

Please quote as: Haas, P.; Blohm, I.; Peters, C. & Leimeister, J. M. (2015):  
Modularization of Crowdfunding Services – Designing Disruptive Innovations in the  
Banking Industry. In: International Conference on Information Systems (ICIS), Fort  
Worth.

# Modularization of Crowdfunding Services – Designing Disruptive Innovations in the Banking Industry

*Research-in-Progress*

**Philipp Haas**<sup>1</sup>  
philipp.haas@unisg.ch

**Ivo Blohm**<sup>1</sup>  
ivo.blohm@unisg.ch

**Christoph Peters**<sup>1</sup>  
christoph.peters@unisg.ch

**Jan Marco Leimeister**<sup>1,2</sup>  
janmarco.leimeister@unisg.ch

<sup>1</sup>University of St. Gallen  
Institute of Information Management  
Unterer Graben 21, CH-9000 St. Gallen, Switzerland

<sup>2</sup>Kassel University  
Information Systems  
Pfannkuchstr. 1, D-34121 Kassel, Germany

## 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, through 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 (Böhmman 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 (Böhmman 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. 2015). 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 (Böhmman 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. 2013), their motivation (Bretschneider et al. 2014; Gerber et al. 2012) and success factors of crowdfunding projects (Mitra and Gilbert 2014; 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 bank's 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 1 summarizes the preliminary IT-enabled services.

<b>Table 1, Overview of Services</b>	
<b>Services</b>	<b>Description</b>
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 1: 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 1. 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 1](#)).

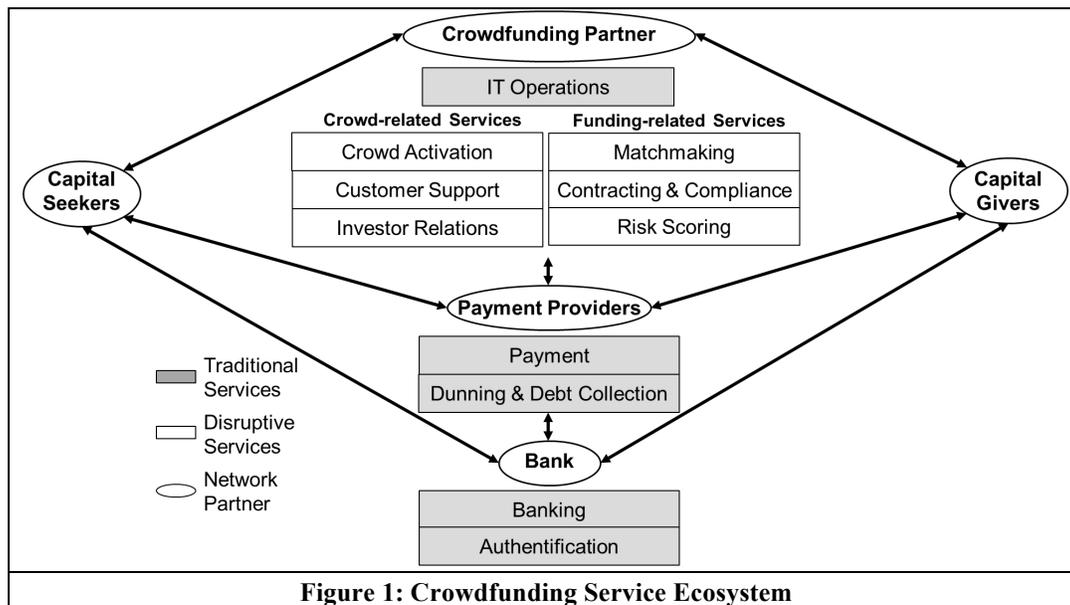


Figure 1: Crowdfunding Service Ecosystem

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 2 summarizes the two additional planned cycles. Cycle 2 focuses on decomposing the services into constituting modules, which will be used to implement the crowdfunding service bundle in cycle 3.

<b>Table 2, Planned Phases of the 2<sup>nd</sup> and 3<sup>rd</sup> Action Research Cycle</b>
<p><b>Cycle 2 – Modularization</b></p> <p><i>Phase 1 – Diagnosing:</i></p> <p>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.</p> <p><i>Phases 2 &amp; 3 – Action Planning / Action Taking:</i></p> <p>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.</p> <p><i>Phase 4 – Evaluation:</i></p> <p>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.</p> <p><i>Phase 5 – Specifying Learning:</i></p> <p>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.</p>
<p><b>Cycle 3 – Implementation</b></p> <p><i>Phase 1 – Diagnosing:</i></p> <p>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.</p> <p><i>Phases 2 &amp; 3 – Action Planning / Action Taking:</i></p> <p>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).</p>

Julia  
Forn  
Julia  
Gelö:  
Julia  
Gelö:  
Julia  
Forn

**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 2. 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 (Böhm et al. 2014).

## Acknowledgements

This article was partly funded by the Basic Research Fund of the University of St. Gallen (Switzerland). Further, we thank all project partners for their support in data collection and for their valuable comments.

## References

- Agrawal, A., Catalini, C., and Goldfarb, A. 2010. "The Geography of Crowdfunding " in: NET Institute Working Paper No. 10-08.
- Aguinis, H. 1993. "Action Research and Scientific Method: Presumed Discrepancies and Actual Similarities," *The Journal of Applied Behavioral Science* (29:4), pp. 416-431.
- Allen, F., and Santomero, A. M. 1998. "The Theory of Financial Intermediation," *Journal of Banking & Finance* (21:11-12), pp. 1461-1485.
- Baida, Z., Gordijn, J., and Omelayenko, B. 2004. "A Shared Service Terminology for Online Service Provisioning," *Proceedings of the 6th international conference on Electronic commerce: ACM*, pp. 1-10.
- Balzert, H. 1996. *Lehrbuch Der Software-Technik*. Heidelberg, Berlin, Oxford: Spektrum, Akademischer Verlag.
- Bask, A., Lipponen, M., Rajahonka, M., and Tinnilä, M. 2010. "The Concept of Modularity: Diffusion from Manufacturing to Service Production," *Journal of Manufacturing Technology Management* (21:3), pp. 355-375.
- Baskerville, R., and Myers, M. D. 2004. "Special Issue on Action Research in Informaton Systems: Making Is Research Relevant to Practice Foreword," *Management Information Systems Quarterly* (28:3), p. 2.
- Baskerville, R. L., and Wood-Harper, A. T. 1996. "A Critical Perspective on Action Research as a Method for Information Systems Research," *Journal of Information Technology* (11:3), pp. 235-246.
- Beck, R. 2010. "Can It Lean against the Wind? Lessons from the Global Financial Crisis," *Communications of the ACM*, pp. 38-40.
- Belleflamme, P., Lambert, T., and Schwienbacher, A. 2013. "Crowdfunding: Tapping the Right Crowd," *Journal of Business Venturing*.
- Böhmman, T., and Kremer, H. 2006. "Modulare Servicearchitekturen," in *Service Engineering*, H.-J. Bullinger and A.-W. Scheer (eds.). Berlin, Heidelberg, Germany: Springer, pp. 377-401.
- Böhmman, T., Langer, P., and Schermann, M. 2008. "Systematische Überführung Von Kundenspezifischen It-Lösungen in Integrierte Produkt-Dienstleistungsbausteine mit der Score-Methode," *Wirtschaftsinformatik* (50:3), pp. 196-207.
- Böhmman, T., Leimeister, J., and Möslin, K. 2014. "Service Systems Engineering," *Business & Information Systems Engineering* (56:2), pp. 83-90.
- Bradford, C. S. 2012. "Crowdfunding and the Federal Securities Laws," *Columbia Business Law Review* (2012:1).
- Bretschneider, U., Knaub, K., and Wieck, E. 2014. "Motivations for Crowdfunding: What Drives the Crowd to Invest in Start-Ups?," 22nd European Conference on Information Systems (ECIS 2014), Tel Aviv, Israel (accepted for publication).
- Burtch, G. 2011. "Herding Behavior as a Network Externality," in: ICIS 2011. Shanghai.
- Burtch, G., Ghose, A., and Wattal, S. 2013. "An Empirical Examination of Users' Information Hiding in a Crowdfunding Context," 34th. International Conference on Information Systems (ICIS 2013), Milan, Italy.
- Chesbrough, H., and Spohrer, J. 2006. "A Research Manifesto for Services Science," *Communications of the ACM* (49:7), pp. 35-40.
- Christensen, C. 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business Review Press.
- Christensen, C., and Raynor, M. 2013. *The Innovator's Solution: Creating and Sustaining Successful Growth*. Harvard Business Review Press.
- Christensen, C. M., and Overdorf, M. 2000. "Meeting the Challenge of Disruptive Change," *Harvard business review* (78:2), pp. 66-77.
- Davison, R. 2001. "Gss and Action Research in the Hong Kong Police," *Information Technology & People* (14:1), pp. 60-77.

- de Blok, C., Luijkx, K., Meijboom, B., and Schols, J. 2010. "Modular Care and Service Packages for Independently Living Elderly," *International Journal of Operations & Production Management* (30:1), pp. 75-97.
- Diamond, D. W. 1984. "Financial Intermediation and Delegated Monitoring," *The Review of Economic Studies* (51:3), pp. 393-414.
- Diamond, D. W., and Rajan, R. G. 1999. "Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking," *National Bureau of Economic Research Working Paper Series* (No. 7430).
- Edvardsson, B., Skålén, P., and Tronvoll, B. 2012. "Service Systems as a Foundation for Resource Integration and Value Co-Creation," *Review of Marketing Research* (9:2), pp. 79-126.
- Evans, D. S., and Jovanovic, B. 1989. "An Estimated Model of Entrepreneurial Choice under Liquidity Constraints," *Journal of Political Economy* (97:4), pp. 808-827.
- Fincher, S., and Tenenber, J. 2005. "Making Sense of Card Sorting Data," *Expert Systems* (22:3), pp. 89-93.
- Gartner. 2010. "Gartner Says 50 Per Cent of Banks Will Still Lack an Innovation Programme and Budget by 2013." Retrieved 28.09.2014, from <http://www.gartner.com/newsroom/id/1272313>
- Gerber, E. M., Hui, J. S., and Kuo, P.-Y. 2012. "Crowdfunding: Why People Are Motivated to Post and Fund Projects on Crowdfunding Platforms," *ACM Conference on Computer Supported Cooperative Work (Workshop Paper)*.
- Haas, P., Blohm, I., and Leimeister, J. M. 2014. "An Empirical Taxonomy of Crowdfunding Intermediaries," *International Conference on Information Systems (ICIS)*, Auckland, New Zealand.
- Holtz-Eakin, D., Joulfaian, D., and Rosen, H. S. 1993. "Entrepreneurial Decisions and Liquidity Constraints," *National Bureau of Economic Research*.
- Johansson, E. 2000. "Self-Employment and Liquidity Constraints: Evidence from Finland," *The Scandinavian journal of economics* (102:1), pp. 123-134.
- Kelly, G. A. 1955. *The Psychology of Personal Constructs*. New York: Norton.
- Kohler, T., Fueller, J., Matzler, K., and Stieger, D. 2011. "Co-Creation in Virtual Worlds: The Design of the User Experience," *MIS Quarterly* (35:3), pp. 773-788.
- Langlois, R. N., and Robertson, P. L. 1992. "Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries," *Research Policy* (21:4), pp. 297-313.
- Leland, H. E., and Pyle, D. H. 1977. "Informational Asymmetries, Financial Structure, and Financial Intermediation," *Journal of Finance* (32:2), pp. 371-387.
- Liebenau, J., Elaluf-Calderwood, S., and Bonina, C. 2014. "Modularity and Network Integration: Emergent Business Models in Banking," *System Sciences (HICSS)*, 2014 47th Hawaii International Conference on: IEEE, pp. 1183-1192.
- Maglio, P. P., Srinivasan, S., Kreulen, J. T., and Spohrer, J. 2006. "Service Systems, Service Scientists, Sme, and Innovation," *Communications of the ACM* (49:7), pp. 81-85.
- Massolution. 2013. "The Crowdfunding Industry Report."
- Mitra, T., and Gilbert, E. 2014. *The Language That Gets People to Give: Phrases That Predict Success on Kickstarter*. CSCW.
- Mollick, E. 2014. "The Dynamics of Crowdfunding: An Exploratory Study," *Journal of Business Venturing* (29:1), pp. 1-16.
- O'Reilly, T. 2007. "What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software," *Communications & Strategies*(1), pp. 17-37.
- O'Sullivan, J., Edmond, D., and Ter Hofstede, A. 2002. "What's in a Service?," *Distributed and Parallel Databases* (12:2-3), pp. 117-133.
- Peters, C. 2014. "Together They Are Strong - the Quest for Service Modularization Parameters," *European Conference on Information Systems (ECIS)*, Tel Aviv, Israel.
- Peters, C., Kromat, T., and Leimeister, J. M. 2015. "Complex Services and According Business Models – Design and Evaluation of an Analysis Framework in the Field of Telemedicine," in: *48th Hawaii International Conference on System Sciences (HICSS)* Koloa, Hawaii, USA.
- Peters, C., and Leimeister, J. M. 2013. "Tm3-a Modularization Method for Telemedical Services: Design and Evaluation," *Proceedings of 21st European Conference on Information Systems (ECIS)*.
- Schulz, M., Haas, P., Blohm, I., and Leimeister, J. M. 2015. "How Idea Creativity and Hedonic Value Influence Project Success in Crowdfunding," in: *12th International Conference on Wirtschaftsinformatik (WI2015)*. Osnabrück, Germany.

- Spohrer, J., Vargo, S. L., Caswell, N., and Maglio, P. P. 2008. "The Service System Is the Basic Abstraction of Service Science," *Proceedings of the 41st Hawaii International Conference on System Sciences (HICSS): IEEE*, pp. 104-104.
- Street, C. T., and Meister, D. B. 2004. "Small Business Growth and Internal Transparency: The Role of Information Systems," *MIS Quarterly*, pp. 473-506.
- Susman, G. I., and Evered, R. D. 1978. "An Assessment of the Scientific Merits of Action Research," *Administrative Science Quarterly* (23:4), pp. 582-603.
- Teece, D. J. 1986. "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy* (15:6), pp. 285-305.
- Tomczak, A., and Brem, A. 2013. "A Conceptualized Investment Model of Crowdfunding," *Venture Capital* (15:4), pp. 335-359.
- Tuunanen, T., and Cassab, H. 2011. "Service Process Modularization," *Journal of Service Research* (14:3), pp. 340-354.
- Upchurch, L., Rugg, G., and Kitchenham, B. 2001. "Using Card Sorts to Elicit Web Page Quality Attributes," *Ieee software* (18:4), pp. 84-89.
- Voss, C. A., and Hsuan, J. 2009. "Service Architecture and Modularity\*," *Decision Sciences* (40:3), pp. 541-569.
- Welfens, P. J. J. 2010. "Finanzinnovationen, Wachstum Und Transatlantische Bankenkrise," in *Innovation Und Internationalisierung*, W. Baumann, U. Braukmann and W. Matthes (eds.). Gabler, pp. 303-326.
- Wieck, E., Bretschneider, U., and Leimeister, J. M. 2013. "Funding from the Crowd: An Internet-Based Crowdfunding Platform to Support Business Set-Ups from Universities," *International Journal of Cooperative Information Systems (IJCIS)* (3:22), pp. 1-12.