be reorganized in order to empower the mutual exploration of new topics of interest with external partners. Thus, the project's contribution not only comprises the development of a CSS, but a deep impact in the bank's future strategy.

**Reflection & Learning**

Parallel to both, the Problem Formulation and the BIE activities, this step moves conceptually from building a solution for a particular instance to applying that learning to a broader class of problems – how to systematically enable the design of service systems between an incumbent with a startup. Thus, the step focuses on reflecting the results of the Problem Formulation and the different BIE cycles. Reflections and learnings regarding the Problem Formulation phase illustrated the necessity to collaborate with a specialized partner within a service system in order to bundle competences and revealed the lack of theoretical knowledge regarding the systematic design of service systems. Reflections and learnings regarding the BIE phase revealed that designing service systems comprises multiple design cycles and activities. Each activity revealed respective lessons learned, which can be translated into prescriptive design guidelines. Further, each activity comprises learning and reflection loops in order to ensure knowledge increase and the fit to the previous design steps.

**Formalization of Learning**

In the final step of ADR, the learnings are consolidated in order to provide contributions to the respective class of problems of how to design CSSs. Therefore, we developed an initial draft for a theory of design and action (Gregor 2006; Gregor and Jones 2007) in form of a design framework for the systematic design of CSSs. In order to develop the framework, we started by preparing the initial course of action. Therefore, we reflected the conducted activities within each of the three design phases – Initiation, Conceptualization, and Realization. Three researchers independently grouped them according to the activities' common theme, in order to identify the five

design steps. After the consolidation of the design activities into a consistent design process, we conducted expert interviews with four involved senior managers of the bank (Innovation Management, Project Management, General Counsel, and Corporate Venturing) and the Business Development Manager of the startup in order to collect their feedback on the process and their experiences regarding each design step. Their statements identified specific lessons learned regarding each design step as well as the necessity of a reflection loop after each design step, in order to assess the outcomes' fit to the initial requirements, objectives, and potentials.

**Evaluation of the Theory of Design and Action**

In order to evaluate the proposed design framework as an initial step for a nascent theory of design and action, we conducted five interviews with experts, which already participated in the design of a service systems, where an incumbent collaborated with a partner from the digital world. All experts came from different contexts, which ensures good generalizability of the results (see Table 25). The interviews were held face-to-face, via Skype, and telephone during May 2017.

***Table 25: Overview Experts***

| Expert | Context of Service System | Incumbent | Partner from the digital world |
|---|---|---|---|
| #1 | Crowdlending of SME loans | Bank | Crowdlending platform provider |
| #2 | Business model innovation | Software provider | Ideation platform provider |
| #3 | Crowdfunding for startup incubation | University accelerator | Crowdfunding platform provider |
| #4 | Crowdsourced software testing | Insurance company | Crowdtesting platform provider |
| #5 | Platform-based intermediation of human-centered services | Care service provider | Intermediation platform provider |

First, the experts were asked to report about their design approach, their course of action, and respective lessons learned. Thereby, all experts confirmed the three phases of Initiation, Conceptualization, and Realization. Afterwards, the proposed nascent theory of design and action, respectively the design framework, was presented step by step and the experts were asked to give feedback regarding comprehensiveness, usefulness, and applicability.

The experts evaluated the design framework to provide major support for the systemization of the design approach and valuable insights on the critical obstacles in order to ensure an effective and efficient design. The experts mentioned that the lack of a systematic design approach led to repeated distractions of the design activities, significant delays and a waste of money and resources. The experts rated the design framework to enable a more focused and thoughtful design. Following, a mutual design approach together with a partner from the digital world, was evaluated as the most efficient and effective way for the sustainable exploitation of the opportunities of new service systems. This approach allows leveraging mutual strengths and synergies. Further, the expert gave valuable comments for improving the comprehensiveness, which were carefully integrated in the final version of the design framework.

## THE CROWDFUNDING DESIGN FRAMEWORK

### Overview

Throughout the formalization of the learnings, we consolidated the experiences regarding the design process. In the style of our research approach with the three BIE phases Initiation, Conceptualization, and Realization, we were able to identify a systematic design framework for the design of CSSs. This framework comprises a systematic design process of five interrelated design steps - Preparation, Partnering, Exploration, Design, and Implementation. Additionally, each step comprises a reflection loop, which helps to reconsider the fit to previous requirements, assumptions and objectives. Finally, for each design step respective lessons learned are presented, which represent prescriptive design knowledge and illustrates a course of action for the successful design of CSSs. An overview of the CSS design framework can be seen in Figure 25.

The CSS design framework represents an initial step for the development of a nascent *"Theory of Design and Action"* (Gregor 2006; Gregor and Jones 2007) as it provides explicit design knowledge in the form of a five stage design process, accompanied by a course of action and respective lessons learned for the design of CSSs (Gregor 2006; Gregor and Jones 2007; Walls et al. 1992). It is not the aim of the proposed design framework to provide a comprehensive methodological toolbox for each design step individually, but to present an overarching design process and specific lessons learned for supporting the systematic and effective design of CSSs. Therefore, the proposed design framework propagates the early integration of potential partners (e.g. startups), in order to enable mutual learning and the exploitation of an optimum of synergies.

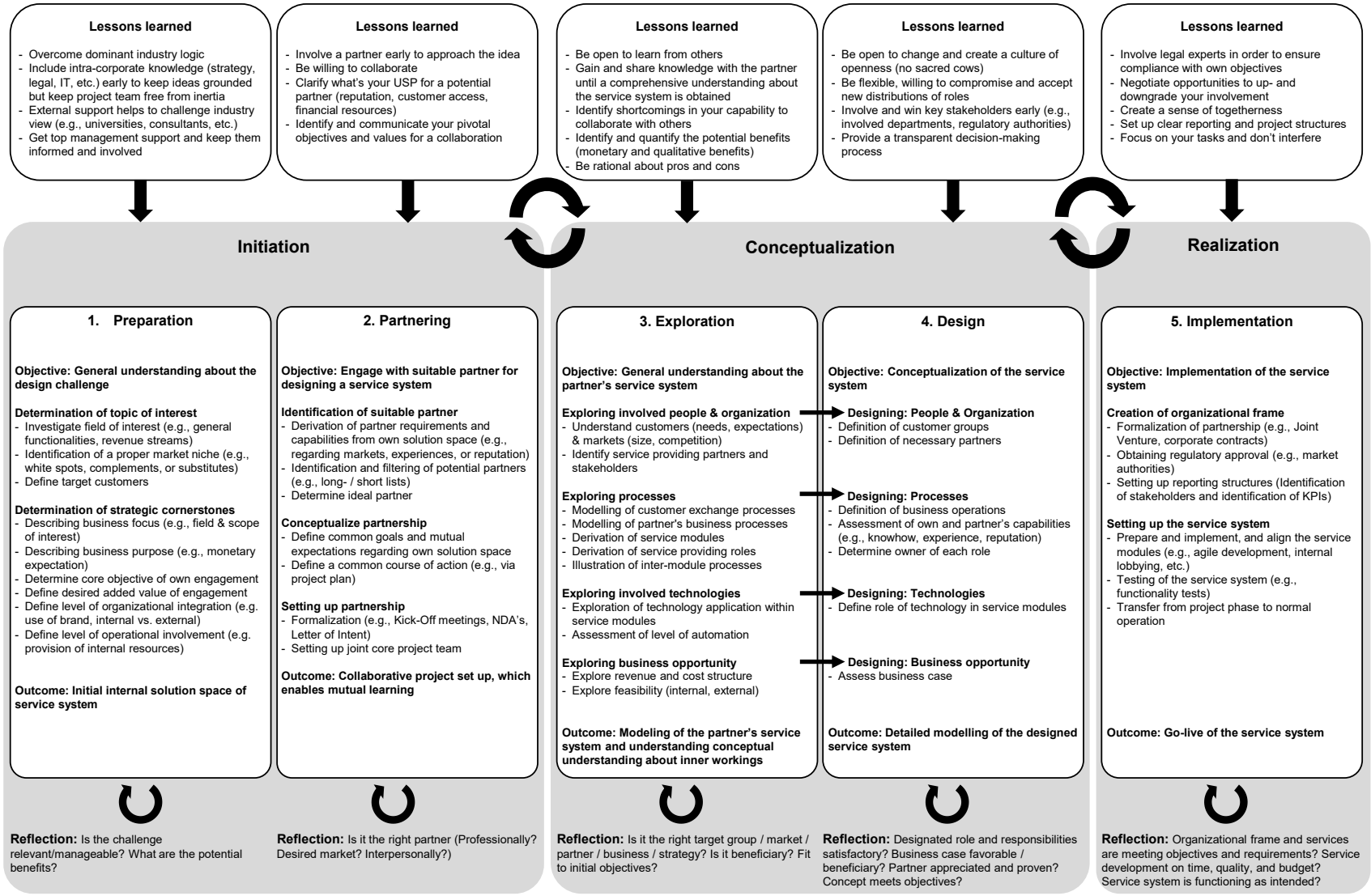



*Figure 25: Overview Service System Design Framework*

**Initiation Phase**

The Initiation Phase is the starting point for an incumbent, which plans to systematically design a service system with a partner from the digital world. This phase comprises two design steps – 1. Preparation and 2. Partnering. The objective of the initiation phase are to get a general understanding about the design challenge and the engagement with an appropriate partner for the design of the service system.

***1. Preparation***

The initial detection of a topic of interest, which should be approached together with a partner from the digital world is the prerequisite of the proposed design process. This general interest in the phenomenon has to be transferred into an actual market definition. This market definition has to identify a proper market niche, e.g., by identifying white spots, complements, or substitutes within the market or the current product portfolio. Thus, specific customer groups have to be identified in order to keep the design focused. Besides, strategic cornerstones have to be defined during this step. Therefore, it is crucial to determine the specific business focus and the business purpose, e.g., whether the service system aims at gathering experiences with digital online-business or whether monetary expectations are pursued. Throughout this clarifications, the core objective as well as the added value of engaging in the service system has to be determined. Further, it is necessary to determine the organizational integration of the service system and the level of the company involvement. Thus, decisions regarding how close the service system should operate next to current products (e.g., M&A, joint ventures, financial participation, or mere cooperation) and how deep the incumbents plans to be involved in the operational service provision (e.g., use of logo, customer data, strategic / operational infrastructure) should be defined.

Preparing the upcoming design steps is a though challenge, as it requires overcoming the dominant industry logic. The inclusion of external support like e.g., universities, consultants, etc. helps to include external and neutral experts and thus, challenge dominant industry or company views. However, in order to ensure the effectiveness of the design, it is necessary to keep the nascent ideas grounded. Therefore, it is helpful to consult broad intra-corporate knowledge and experts from different departments like e.g., strategy, legal, IT, etc. However, by relying too much on these experts might cause problems to overcome industry logics. Thus, the project team should be kept

free from inertia. Therefore, top management support is crucial in order to balance visionary thinking and grounding ideas.

After developing a general understanding about the market and the defined solution space of the pursued service system, the project team should reflect, whether the topic is actual relevant, whether the design challenge is manageable, and whether the potential benefits and opportunities meet the requirements and overweigh the potential threats. This reflection serves as basis for a decision of whether the design should continue to the next step, or whether it should be revised or terminated.

***2. Partnering***

If the preparation step was performed successfully, the next step focuses on identifying a suitable partner and setting up a collaboration, which enables the mutual design of the service system. Grouping together in such an early stage is useful in order to enable quick knowledge transfer, exploiting mutual synergies, and overcoming industry and company bonds. Therefore, in a first step, partner requirements have to be determined regarding the partner's current markets, business model, reputation, or previous experiences with e.g. internationalization, cooperation, or regulatory issues. Additionally, it is important to identify the own strengths, which potential partner's might desire to gain through a cooperation (e.g., reputation, customer access, customer base, financial resources, etc.), and what the own weaknesses are in order to bridge the gap. To know the own realistic value and to develop a strong value proposition for potential partners is crucial for achieving strong bargaining power. However, for many incumbents it is hard to accept that collaborating with growth companies make them the junior partner in the co-operation, as they barely have operational knowledge and are depending on the partner's knowledge. Based on the requirements potential partners can be identified by screening the market and a long list can be put together. By assessing the potential partners on the long list regarding additional requirements or a more fine grained analyses, a short list of a few suitable partner can be created. The potential partners on the short list should be prioritized and an initial contact established via a non-committal exchange in order to assess the fit to the intended strategy, pivotal objectives, and intentions and to identify the ideal partner.

After determining the ideal partner, the partnership should be conceptualized. Therefore, the incumbent's solution space has to be evaluated with the partner's expectations and revised if necessary. Following, common goals and a common course of action has to be defined. If both parties agree to the common intention, the

collaboration should to be formalized. Therefore, a joint project team comprising know-how on the market, business operations, regulation and compliance issues, and financial planning has to be set up and officially sworn in. In order to show mutual commitment and setting the boundaries of the collaboration Non-Disclosure Agreements (NDA) and a Letter of Intent (LoI) can be signed.

The progress throughout the partnering step should be continuously reflected, in order to assess whether it is really the right partner in terms of requirements, expectations, and shared intentions. Otherwise, a new partner has to be identified or even the own solution space revised. If the partnership has been formularized, the next design step can be approached.

**Conceptualization Phase**

The Conceptualization Phase builds on the results of the Initiation Phase and aims on actually developing the service system. This phase comprises two closely interrelated steps – 3. Exploration and 4. Design. Both activities follow the four elements of service systems – people, organization, processes, and technology. Thus, the objectives of the conceptualization are achieving a general understanding about operating a service system and its constituting elements, and afterwards, designing the service system.

***3. Exploration***

After setting up the partnership, the aim is to explore the partner's service system. In order to explore insights regarding people the partner's customers, their needs, expectations and requirements have to be analyzed. Following, this insights have to be transferred and validated at the target market, also considering the actual and potential market size, the competitive situation, and legal and regulatory situation.

In order to explore insights regarding organizations, the involved stakeholders of the partner's service system have to be identified.

In order to gain insights regarding constituting processes and the inner workings of the service system four steps have to be conducted. 1) The partner's business operations have to be explored by modelling all customer exchange and service processes. 2) By grouping the processes based on ownership ("who is responsible for the execution?"), their proximity ("how similar are the tasks and objectives of the processes?"), and their level of customer involvement ("how close are customer groups involved in the process?") a set of service modules can be identified. 3) By grouping the identified

service modules according to their business function within the value creation of the service system - management, service (including sales, operation, transaction-related, cross-transaction activities), or supporting activities – the constituting roles of the service system can be defined. 4) Finally, the inter-role relationships can be modelled in order to gain insights in the inner workings of the service system.

In order to explore the role of technology within the service system, the application of technology in each service module and the level of automation have to be assessed.

In order to ensure the effectivity of the exploration together with the partner, it is necessary to be willing to learn from the partner in order to acquire expert knowledge from the partner. In this vein, own shortcomings in the capability to collaborate with others and running a service system can be identified.

Insights regarding the business opportunity can be explored by analyzing the revenue and cost structure and conducting analyses regarding the internal (e.g., financial capabilities, monetary expectations, and available resources) and external (e.g., legal and regulatory issues) feasibility.

Throughout the reflection of this step, the conducted activities and assumptions so far should re-evaluated. In this vein, one should assess, whether the focus lies on the correct target group and market, and whether the right strategy and business objectives are pursued. Additionally, during achieving a comprehensive understanding about the design challenge and the service system it is necessary to reflect, whether it is still the right partner and whether it is beneficiary to further engage or not.

***4. Design***

During the final step of the conceptualization phase the actual design decisions of the service system is performed based on the gained knowledge of the exploration phase. Therefore, decisions regarding the explored four elements of service systems have to be made.

With regard to people and organization the precise customer groups and the necessary partner have to be defined. Concerning the processes and inner workings, the explored knowledge has to be transferred to the incumbent’s context and solution space. Therefore, the incumbent’s and partner’s capabilities regarding each service module have to be assessed based on strengths and weaknesses (e.g., knowhow, experience, and reputation). After assessing the capabilities and the alignment of the capabilities with the prerequisites, defined in the solution space, the optimal ownership of each

role has to be determined. In order to determine the ownership it is crucial to be willing to compromises, to create a culture of openness, and to accept new distributions of roles and operational influence. Further, design decisions regarding the role of technology in the service modules. In this way, an overall conceptualization of the service system emerges, which comprises all stakeholder, service modules, and exchange relationships. Building on this conceptualization, the business opportunity can be assessed, based on a business case, which serves as basis for the implementation of the service system. In order to ensure fast design progress, key stakeholders (e.g., internal departments, regulation authorities, etc.) should be kept informed and all participating stakeholders should provide transparency regarding their decision-making processes.

Throughout the reflection, it is necessary to ask oneself, whether the designated role and responsibilities are satisfactory and whether the proposed business plan is favorable and beneficiary regarding the own objectives. Additionally, the reflection loop should assess whether the designated partner is still appreciated and the expectations are proven.

**Realization Phase**

The Realization Phase comprises the final step of the service system design process - 5. Implementation. The Implementation step focuses on managing the go live of the service system.

***5. Implementation***

The final design step, focusses on the implementation of the service system. In this vein, the organizational frame has to be created. Therefore, the partnership has to be formalized by concluding the necessary contracts (e.g., joint venture or corporate contracts), obtain the regulatory approval by the market authorities, and setting up appropriate reporting structures. Thus, the collaboration ensures an effective, efficient and compliant service provision. Throughout the contractual negotiations the early involvement of experienced legal advisors is pivotal in order to enforce the conceptualized and intended design. However, the formalization of the conceptualized service system, remains a critical point, as crucial decisions have to be made regarding conflicting views, which have been avoided so far. This might cause revisions of the conceptualization and delays of the implementation process. In order to overcome differences (e.g., different expectations of strategies, roles and responsibilities) a sense of togetherness shall be created.

Besides the organizational framing, the services needs to be prepared, implemented and aligned in order to perform the service provision within the aggregated service system. Afterwards, the service system can be set up and tested. After agreeing to roles and the distribution of responsibilities every partner should focus on their tasks and don't interfere others, except through the agreed ways, which were defined in the organizational frame (e.g., the supervisory boards).

Throughout the reflection, the organizational frame and services needs to be critically assessed, whether they meet the own objectives and requirements. Further, the implementation and the service development itself needs to be reflected and evaluated with regard to time, quality, and budget. Finally, the service system needs to be evaluated, whether it is functioning as intended or not.

## CONCLUSION

### Contributions and Discussion

Our research objective was to develop an empirically based design framework as an initial step for the development of a nascent theory of design and action, which supports incumbents in designing service systems together with a partner from the digital world. In order to solve this class of problems, we conducted an ADR project to develop an instantiated solution based on the case of crowdlending in the financial service industry. We were able to design a CSS by pursuing a systematical and iterative design approach, which builds on the mutual exploration together with a crowdlending platform provider. By formalizing the reflections of each ADR step, we described the aforementioned initial step for the development of a nascent theory of design and action. Based on our research objective, this study presents two major theoretical contributions.

First, we contribute to crowdlending research by providing an illustrative case for the systematical design of an innovative CSS, which has been largely neglected so far. Our findings show that despite crowdlending reflects some kind of disintermediation in the financial service industry, due to information asymmetries and transaction costs intermediaries remain necessary (Bakos 1991; Bakos 1998; Cumming and Zhang 2019; Lin 2015; Mahadevan 2000). However, crowdfunding intermediation exhibit three fundamental differences compared to traditional financial intermediaries. (1) Funding decisions and activities are no longer reserved to professional financial institutions (e.g., banks or venture capitalists), but democratized by opening up to every individual with Internet access and the required financial ability (Belleflamme et

al. 2014). Anyhow the dynamics of capital giving on crowdfunding is consistent to traditional forms of funding with strategically acting capital givers looking for quality return with manageable risk (Berns et al. 2018). (2) They provide funding for projects that have limited access to traditional forms of funding due to high investment risk and/or low profitability expectations and that may reflect the long tail of the financial service industry (Liebenau et al. 2014; Schwienbacher and Larralde 2012). Crowdfunding intermediaries make extant use of information technology aiming at serving such projects profitable (e.g., co-creation based on web 2.0 approaches, big data analytics, or process automatization) (Haas et al. 2015). Thus, crowdfunding is based on platform principles, which bring network effects to the fore while other characteristics of traditional funding become less important (Belleflamme et al. 2015; Belleflamme et al. 2018). (3) As opposed to traditional financial intermediaries, crowdfunding intermediaries are not involved in the actual funding process. Crowdfunding intermediaries serve as matchmaker by linking capital seekers and givers directly and by enabling them to exchange capital and value for which they provide the technical or organizational infrastructure on an online platform and ensure quality of the proposed projects (Cumming and Zhang 2019; Fehrer and Nenonen 2019; Liebenau et al. 2014).

Therefore, we extend current research on the functional conceptualization of crowdfunding (Beaulieu et al. 2015; Belleflamme et al. 2014; Tomczak and Brem 2013) by considering crowdlending as a modular service system. Therefore, we decompose the CSS into service modules. The modular decomposition enables the bundling of traditional capabilities of a bank and the novel capabilities of external partners within a CSS, as suggested by Christensen and Raynor (2013). The modular perspective further reveals that crowdlending is not an entirely new way of financial service provision but due to IT and the Internet traditional service modules of financial intermediation (e.g., payment, banking) can be combined with novel service modules (e.g., matchmaking) effectively in order to create innovative CSSs. Thus, we identify twelve constituting service modules, which are performed by four service providing roles within the CSS. Further, we describe the service module on a process level, by modelling the exchange relationships, and business operations of the involved stakeholders, partners, and roles of CSSs. This in-depth insights in the modular structure and the inner workings of CSSs enables the exploitation of traditional modularization benefits such as flexibility, reuse, variability, and module-wide innovation (Böhmann et al. 2008).

Second, by reflecting and formalizing the single design steps and iterations the ADR approach enables us, to contribute to service science, which calls for *"research, leading to actionable knowledge for systematically designing, developing, and piloting service systems"*, for a multi-stakeholder system perspective and for the provision of according tools and methods to manage them (Böhmann et al. 2014). Therefore, we are providing a design framework as an initial step for the development of a nascent theory of design and action (Gregor 2006) in form of a multi-step design framework for the systematic design of modular service systems, comprising respective design guidelines and a course of action. As this framework builds on the four categories service system`s research focuses on, namely people, processes, technology, and organization, we are able to contribute by extending the existing body of knowledge in these areas. For the first time, systematic design knowledge for not only services, but service systems and its underlying engineering mechanisms are presented. While past and current literature focused on contributions for either systematic design of services or service innovations or taking a system`s perspective, we combine these two streams. From a general perspective, this is how we contribute to the design of service systems that is relevant for all settings where the experience of incumbents and the innovative and agile character of startups are key to success and need to be combined. This addresses a class of problems that is particularly relevant in the realm of digital transformation where dyadic provider-customer relationships are replaced by partnering approaches as in our ADR project. Through the ADR project, we outline a specific setting in the context of fintech and corporate venturing. Further, the design framework illustrates how new service systems can be formed around single existing or new services and how module-wide innovation can be achieved.

For practice, this paper provides guidance for incumbents throughout the systematic design approach of new service systems together with partner from the digital world. This might encourage incumbents and new market entrants to systematically develop innovative service systems and exploit white spots together. Therefore, this study provides a five step design framework, comprising a straightforward course of action and respective lessons learned for each step. This precise course of action helps to keep the focus on the design activities and to reduce delays and the waste of money and resources, which enables a more focused and thoughtful design.

**Limitations and Implications for Further Research**

The presented study comprises some limitations, which pave the way for future research. First, the proposed nascent theory of design and action has been derived by formalizing the learnings from our project. Even though, we made great effort, to ensure the comprehensibility of the design framework, it has been evaluated by qualitative interviews only. It has not been applied by incumbents to design new service systems. Therefore, its prescriptive application might reveal additional insights and lead to further revisions of the design framework. Following this argument, the design framework has been developed and evaluated in crowdsourcing contexts only and might be biased by cultural influences, as it has only been considered within the German-speaking area. Thus, experiences by applying it in other contexts and cultural regions might also lead to new insights, which should be considered for revising the design framework. Finally, the evaluation of the designed CSS has been undertaken shortly after its go live and does not provide longitudinal statements about the sustainability of the design.

We hope that this study and the proposed design framework encourages researchers to investigate the structure and constituting blocks of crowdfunding service systems in more detail. The proposed design framework might serve as an initial step for the development of a nascent design theory for crowdfunding service systems. This might support design approaches to be more structured and less ad hoc.

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# 11. SUMMARY OF THE DISSERTATION'S CONTRIBUTIONS

## THEORETICAL CONTRIBUTIONS

This dissertation was motivated by the need for conceptualizing and systemizing the novel phenomenon of crowdfunding. Since current research mostly focused on the generic outcomes of applying crowdfunding as a capital giver or capital seeker, this thesis strives to provide insights regarding the most pivotal, service providing aspects of the phenomenon. Thereby, this thesis brings clarity to the former black box of how crowdfunding works on a conceptual perspective, by bridging the component perspective with a functional perspective of crowdfunding intermediation, which provides the crowdfunding service provision within service systems. Therefore, this thesis provides not only theoretical and descriptive insights regarding the components and inner workings of crowdfunding service systems, but also generates actionable knowledge regarding the design and conceptualization of crowdfunding service systems.

In order to achieve these contributions, the thesis bridges and transforms traditional concepts, e.g., financial intermediation theory or the concept of service systems, to the new phenomenon of crowdfunding. Therefore, not only theory building contributions regarding crowdfunding can be obtained, but also an expansion of established theories and concepts can be achieved, by providing insights of their application in the context of a novel Internet driven phenomenon.

Along the three complementary research questions, this thesis provides specific theoretic contributions, which supports the theory building in crowdfunding, by moving the focus away from isolated perspectives on single components of crowdfunding, such as motivations of capital seekers and givers (Burtch et al. 2013b; Burtch et al. 2016; Ordanini et al. 2011) and factors influencing the successful funding of projects (Ahlers et al. 2015; Mollick 2014), etc. to the consideration of crowdfunding as a platform-based and digitally transformed form of financial intermediation, which combines multiple value-creating components in order to serve a specific purpose. Therefore, this thesis provides three major fields of contributions.

### Modularization of Crowdfunding Services

This thesis supports and extends current research on the functional conceptualization of crowdfunding (Beaulieu et al., 2015; Belleflamme et al., 2014; Liebenau et al. 2014; Tomczak & Brem, 2013) by considering crowdfunding as a modular service system.

The decomposition of those crowdfunding service systems led to the identification of the constituting service-performing modules of crowdfunding. Thereby, research question two *"how can crowdfunding service systems be decomposed?"* was answered.

The modular decomposition enables the bundling of traditional capabilities of a bank and the novel capabilities of external partners within a CSS, as suggested by Christensen and Raynor (2013). The modular perspective further reveals that crowdfunding is not an entirely new way of financial service provision but due to IT and the Internet traditional service modules of financial intermediation (e.g., payment, banking) can be combined with novel service modules (e.g., matchmaking) effectively in order to create innovative Crowdfunding offerings. Besides the identification of twelve constituting service modules, which are performed by four service providing roles the service modules are analyzed on a process level. Therefore, the exchange relationships and business operations between the modules and the involved roles are modelled and analyzed. This in-depth insights in the modular structure and the inner workings of crowdfunding enables the exploitation of traditional modularization benefits such as flexibility, reuse, variability, and module-wide innovation (Böhmann et al. 2008; Böhmann and Krcmar 2006; Peters et al. 2015a).

Additionally, this thesis' functional findings about the modular structure of crowdfunding helps to explain how this new way of funding was able to establish in the market of financial intermediation. This thesis shows, that however the competitive edge of crowdfunding lies on components, which have not been considered relevant for traditional financial intermediation so far, crowdfunding is not entirely new. In large parts it relies on the same set of activities than traditional financial intermediation. By identifying the constituting components and the respective inner workings of crowdfunding, it is shown, how the transformation functions of traditional financial intermediation are implemented and what turns out to be the actual new. Therefore, it is concluded that crowdfunding is less of a new way of financial intermediation. Crowdfunding rather reflects a crowd-enabled form of financial intermediation (Agrawal et al. 2010; Baeck and Collins 2013; Beaulieu et al. 2015; Mollick and Robb 2016). Thereby, the crowd is integrated in order to satisfy capital demands by establishing peer-to-peer connections between capital seekers and capital givers (Belleflamme 2014).

Further, considering the variety of crowdfunding service systems, a crowdfunding configuration framework is presented. This configuration framework builds on the modular structure of crowdfunding an helps to categorize crowdfunding service systems. This simplifies the comparison of crowdfunding service systems on both, a functional and a component level. This might provide interesting results for a better understanding of the crucial components to perform crowdfunding in various fields of application. This might also give guidance for the design of crowdfunding service systems. Therefore, this thesis extends previous research on formative and conceptual topics in crowdfunding (Beaulieu et al., 2015; Belleflamme et al., 2014; Liebenau et al. 2014; Tomczak & Brem, 2013).

**Crowdfunding Intermediation Theory and Archetypes**

As research on the crowdfunding intermediaries themselves and the associated financial intermediation has been largely neglected, this thesis provides a pioneering contribution on the conceptualization of the crowdfunding phenomenon, by proposing a crowdfunding intermediation theory and deriving respective archetypes. Therefore, the thesis bridges previous research on crowdfunding and financial intermediation by conceptualizing intermediation mechanisms as central constructs of financial intermediation. Thus, we are able to describe how crowdfunding intermediaries are able to perform the lot size, risk, and information transformation functions of traditional financial intermediaries, based on the implementation and bundling of a specific set of crowdfunding mechanisms. Thus, research question one *"how is crowdfunding performing financial intermediation?"* was answered. The theory's form of representation, its constructs, relationships and the theory's scope are presented in Table 26:

***Table 26: Profile: Crowdfunding Intermediation Theory***

| **Theory Overview** | |
|---|---|
| The system theory of crowdfunding intermediation describes how crowdfunding intermediaries perform financial intermediation. | |
| **Theory Components** | **Instantiation** |
| Form of representation | The theory is presented by the description of crowdfunding intermediation, which comprises capital givers and seekers as well as the crowdfunding intermediary. The theory provides an explanatory description of how crowdfunding intermediation is performed. |

| | |
|---|---|
| Constructs | The core constructs of crowdfunding intermediation theory are six mechanisms that perform the three functions of transforming lot sizes, risk, and information. These mechanisms are implemented in the crowdfunding intermediation system by certain instantiations, depending on the specific purpose and context of the system. |
| Relationships | Although the implementation of certain intermediation mechanisms is independent, there are robust patterns of co-occurrence and dominant configurations of them that result in three archetypes of crowdfunding intermediation – hedonism, philanthropic and profit-orientation. The alignment with one of the archetypes enhances the effectiveness of the configuration. |
| Scope | The theory is generalizable to the field of crowdfunding and can be used to unravel the buildings blocks of crowdfunding intermediation, classification of crowdfunding intermediaries, and differentiating crowdfunding from traditional financial intermediation |

Unravelling the functioning of crowdfunding intermediation by introducing a systemic perspective enables researchers to take a more fine-grained perspective on single mechanisms and their cause and effects (Mollick 2014; Mollick 2016; Younkin and Kuppuswamy 2017). Thus, the theory is generalizable to the field of crowdfunding and can be used to unravel the buildings blocks of crowdfunding intermediation, classification of crowdfunding intermediaries, and differentiating crowdfunding from traditional financial intermediation.

Further, the proposed crowdfunding intermediation theory does not only describe the single components of crowdfunding intermediation, but also unravels the interactions between these mechanisms and patterns within their configurations. This leads to the identification of timely stable archetypal systems that effectively balance demand and supply for capital (Burton-Jones et al. 2015) within a specific funding context. Thus, the empirical analysis identifies dominant configurations based on the co-occurrence of the intermediation mechanisms' specific instantiations. The three identified archetypes of profit-oriented, philanthropic, and hedonic crowdfunding intermediation describe the generic orientation and inner workings of how the crowdfunding intermediation between capital givers and capital seekers is performed and, thus, does account for the multifariousness and complexity of the crowdfunding phenomenon.

Thus, the theory of crowdfunding intermediation represents an empirical taxonomy that classifies crowdfunding intermediaries based on how they perform financial intermediation.

The crowdfunding intermediation theory extends and surpasses current classification approaches for crowdfunding (Bradford 2012; Belleflamme 2014; Hemer 2011), as it is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon. Our classification approach abstracts from single instantiations of specific mechanisms. It enables generalizable and timely robust classification, which serve as a more solid base for the location of future research on crowdfunding.

Additionally, the crowdfunding intermediation theory and respectively the identified archetypes also provide formative insights. The archetypes derived from crowdfunding intermediation theory do represent context-specific configurations, which ensure the effectiveness of the intermediation process. Thus, the alignment of a crowdfunding intermediary with its context-specific archetype enhances the effectiveness and thus, sustainability of the platform. This paves the way for more design-oriented questions within the field of crowdfunding, which has been largely neglected in research so far (Tomczak 2013; Beaulieu 2015). Thus, the theory of crowdfunding intermediation provides general guidance for researchers, investigating the systemic structure and the effective design of crowdfunding service systems and helps to inform future designs.

Besides the contribution of the crowdfunding intermediation theory to crowdfunding research, it also provides contributions for the expansion of established theories and concepts. More specific, this thesis extends financial intermediation theory (Allen and Santomero 1998; Diamond 1984) by addressing its shortcomings – coping with a high degree of digitization by applying innovative information technology, joint co-creation of value in ecosystems, a changed role of the intermediary, and the focus on niche markets – in the context of crowdfunding. By considering crowdfunding intermediation being performed within an IT-enabled system of interrelated mechanisms it can be shown how financial intermediation is affected by digitization and the Internet.

Further, the described theory also contributes to research on two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) by combining the theory's institutional perspective on market agents with the functional perspective of financial

intermediation theory using crowdfunding as an example. Thus, this research enables a more indulgent understanding on how intermediaries in two-sided markets manage exchange relationships between multiple classes of agents.

Crowdfunding intermediation theory helps us better explain industry dynamics in a digitized financial service industry and how digitization provides alternative approaches to providing established and necessary services for modern societies. In a similar vein, crowdfunding intermediation theory captures how financial intermediation is encapsulated in different IT-facilitated intermediation mechanisms within in a multi-sided platform business. Whereas existing financial intermediation theory is agnostic regarding the role of digital technologies for providing financial intermediation, crowdfunding intermediation theory exhibits precisely which constituent parts of financial intermediation are now facilitated by means of digital technologies and specifically how these changes look like. In greater detail, it is demonstrated how different configurations of these IT-enabled mechanisms shape the dominating modes of financial intermediation and thus create highly specialized offerings, which enable the creation of a long-tail of the financial service industry. Researching the fast developing crowdfunding industry may improve our understanding of how the Internet and the digitization affect and reconfigure existing industries. This is particularly important as more and more industries are affected by these phenomena.

**Designing of Crowdfunding Service Systems**

Further, the thesis aims to extend the purely descriptive focus of conceptualizing the phenomenon of crowdfunding. Therefore, this thesis' provides formative insights to inform and guide the design of crowdfunding service systems. Thereby, research question three *"how to systematically design crowdfunding service systems?"* was answered.

This thesis shows that even crowdfunding represents a certain disintermediation of the funding process, as no central institution is needed in order to provide the capital, due to prevalent transaction costs – e.g., by the collection of multiple micropayments and the micro repayments – and information asymmetries – e.g., due to the occurrence of information hiding, manipulation, and fraudulent behavior information (Ahlers et al. 2015; Burtch et al. 2016; Cumming et al. 2016; Siering et al. 2016) – intermediaries are still essential (Bakos 1991; Bakos 1998; Cumming and Zhang 2019; Lin 2015; Mahadevan 2000). However, as shown in this thesis, crowdfunding intermediation

exhibit three fundamental differences compared to traditional financial intermediaries. (1) Funding decisions and activities are no longer reserved to professional financial institutions (e.g., banks or venture capitalists), but democratized by opening up to every individual with Internet access and the required financial ability (Belleflamme et al. 2014). Anyhow the dynamics of capital giving on crowdfunding is consistent to traditional forms of funding with strategically acting capital givers looking for quality return with manageable risk (Berns et al. 2018). (2) They provide funding for projects that have limited access to traditional forms of funding due to high investment risk and/or low profitability expectations and that may reflect the long tail of the financial service industry (Liebenau et al. 2014; Schwienbacher and Larralde 2012). Crowdfunding intermediaries make extant use of information technology aiming at serving such projects profitable (e.g., co-creation based on web 2.0 approaches, big data analytics, or process automatization) (Haas et al. 2015). Thus, crowdfunding is based on platform principles, which bring network effects to the fore while other characteristics of traditional funding become less important (Belleflamme et al. 2015; Belleflamme et al. 2018). (3) As opposed to traditional financial intermediaries, crowdfunding intermediaries are not involved in the actual funding process. Crowdfunding intermediaries serve as matchmaker by linking capital seekers and givers directly and by enabling them to exchange capital and value for which they provide the technical or organizational infrastructure on an online platform and ensure quality of the proposed projects (Cumming and Zhang 2019; Fehrer and Nenonen 2019; Liebenau et al. 2014).

By providing an illustrative case for the design of a crowdlending system as a sub-field of crowdfunding and providing systemic insights on the constituting components and inner workings of a crowdlending system, the thesis supports future design considerations to a more systematic and less ad hoc conceptualization process. By conceptualizing the complex exchange relationships between capital givers, capital seekers and the crowdlending system and service performing roles, into a handy modular concept, the thesis provides a better overview over the necessary design and partner decisions. Therefore, again, the thesis contributes to the research on service science, which calls for *"research, leading to actionable knowledge for systematically designing, developing, and piloting service systems"*, for a multi-stakeholder system perspective and for the provision of according tools and methods to manage them (Böhmann et al., 2014).

The thesis is building on existing design knowledge and approaches regarding service research (Alam, 2002; Kim & Meiren, 2010; Meiren, 1999; Scheuing & Johnson, 1989) and extends this research by highlighting the importance of the modularization of the service system as prerequisite of integrating partners into the service system. Thereby, the particularities of designing service systems are addressed – rather than sole services which has been studied for decades under the umbrella of "service engineering" or "new service development". While past and current literature focused on contributions for either systematic design of services or service innovations (Ding et al., 2010; Morelli, 2002; Ostrom et al., 2015; Wagner, Benlian, & Hess, 2013) or taking a systemic perspective (Böhmann et al., 2014; Edvardsson et al., 2012; S. L. Vargo et al., 2008), this thesis combines these streams.

Following this argument, the thesis' findings might serve as a starting point for the development of a nascent design theory (Gregor, 2006; Gregor & Jones, 2007) for the systematic design of service systems as it provides explicit design knowledge (Gregor, 2006; Gregor & Jones, 2007; Walls, Widmeyer, & El Sawy, 1992). This might be especially relevant in the current context of digital transformation and applies to all settings where a) dyadic provider-customer relationships are replaced by partnering and multi-stakeholder approaches, b) roles in a service system are highly heterogeneous and therefore, hard to be aligned, e.g., long-established company group vs. recently-founded SME, hierarchical vs. agile working structures, or as in the investigated project: start-up vs. incumbent, fintech vs. traditional bank.

### PRACTICAL CONTRIBUTIONS

The conceptualization of the phenomenon of crowdfunding, which was elaborated throughout this thesis, also contains valuable practical contributions for both, incumbents of the financial service industry and established, new, and potential crowdfunding intermediaries.

Traditional financial intermediaries, like e.g. banks, get deeper insights into how the Internet affects their industry and how their core functionalities are performed by applying innovative information technology. Characterizing potential competitors based on the empirical taxonomy, derived from crowdfunding intermediation theory, helps incumbents to gain a better understanding of the disruptive potential of crowdfunding and to gain a better overview of this new competitive arena. Further, the thesis provides guidance for incumbents throughout the systematic design approach of new service systems together with partner from the digital world. With this regard it

enables the decision support for the assessment of required competences and might encourage incumbents and new market entrants to systematically develop innovative service systems and exploit white spots together. Therefore, the thesis provides prescriptive design knowledge, comprising a straightforward course of action and respective lessons learned for each design step. This precise course of action helps to keep the focus on the design activities and to reduce delays and the waste of money and resources, which enables a more focused and thoughtful design.

For established crowdfunding intermediaries and emerging new players in the crowdfunding domain, the identified mechanisms, the constituting modules of crowdfunding and the respective dominant design patterns basically represent archetypal design choices for implementing effective crowdfunding intermediation and thus, viable crowdfunding service systems. Therefore, the thesis' findings about the conceptualization of crowdfunding might support established providers of crowdfunding service systems to evaluate their current system configurations and the explicit design knowledge may serve as starting point for the design of innovative crowdfunding service systems. This might encourage current crowdfunding intermediaries to expand their activities and new start-ups to enter the market in order to open up unexploited niche markets, help to establish the phenomenon and to develop it further. In this regard, it may help to identify white spots in the own financial intermediation model such that the thesis' results should help facilitate the process of designing and creating more sophistic models of financial intermediation.

# 12. LIMITATIONS & IMPLICATIONS FOR FURTHER RESEARCH

This thesis presents valuable contributions for both, theory and practice. Anyhow some limitations of the research carried out within this thesis must be taken into account.

First, the sampling procedure throughout the presented papers was limited to English or German speaking crowdfunding intermediaries. A broader cultural scope might produce slightly different results e.g. of archetypes of crowdfunding intermediation. Following this argument, cultural comparison in the context of crowdfunding archetypes might be promising avenue for future research, as the relationship to money and financial products is highly culture-sensitive. However, the underlying sample shows a broad geographic dispersion, also including a variety of non-English/German speaking countries and a second round of data collection for validating the categorization approaches indicates robustness of the results. Further, as the USA, UK, and Germany are among the biggest and most mature crowdfunding markets worldwide, the generalizability of the results can be assumed.

A second limitation relates to the qualitative coding approaches. While it was put high effort in ensuring reliability and validity of the applied data, using objective platform data might have produced an even more sophisticated assessment of crowdfunding intermediaries. However, many of the characteristics investigated in the studies have a dichotomous nature such that it was a deliberate decision to collect all data as dummy variables in order to reduce the complexity of data collection. However, the exact implementation of an instantiation of a mechanism and their combination is highly divers with regard to their performance. Future research might elaborate on the identification of successful implementation and configuration patterns.

Third, the crowdfunding industry is highly dynamic with most crowdfunding intermediaries being start-ups. As a consequence, models of financial intermediation are constantly evolving in the crowdfunding industry potentially leading to novel types of crowdfunding intermediation. However, especially due to the two independent rounds of data collection, it can be assumed that the identified mechanisms, modules, instantiations, and archetypes of crowdfunding intermediation and crowdfunding service systems can be seen as stable and timely robust. However, future research might investigate the temporal evolution of crowdfunding intermediation mechanisms, their instantiations, and combinations.

Fourth, the proposed first step for a nascent theory of design and action has been derived by formalizing the learnings from one project. Even though, great effort has been made to ensure the comprehensibility of the theory, it has been evaluated by qualitative interviews only. It has not been applied by additional incumbents to design new service systems. Therefore, its prescriptive application might reveal additional insights and lead to further revisions of the proposed nascent theory. Following this argument, the proposed nascent design theory has been developed and evaluated in crowdsourcing contexts only. Thus, experiences by applying it in other contexts might also lead to new insights, which should be considered for revising and developing the theory further. Finally, the evaluation of the designed crowdfunding service system has been undertaken shortly after its go live and does not provide longitudinal statements about the sustainability of the design.

Finally, beyond the already outlined research gaps, this thesis might encourage other researchers to further unravel the inner workings of crowdfunding intermediaries. Therefore, the system theoretical perspective outlined in this thesis can be expanded by taking variance or process theoretical perspectives (Burton-Jones et al. 2015). This might help to increase the understanding of causalities and dependencies among the constituting components of crowdfunding intermediation systems and paves the way for generic design theories for crowdfunding intermediation systems. In particular in the course of the progressive maturation and establishment of the phenomenon crowdfunding, this thesis offers helpful bases for future research for the extension and deepening of the conceptualization of the research area crowdfunding. This might support future design approaches to be more structured and less ad hoc and helps for a better in-detail understanding and categorization of the various fields of application and the respective inner workings.

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***2012***

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# CURRICULUM VITAE

## Personal Data

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## Practical Experience

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| 11/2017 – today | Strategic Assistant to the Group CIO |
| | Helsana Versicherungen AG, Zurich, Switzerland |
| 09/2013 – 07/2017 | Research Associate and Project Manager |
| | Institute of Information Management, University of St.Gallen, Switzerland |
| 11/2011 – 03/2013 | Working Student: Innovation Management |
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## Education

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| 09/2013 – 09/2020 | Ph.D. in Management: Business Innovation |
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