

Chris Richter

DIGITAL COLLABORATIONS AND ENTREPRENEURSHIP – THE ROLE OF SHAREECONOMY AND CROWDSOURCING IN THE ERA OF SMART CITY

Thesis for the degree of Doctor of Science (Economics and Business Administration) to be presented with due permission for public examination and criticism in the Auditorium of the Student Union House at Lappeenranta University of Technology, Lappeenranta, Finland on the 9th of June in 2016 at noon.

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Abstract

Chris Richter

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The thesis begins with the classical cooperation and transfers it to the digital world. This work gives a detailed overview of the young fields of research smart city, shareconomy and crowdsourcing and links these fields with entrepreneurship. The core research aim is the finding of connections between the research fields smart city, shareconomy and crowdsourcing and entrepreneurial activities and the specific fields of application, success factors and conditions for entrepreneurs.

The thesis consists of seven peer-reviewed publications. Based on primary and secondary data, the existence of entrepreneurial opportunities in the fields of smart city, shareconomy and crowdsourcing could be confirmed. The first part (publications 1-3) of the thesis are literature reviews to secure the fundamental base for further research. This part consists of newly created definitions and an extreme sharpening of the research fields for the near future. In the second part of the thesis (publications 4-7), empirical field work (in-depth interviews with entrepreneurs) and quantitative analyses (fuzzy set/qualitative comparative analysis and binary logistic regression analysis) contribute to the field of research with additional new insights.

Summarizing, the insights are multi-layered: theoretical (e.g. new definitions, sharpening of the research field), methodical (e.g. first time application of the fuzzy set/qualitative comparative analysis in the field of crowdfunding) and qualitative (first time application of in-depth interviews with entrepreneurs in the fields of smart city and shareconomy). The global research question could be answered: the link between entrepreneurship and smart city, shareconomy and crowdfunding could be confirmed, concrete fields of application could be identified and further developments could be touched upon. This work strongly contributes to the young fields of research through much-needed basic work, new qualitative approaches, innovative methods and new insights and offers opportunities for discussion, criticism and support for further research.

Keywords: smart city, shareconomy, crowdsourcing, crowdcreation, entrepreneurial opportunities, entrepreneurship

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After writing the last lines in this thesis, it is an honor and a great joy to express my gratitude to all those who supported me; gave me great advice; shared knowledge and memories; motivated me in weak moments and were around to celebrate the individual steps on the PhD marathon.

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May 15, 2016, Duesseldorf (near Cologne), Germany

Chris Richter

Don't give up!
Don't ever give up!

This work is dedicated to my family!

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Abstract

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List of publications

This thesis is based on seven papers. The following section presents the article and the author's distribution. The rights have been granted by publishers to include the papers in the thesis.

This thesis consists of seven journal articles, all peer-reviewed. Referring to the Finnish scale for evaluating the quality of the publications (Julkaisufoorumi), five of the seven publications made level "1" and one publication made level "2" on a three level hierarchy. "1" means basic, "2" means leading and "extensively appreciated and followed by the expert audience in the discipline of research area" (Julkaisufoorumi, 2015). One publication is published in an unranked journal. This article (article 6) will be published in the very recently created journal of "Journal of Innovation & Knowledge", which belongs to Elsevier Journals. This journal group has a strong reputation due to their A journals.

Transferring this evaluation to the German review system (VHB Online), a slightly changed result occurs due to the origin of the author. In a five-level ranking (from the top "A" to "E"), three article are published (or are in the review process) in journals classified "B", three are published in journals classified "C", and one is unranked. "B" are defined as important and respected scientific journals, "C" are defined as respected scientific journals by the German association of university teachers (VHB-JOURQUAL3, 2015).

Most of the publications were written in cooperation with co-authors. However, the author of the thesis was the first author in four cases (out of seven) and could even publish one article as a single author at "B" level. His own contribution to the publications are listed below.

PUBLICATION 1

Richter, C., Kraus, S., and Syrjä, P. (2015) The Smart City as an Opportunity for Entrepreneurs. *International Journal of Entrepreneurial Venturing*, accepted, Volume 7, Issue 3, pp. 211-226.

The author was responsible for the idea finding, the research plan, building the hypotheses, the literature review and writing most of the manuscript. The author was also responsible for the communication with the editor after two rounds of review and is also the corresponding author.

PUBLICATION 2

Richter, C., Kraus, S., and Syrjä, P. (2015) The Shareconomy as a Precursor for Digital Entrepreneurship Business Models. *International Journal of Entrepreneurship and Small Business*, Volume 25, Issue 1, pp. 18-35.

The author was responsible for the idea finding, the research plan, building the hypotheses, the literature review and writing most of the manuscript. The author was also responsible for the communication with the editor after two rounds of review and is also the corresponding author.

PUBLICATION 3

Richter, C. (2015) Crowdcreation as a Dimension of Crowdsourcing: Conditions for Entrepreneurs, *International Journal of Entrepreneurial Venturing*, accepted, Volume 7, Issue 4, pp. 324-340.

The author was responsible for everything as it is a single author publication in a B-level journal.

PUBLICATION 4

Kraus, S., Richter, C., Papagiannidis, S., and Durst, S. (2015) Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany, *Creativity and Innovation Management*, accepted, Volume 24, Issue 4, pp. 601–616.

The author was responsible for the idea finding, the research plan, building the hypotheses, the literature review, and writing most of the manuscript. The author undertook the in-depth interviews and supported the analysis and combined the contents. The author was mainly responsible for two reviews.

PUBLICATION 5

Richter, C., Brem, A., Kraus, S., Durst, S., and Gieselbrecht, C. (forthcoming) Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries, *Creativity and Innovation Management*, under review.

The author was responsible for the idea finding, the research plan, building the hypotheses, the literature review, and writing most of the manuscript. The author supported the in-depth interviews and the analysis and combined the contents.

PUBLICATION 6

Kraus, S., Richter, C., Brem, A., Chang, M.-L., and Cheng, C.-F. (2016) Strategies for reward-based crowdfunding campaigns, *Journal of Innovation & Knowledge*, accepted, Volume 1, Issue 1, pp. 13-23.

The author was responsible for the idea finding, the research plan, building the hypotheses, the literature review, expanding the data set manually and generating additional information, and contributed to the methods, research results, conclusion and managerial implications.

PUBLICATION 7

Kraus, S., Ferreira, J., Richter, C., Breitenecker, R., and Brem, A. (forthcoming) Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs, *International Entrepreneurship and Management Journal*, under review.

The author was responsible for the idea finding, the research plan, building the hypotheses, expanding the data set manually and generating additional information, supporting the data analyses, and writing most of the manuscript including the methods, research results, conclusion and managerial implications.

Table 1: Overview of the seven publications

#	Title	Journal	Finish rate	German rate	Status
1	The Smart City as an Opportunity for Entrepreneurs	International Journal of Entrepreneurial Venturing	1	B	accepted, published
	By: Richter, C., Kraus, S., and Syrjä, P. (2015)				
2	The Shareconomy as a Precursor for Digital Entrepreneurship Business Models	International Journal of Entrepreneurship and Small Business	1	C	accepted, published
	By: Richter, C., Kraus, S., and Syrjä, P. (2015)				
3	Crowdcreation as a Dimension of Crowdsourcing: Conditions for Entrepreneurs	International Journal of Entrepreneurial Venturing	1	B	accepted, published
	By: Richter, C. (2015)				
4	Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany	Creativity and Innovation Management	1	C	accepted, published
	By: Kraus, S., Richter, C., Papagiannidis, S., and Durst, S. (2015)				

5	Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries	Creativity and Innovation Management	1	C	under review
	By: Richter, C., Brem, A., Kraus, S., Durst, S., and Gieselbrecht, C. (forthcoming)				
6	Strategies for reward-based crowdfunding campaigns	Journal of Innovation & Knowledge	-*	-*	accepted, published
	By: Kraus, S., Richter, C., Brem, A., Chang, M.-L., and Cheng, C.-F. (2016)				
7	Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs	International Entrepreneurship and Management Journal	2	B/C	under review
	By: Kraus, S., Ferreira, J., Richter, C., Breiteneker, R., and Brem, A. (forthcoming)				

The Finish score varies from 0 to 3; “3” is the highest value. The German score varies from A to E, with “A” as the highest value.

*Publication 6 (Strategies for reward-based crowdfunding campaigns) will be published in the newly created “Journal of Innovation & Knowledge” and is therefore still unranked.

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List of abbreviations

DACH – D for Germany, A for Austria and CH for Switzerland

FsQCA – fuzzy set Qualitative Comparative Analysis

ICF – Intelligent community forum

ICT – Information and communication technology

IT – Information technology

Q&A – Questions and answers

QCA – Qualitative comparative analysis

SME – Small and medium enterprises

US – United States

1 Introduction

*“Digitization is creating a second economy that's vast, automatic, and invisible—
thereby bringing the biggest change since the Industrial Revolution”*

W. Brian Arthur (Arthur, 2011)

Regarding the quote, radical changes such as the invention of the steam engine or the assembly line in the context of the industrial revolution stand for increased speed, changing processes, changed business models, or saving resources (Carlsson, 2004; Senge et al., 2001). It goes hand in hand with the death of long-established businesses and the emergence of new, wild, radical companies (Zimmermann, 2000). The digital revolution, also called industry 3.0 (after the steam engine and the assembly line), is the harbinger of the now imminent 4th stage of development (Schlaepfer et al., 2015), the future project of high-technologies which communicate with each other, partly called Internet of the things (Atzori et al., 2010).

One of the key aspects of the entrepreneurial teaching by Schumpeter (1942) is the radical, the creative destruction (Senge et al., 2001). The readiness for change, for occupying niches and the new composition of existing production factors and the addition of new aspects leads to the Schumpeter approach, which is still highly accepted and the base for numerous explanations of entrepreneurship (Sledzik, 2013).

Currently, digitization determines the changes and improvements in several aspects of daily life, business as well as private sectors and even the interaction and communication between human beings (Arthur, 2011). The terms “always on” (Arthur, 2011), “24/7” (Malecki, 2003) or “mobile first” (Thomas, 2013) underline the relevance of the digital context, a high level of accessibility and high information content. Therefore, digitization in the context of entrepreneurship and entrepreneurial opportunities has increasingly raised interests from science and the economy in recent years (Hossain and Wigand, 2004). One of the terms, which often occurs in a variety of forms, is digital collaboration (Madlberger and Roztocki, 2009).

The definition of the term is very broad (Madlberger and Roztocki, 2009). Each Wikipedia entry or every Google result evaluation could be described as such a collaboration (He, 2012). Due to the fact that communication and working together are in everyday use and central aspects of our lives, the relevance of the topic is very high. The “user group” is unlimited. Therefore, a scientific consideration of this topic generates great attention. Several concepts of digital collaborations are currently being discussed: above all the intelligent city, which links various entities to increase the exchange, the comfort and the quality of life for the residents (Schaffers et al., 2011; Shapiro, 2008). This concept is called smart city. A second approach has emerged in particular in large cities, due to the lack of resources (e.g. “war of spaces”), and is the altered form of consumerism (Ozanne and Ballantine, 2010). Instead of buying everything and owning the goods, the trend of sharing objects has developed (Balck and Craacu, 2015). These objects can be of a digital (e.g. music), haptic (e.g. apartments) or

intellectual (e.g. knowledge transfer like Wikipedia) nature (Belk, 2010). This concept is called shareconomy. A third conception of digital collaboration is the detachment of tasks from classical companies to the anonymous mass (Zhao and Zhu, 2012). These tasks can vary from translations, reviews, tests, or financing ideas and projects (Tripathi et al., 2014). These options are processed via online platforms and in the necessary structure (Vukovic, 2009). The wisdom of the crowd is used to improve products and services or to find alternative options to realize financing (Brabham, 2008). These different approaches in the context of using the anonymous crowd via the Internet are subsumed under the term crowdsourcing.

Going back to the innovation theory by Schumpeter (1942), mostly small and medium-sized enterprises (SMEs) stand for flexibility, aggressiveness in conquering new markets, innovation consciousness and also the courage of trying something crazy and unexpected (Edwards et al., 2005; Rothwell and Dodgson, 1991). Established enterprises mostly cannot evoke the change to act in an unorthodox way due to the stakeholder expectations and the formal internal processes (Chang et al., 2011). Therefore, considering the SMEs in the DACH region (Germany, Austria and Switzerland), which have been focused on in this thesis, a strong impact can be determined.

In Germany, the number of SMEs, comprising micro, small and medium-sized businesses, has grown substantially since 2009 and amounts to approximately 2.2 million in 2013. In contrast, the number of large enterprises in the country is much smaller, i.e. approximately 11,000, corresponding to an SME market share of 99.5% (European Commission, 2014b). In Austria, this share even amounts to 99.7%, with approximately 300,000 SMEs and only 1,000 large enterprises in the year 2013 (European Commission, 2014a). Similar figures from the Swiss market reinforce the dominance and relevance of SMEs – in 2008, around 310,000 SMEs were counted, corresponding to a 99.6% share (WBF - Eidgenössisches Departement für Wirtschaft Bildung und Forschung, 2013).

This quantitative relevance of the topic combined with the thematic relevance justified the need for research in this field. Connecting the components digital collaboration and entrepreneurship, the assumption of the existence of various business opportunities and entrepreneurial fields of application seems justifiable. To the best knowledge of the author, existing literature uses more individual aspects of the collaboration concepts. The basic work and well-accepted definitions in the fields of smart city and shareconomy are not given (Allwinkle and Cruickshank, 2011; Katz et al., 2014) and therefore done in this thesis. Furthermore, no empirical evaluations in the areas of smart city and shareconomy are known. The analyses of German crowdfunding activities are rare and form a contrast to the dominant US-based evaluations (e.g. Kuppuswamy and Bayus, 2014; Mollick, 2014) Due to these facts, the author of this thesis addresses these topics. More concretely, this thesis explores gaps in the existing scientific literature:

First, are there entrepreneurial business opportunities in the concepts of smart city, shareconomy and crowdsourcing?

Second, what specific fields of application are given in the concepts of smart city and shareconomy and do the entrepreneurs' real experiences agree with the existing literature?

Third, what specific recommendations of action for entrepreneurs can be identified in crowdfunding (as a sub-category of crowdsourcing) concepts to increase the probability of success?

Considering the results of the thesis, the work provides contributions to the field of digital collaboration. Literature reviews in the first part of the thesis have created the fundamental basis. The combination of entrepreneurship and digital collaboration is illuminated comprehensively; self-created definitions subsume the best knowledge of the existing literature and paste it together in a very concrete form. The second part developed added value, because it was the first time that real world experiences and entrepreneurs out of the concrete fields were part of scientific work. To the best knowledge of the author, it was the first time that empirical work was accomplished in these fields and delivers concrete managerial indications. The third part contributes to the field due to the little examined German crowdfunding market and the comparison to the US market. Several so far unexplored features for successful crowdfunding projects could be identified due to intensive data set work. Practical implications could be considered. A personally developed cluster of success factors and typologies of crowdfunders were given and thus serve as a basis for future discussion in this field.

The author believes that this work is a small step in the research field and can help to build a better understanding of entrepreneurial opportunities in the fields of digital collaboration in the areas of smart city, shareconomy and crowdsourcing. Quotations and inquiries to already published articles underline this assumption.

1.1 Background of the study

Baker (as cited in Hossain and Wigand, 2004) defines collaboration in the business environment as communicating and working together across organizational boundaries. An environment fostering collaboration by aligning collaborative and knowledge working practices within the business paves the way for more effective and efficient ways of working, internally as well as externally with third parties (Evans and Brooks, 2005). With the increasing diffusion of computer networks, virtual or digital collaboration has emerged, referring to the use of information and communication technology (ICT) for the collaboration and collective interaction among diverse parties (Hossain and Wigand, 2004). These communication technologies that connect individuals and businesses range from the telephone (DiMartino and Wirth, 1990) to the Internet and the use of social media tools (Frame et al., 2009). The development of electronic communication technologies enables business to collaborate and

communicate without reference to hierarchical, divisional or geographic boundaries (Evans and Brooks, 2005) and allows information exchange across distributed organizational forms and inter-organizational communication (Fulk and DeSanctis, 1995). Collaborative technology has removed the prerequisite status of physical vicinity to enable the formation of social groups and enhances the diversity of cultures and functions within an organizational working group (Evans and Brooks, 2005).

Several authors describe an organizational form resulting from the spread of ICT within businesses: the virtual organization (Boudreau et al., 1998; Frame et al., 2009). This type of organization does not require employees to be tied to a specific workplace (Fulk and DeSanctis, 1995) or require them to perform services close to the customer and is characterized by collaboration through advanced communication technologies (Boudreau et al., 1998). According to Nohria and Berkley (as cited in Fulk and DeSanctis 1995), virtual organizations are comprised of five dimensions: (1) electronic files replace material files, (2) increased computer-mediated communication for key activities and face-to-face communication in order to maintain organizational cohesion, (3) the organizational structure consists of the organization of information and technology rather than individuals (4) networking and collaborating across firms leads to ambiguous external boundaries, and (5) the generation of global, cross-functional computer-mediated jobs.

Furthermore, the advancement of electronic communication and interaction along with its integration with computing technologies has enhanced its functionalities. While of a purely connective function in the past, communication technologies have enabled the electronic storage and retrieval of information from shared databases, hence allowing for communal communication and collaborations. In addition, these changes allow for richer communication and the exchange of more complex information among a larger variety of parties (Fulk and DeSanctis, 1995). Hence, the emergence of information and communication technology (ICT) provides employees in geographically dispersed locations with the opportunity to communicate, share information and data and collaborate on projects in order to achieve common business goals (Hossain and Wigand, 2004).

The approach of the digital collaboration has already been studied in various scientific fields. The articles have a very broad scientific background, such as forms of communication, technical requirements (ICT) and marketing.

Therefore, the following table is intended to select some interesting aspects and concretize the abstract scientific work about digital collaboration with real life experiences to create the connection to the real world and make it more tangible for readers of this thesis. Business-related collaborations started long before the use of digital media, so some older aspects of co-working are also listed to increase the understanding of the theme. Reasons for this rapid development of digital collaborations are on the one hand the high relevance due to the larger user groups and on the other

hand the importance of spare time oriented living together and the business-orientated economy.

The following table is further developed on the idea of Hinchcliff (2015):

Table 2: Development of collaboration

Stage	Key findings	Sources
Offline	The main offline tools employed by organizations to foster collaboration include telephone calls and face-to-face meetings	(Frame et al., 2009)
	Studies comparing virtual and face-to-face teams found that they exhibit similar levels of communication effectiveness, but a higher level of satisfaction for face-to-face interaction	(Warkentin et al., 1997)
Online Early stage	Data and documents are shared using a data grid or shared data repository that is designed to easily expand access for the new collaboration	(Frame et al., 2009)
	Learning can be enhanced with intranets, which are Web-based, firewall-protected networks that connect all employees through common, hyperlinked interfaces to documents, messaging and multimedia information sources	(Boudreau et al., 1998)
	Emails allow individuals to exchange information with predetermined and specific others	(Leonardi et al., 2013)
	Q&A forums and message boards allow individuals to post a message to a broad but unknown audience	(Leonardi et al., 2013)
	Groupware is more than just an electronic messaging system. It typically integrates electronic messaging with screen sharing, group scheduling, meeting support, group writing and other applications. These features support team leadership, facilitate group processes and extend the team's technical and managerial competence.	(Boudreau et al., 1998)

Online Social Business Era	An integrated <i>enterprise social media platform</i> includes tools such as social networking, microblogging and social tagging for internal communication	(Leonardi et al., 2013)
	1) use of publicly available sites like Facebook, Google+ and Twitter; (2) private implementations of open source or proprietary software, either installed on a company's own servers or acquired as a hosted (cloud-based) software service; or (3) in-house proprietary solutions, often built as prototypes by software vendors for later incorporation into commercial offerings	(Leonardi et al., 2013)
	As a consequence of their private usage, employees are familiar with Web 2.0 applications, have built the trust and are comfortable bringing their private technological expertise even into the corporate context	(Schaarschmidt et al., 2011).
	Collaborators can communicate using video-conferencing tools (such as the Access Grid with application-sharing tools such as the eMinerals JMAST tool) or instant messaging. Web 2.0 social networking tools (e.g. our SciSpace.net tool) enable collaborators to share and document ideas, dialogues, images, dialogues and reports	(Frame et al., 2009)

This development is supported by the further development of data transmission, faster and more flexible applications and the ability of higher scalability. Now, considering the last years, the terms “sharing”, “collaboration” and “networks” are already mentioned. However, the relationship to entrepreneurship is more rarely explored. Therefore, this thesis takes up this scientific gap and fills it with seven relevant publications.

1.2 Research Objectives

1.2.1 Research gap addressed by the thesis

Various articles discuss collaborations in the business world. Collaborations are based on the approach by contributing information, experiences, resources, skills and knowledge to improve the competitive situation of each partner (Speckman et al., 1998). Strong relationships between market players with a more cooperative than competitive approach (Bengtsson and Kock, 1999) fall under the umbrella of the term collaboration (Sydow, 1992). The goal of collaboration is mostly described by equalizing or even over-compensation for personal weaknesses and the transfer of personal strengths in

order to achieve common goals (Bronder and Pritzl, 1992). Other goals of collaborations (also called strategic alliances) are an increased flexibility in incoming orders, better access to potential new customers or markets through existing business relations to a partner, and limiting personal risk or even the access to of resources, which can act only in cooperation. A fundamental aim of collaborations is “joint competitive advantages” (Zentes et al., 1992, p. 20). Collaboration among individuals within an organization and between organizations offers a number of advantages. First, effective collaboration results in significant efficiency improvements and in a reduction of operational costs. Second, it allows organizations to increasingly build cross-functional teams regardless of their office location and ensures the inclusion of all appropriate and skilled people necessary. Third, virtual collaboration significantly reduces travel costs as for example face-to-face meetings can be replaced with video conferences (Evans and Brooks, 2005).

Considering disadvantages of organizational collaboration, appearing costs, a weaker market position or an unfavorable negotiating position can be identified (Porter, 1986). A crucial factor is the fact that such alliances always come together on a voluntary basis.

In light of the economic turbulences and challenges like globalization and demographic changes, many companies experience increasing pressure to innovate in order to secure their competitive position. Especially small and medium-sized enterprises are facing a lot of market challenges and are seeking to establish themselves in an environment characterized by reduced time to market and are pursuing diverse opportunities for continuous innovation. Therefore, SMEs are likely to share resources and benefit from knowledge exchange and collaboration (Schaarschmidt et al., 2011). Further, social and other forms of entrepreneurs require a diverse set of resources, including non-materials such as networks and knowledge as well as material resources such as financial assistance. In order to acquire the required resources, entrepreneurs often draw from collective and collaborative actions. The connections across businesses and the mutual support provide a platform for the exchange of practices, generation of new ideas and spreading of information (Montgomery et al., 2012).

The creation, exchange, diffusion and use of knowledge has been identified as the main source for innovation and in turn the main driver for economic growth (Johansson et al., 2006). In recent years, many companies and especially SMEs have obtained knowledge from an external network composed of a variety of sources such as customers, suppliers, research institutions and other firms in order to drive innovation (Chiaroni et al., 2010). Johansson et al. (2006) agree that innovations result from the complex interaction of numerous parties including individuals, organizations and knowledge institutions. Several authors suggest that the key for successful business operations and sustainable competitiveness is the utilization of superior know-how and capabilities that lead to continuous innovations, serving current and potential future customers (Johansson et al., 2006; Miles et al., 2005). Miles et al. (2005) even recommend a new organizational form that draws from the collaborative network of many organizations and thus makes

full use of every firm's innovation potential. The authors forecast that particularly small and medium-sized enterprises will join a multi-firm network as they do not possess sufficient resources to realize the model of continuous innovation by themselves.

Aldrich and Zimmer (1986) argue that entrepreneurs are embedded in a social context, facilitated by a social network that plays a critical role in their entrepreneurial process. Research has shown that entrepreneurs foster interpersonal and interorganizational relationships in order to gain access to various resources including information and advice of other actors in their network. This embeddedness in a network furthermore assists the entrepreneurial venture in overcoming its liability of newness by obtaining the resource of legitimacy (Smith and Lohrke, 2008). The collaboration within this network is not limited to the start-up stage of the entrepreneurial business but is promoted at later stages to ensure continuous access to business information and advice (Hoang and Antoncic, 2003). According to research by Johannsson et al. (2006), regional networks result in regional innovation systems in which the entrepreneur together with customers, producers, consultants, institutions and research institutes engages in ongoing collaboration and hence facilitates the development of innovation. It follows the assumption that SMEs and entrepreneurs jointly build a small regional cluster that is extended through the attraction of even more like-minded individuals and businesses. This cluster-building is a central aspect of entrepreneurial theory. Building a cluster means committing to a certain region, which can be assumed to be an outdated idea in light of the digital advancement. In fact, the access to the Internet and the strong alignment to online programs as well as contributions to common work projects can be made from anywhere, anytime (Hossain and Wigand, 2004). This argumentation leads to the belief that clusters and social exchange are transferred to an online network via chat, video-conferencing and other ICT tools. Several programs to support collaboration allow the boundaries between "local collaboration" and "digital collaboration" to be merged.

When deciding to engage in collaboration, entrepreneurs face different models of collaboration with different strategic trade-offs. Collaboration networks differ significantly in their degree of openness for membership and their governance (Pisano and Verganti, 2008). For instance, in a very open form of collaboration, crowdsourcing for instance constitutes a very open form of collaboration. In this model, a designated agent or sponsor outsources a task or job to an undefined large group of people through an open call (Howe, 2006). Alternative definitions describe crowdsourcing as a process in which companies broadcast challenges to a crowd, which then offers solutions to these problems and posts them to the online commons (Brabham, 2010). Hence, a large variety of actors can participate, including suppliers, customers and researchers, but hobbyists, students and even competitors can also engage in this form of collaboration. The advantage of such an open collaboration is the large number of potential innovators and idea generators and the attraction of previously not considered but valuable actors to the network. On the other hand, the effectiveness of this open form of collaboration is less compared to that of closed collaboration where only selected and best-suited parties interact. Further, entrepreneurs face the decision of a hierarchical or flat model of

collaboration: in the hierarchical model, a specific organization is able to control the direction of the innovation and capture a large share of the innovation's value. In the flat model on the other hand, these decisions are decentralized or taken jointly by the collaborators, allowing cost and risk sharing as well as the sharing of possible challenges in the innovation process. Pisano and Verganti (2008) suggest four basic models of collaboration that the entrepreneur must decide upon: a closed and hierarchical network (an elite circle), an open and hierarchical network (an innovation mall), an open and flat network (an innovation community) and a closed and flat network (a consortium).

Further regarding the relationship between collaboration and entrepreneurship, this thesis will introduce the reader to some of the most recent phenomena in entrepreneurship, namely the fields of smart city, shareconomy and crowdfunding. It is however to be mentioned that these topics have not been central to research agendas and hence the availability of appropriate literature is limited.

The Intelligent Community Forum (ICF) awards cities as intelligent communities when scoring high in a number of dimensions, including broadband connectivity, knowledge workforce, digital inclusion, innovation, and marketing and advocacy (Nam and Pardo, 2011). However, in the current literature there is a lack of consensus regarding a clear definition of a smart city. Some authors highlight the presence of ICT infrastructure as a prerequisite (Caragliu et al., 2011), others focus on the role of education and human capital for rapid urban growth rates, assuming that innovation attracts a skilled labour force (Berry and Glaeser, 2005), while others argue that the alignment of technology-mediated services, human infrastructure and the establishment of institutions form a smart city (Nam and Pardo, 2011). Furthermore, the relationship between a smart city and entrepreneurship along with its application opportunities remains largely unexplored in academic works.

Another prominent collaboration model is shareconomy, which is commonly understood as the systematic lending and borrowing of objects, especially through private individuals (Bendel, 2014). Belk (2014) further points to the role of the Internet and modern ICT in this collaboration model, with the online housing sharing website "Airbnb" constituting one of the best-known examples (Gerom, 2013). In shareconomy collaborative technologies are highly valued as they support high levels of interaction, as well as communication and information exchange among large groups (Karsten, 2003). However, academic work on shareconomy is still in its infancy stage (Katz et al., 2014) and most literature addresses case studies instead of representative quantitative research.

The phenomenon of crowdfunding has been subject to more extensive research efforts. This model can be regarded as an alternative possibility to receive funding and is especially popular among entrepreneurs who are likely to face difficulties of raising sufficient funds (Cosh et al., 2007). Crowdfunding allows entrepreneurs to turn to a large number of individuals or groups, the crowd, in order to receive small financial

contributions to their business venture (Agrawal et al., 2014; Mollick, 2014). However, most literature on this entrepreneurial model has relied upon rather generic data sets from Kickstarter, the largest crowdfunding site from the United States (e.g. Mollick, 2014). Hence, research on the models of smart city, shareconomy and crowdfunding is in need of more extensive work in general and specifically in regions outside of the United States.

By combining the above-mentioned fields of application in collaborative entrepreneurship with a strong focus on the countries of Germany, Austria and Switzerland, an obvious research gap emerges. This thesis aims to fill this gap and generate new and undiscovered insights in the area as literature for digital collaborations and entrepreneurial opportunities in the models of smart city, shareconomy and crowdfunding within these countries is very rare. While the lack of general literature on smart city and shareconomy makes a focus on certain regions obsolete, research on the phenomenon of crowdfunding needs to set a new regional focus due to the large amount of literature on US-based data sets and analyses.

As research in the fields of smart city and shareconomy in combination with entrepreneurship and entrepreneurial opportunities requires more basic research efforts, a more theoretical approach is appropriate. Crowdfunding on the other hand has been subject to more recent academic and scientific work and therefore a more empirical research agenda can be established that allows the comparison of insights with existing literature and findings. Thus, research in the fields of digital collaboration as entrepreneurial opportunities in the fields of smart city, shareconomy and crowdsourcing with a focus on the countries of Germany, Austria and Switzerland offers opportunities for theoretical, methodical and empirical contributions.

The state of research in the specific fields briefly addressed above led to a rough conceptual framework which gives structure for the thesis and the opportunity to clarify contributions, limitations and options for future research at the end of this work.

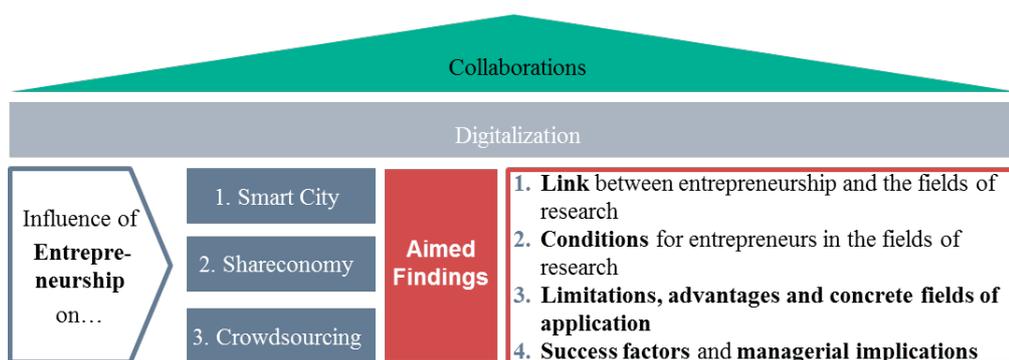


Figure 1: Conceptual framework of this PhD thesis

1.2.2 Scope and objectives of the study

This thesis offers a detailed analysis of entrepreneurial activities in the fields of smart city, shareconomy and crowdsourcing. The focus of this thesis in the broad fields is the digital collaboration and the entrepreneurial opportunities and challenges, combined with concrete managerial implications and concrete fields of activities. Especially the SMEs from the countries of Germany, Austria and Switzerland are considered in the empirical studies.

The combination of the themes of entrepreneurship and the digital themes of smart city, shareconomy and crowdsourcing paves the way for theoretical and empirical development in the near future. This thesis has to be rated and evaluated as a basis in this field of digital collaboration because the research in the fields is very young and thus only a limited amount of scientific literature is available. The results of the thesis provide numerous approaches for further research and thus it represents a strong contribution, especially in the countries of Germany, Austria and Switzerland. These countries should be considered as interesting and meaningful because economically they form the heart of Europe, in particular Germany. In order to obtain new insights into the young research fields, the study has been taken in two ways:

First, reviewing existing literature in the fields of smart city, shareconomy and crowdsourcing with a focus on entrepreneurial opportunities.

Second, generating empirical data to prove the existing literature, confirm or reject existing hypotheses and build our own insights.

In all seven publications, the central research question is: Are there business opportunities for SMEs in the fields of smart city, shareconomy and crowdsourcing, and what specific fields of application and recommendations of implementation are to be identified (especially in the countries of Germany, Austria and Switzerland)?

The following sub-questions are the derived, roughly related research questions for the seven articles and support the answering of the main question:

1. In what form and to what degree do smart-city-specific characteristics and fields of application contribute to entrepreneurial activities?
2. What are the connections between the up-and-coming field of shareconomy and entrepreneurship?
3. What are the conditions for entrepreneurs using crowdsourcing in general and crowdcreation in particular?
4. To what extent do the six characteristics of smart city apply to the real world experiences, what other factors are of importance, and what are the interconnections between the identified factors?
5. Which factors of shareconomy are really relevant for entrepreneurs?

6. What makes crowdfunding successful? Which combinations of key success factors of crowdfunding are relevant?
7. Which individual aspects of factors for crowdfunding projects ensure the success of crowdfunding campaigns?

The structure of the thesis and the order of the papers have been deliberately chosen and represent only a conscious selection of publications of the author, all written in the time of the writing of the thesis. The research process starts with an extensive literature review. Focuses are the fields of research of smart city, shareconomy and crowdsourcing, each with a focus on entrepreneurial opportunities. This part can be regarded as a base creation. However, this work is crucial and with a fundamental impact on further research by creating separate definitions and clear delimitation of research. By creating a base, the articles are built in a very similar way (publications 1, 2 and 3). The second part is built on quantitative analyses of entrepreneurial activities in the fields of smart city and shareconomy through in-depth interviews with German, Austrian and Swiss entrepreneurs. Through the development of a deep understanding of the research fields through the literature review in the first part of the thesis, the already existing insights could be checked and new insights could be developed through close examination of the entrepreneurial activities in the real world. Therefore, the second part of the thesis is the logical addition and provides deep insights in a so far almost unexplored field of research (publications 4 and 5). The logical third step of the thesis is the qualitative analysis. The reason is bisected, on the one hand to demonstrate the author's skillset to apply all relevant scientific methods and on the other hand to gain deeper insights of the behaviour of entrepreneurs in crowdfunding projects as a sub-topic of crowdsourcing with a large number of data sets. The results were compared with the dominating insights from US-based analyses and small, so far unexplored features for ascertaining the probability of success could be identified (publications 6 and 7).

Summarizing, the thesis provides a theoretical contribution to the fields of smart city, shareconomy and crowdsourcing by addressing the research objectives and gives very concrete, reproducible managerial implications. Considering the theoretical perspective, the creation of a definition for the fields of research under consideration of all existing literature and the sharp delineation of fields of application are to be highlighted. From the practical perspective, the matching of the existing literature with the real life experiences and the identification of small adaptations of existing success factors in the field of crowdfunding form the highlights from the perspective of the author. The thesis provides a relevant contribution to research in the fields of digital collaboration. Since the investigated fields are very young and very future-oriented, the articles of this thesis serve as a basis for distinctive discussion, further development, criticism and support. Due to the relevance of the topics and the focus on SMEs, the attractiveness for researchers and managers is ensured.

1.3 Structure

The thesis is structured as followed. The first chapter (Introduction) provides a background to the study and introduces the scope of the research and research objectives. The second chapter starts with the theoretical foundations of smart city, shareconomy and crowdsourcing. The interaction between the three themes and the entrepreneurial fields of application and business models are in the scope. The third chapter summarizes the methodological issues of the study execution, and describes the methods used in the literature review, qualitative (in-depth interviews) and quantitative research (fuzzy set Qualitative Comparative Analysis and binary logistic regression analysis) and research design applied in the thesis. The fourth chapter describes the objectives, content and results of the seven publications included in the thesis. The final, fifth chapter concludes the work by answering the research question of the study and proves a description of the thesis's contribution to the existing body of knowledge.

A logical construct of the seven publications included in the thesis is provided below. The table offers a detailed description of research questions and brings the publication together into one complete work.

Table 3: Research questions, objectives and publications

Research questions	Objective	Publication title	Research method and data
Publication 1: In what form and to what degrees do smart-city-specific characteristics and fields of application contribute to entrepreneurial activities?	To provide basic knowledge of the young research field of smart city and identify potential entrepreneurial activities for further research	The Smart City as an Opportunity for Entrepreneurs	Literature review
Publication 2: What are the connections between the up-and-coming field of shareconomy and entrepreneurship?	To generate background knowledge of the shareconomy and identify potential entrepreneurial activities for further research	The Shareconomy as a Precursor for Digital Entrepreneurship Business Models	Literature review

Publication 3: What are the conditions for entrepreneurs using crowdsourcing in general and crowdcreation in particular?	To produce background knowledge of crowdsourcing in general and crowdcreation in a more detailed approach	Crowdcreation as a Dimension of Crowdsourcing: Conditions for Entrepreneurs	Literature review
Publication 4: To what extent do the six characteristics of smart city apply to the real world experiences, what other factors are of importance, and what are the interconnections between identified factors?	To analyze the real world experiences of entrepreneurs from the field and compare them with the existing literature	Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany	Qualitative study; in-depth interviews; 12 entrepreneurs from Germany, Austria, Switzerland
Publication 5: Which factors of shareconomy are really relevant for entrepreneurs?	To analyze the real world experiences of entrepreneurs from the field of shareconomy and compare them with the existing literature	Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries	Qualitative study; in-depth interviews; 14 entrepreneurs from Germany, Austria, Switzerland
Publication 6: What makes crowdfunding successful? Which combinations of key success factors of crowdfunding are relevant?	To compare crowdfunding campaigns and identify options for entrepreneurs which are success factors through combination of features	Strategies for reward-based crowdfunding campaigns	fuzzy set/Qualitative Comparative Analysis (SPSS), 446 data sets from a German crowdfunding platform

Publication 7: Which individual aspects of factors for crowdfunding projects ensure the success of crowdfunding campaigns?	To identify options for entrepreneurs to optimize the crowdfunding campaigns and increase the probability of success for their future campaigns	Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs	Binary logistic regression analysis (SPSS), 432 data sets from a German crowdfunding platform
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1.4 Definition of key terms

Digital collaboration – co-working with the help of mobile devices, the Internet and the unlimited access to these sources. Content of co-working is the sharing of knowledge and information. It opens global co-working regardless of location and time zone. This concept allows the integration of a broader circle to work on specific themes. Drivers of this movement are high Internet usage, email, social media, apps and open data.

Entrepreneurship – “is described as a dimension of strategic posture represented by a firm’s risk-taking propensity, tendency to act competitively aggressive, proactive manners, and reliance of frequent and extensive product innovation” (Covin and Slevin, 1991, p. 7).

Smart city – is a concept to reduce the problems resulting from urban population growth and rapid urbanization like waste, pollution or war of spaces (Chourabi et al., 2012). The system is based on information and communication technologies (ICTs) (Caragliu et al., 2011) and digital technologies. The strategy tries to connect the three key factors of technology, people and institutions (Nam and Pardo, 2011). Goal of the development is the creation of a more liveable city, economic, social and environmental sustainability, reducing costs and resource consumption and integrating the citizens more actively (Hall, 1988).

Shareconomy – the compound term of sharing and economy refers to the change in consumer behaviour. Instead of buying and owning goods, the concept is based on sharing. Background of sharing is the approach of Weitzmann (1984), that the wealth for all participants increases, the more participants join and share. Under the umbrella of shareconomy three different sub-categories are known: sharing of goods, sharing of digital content and sharing of intellectual content. The wide availability of Internet access and online platforms for sharing support the development.

Crowdsourcing – also a compound term of crowd and outsourcing. It is also called wisdom of the crowd (Kittur et al., 2007). The concept refers to the outsourcing of

corporate tasks and structures to third parties, here to partly unknown, anonymous workers (crowd). This concept is based on the Internet and the unlimited access to labour force thanks to globalization. Four different sub-categories are known: crowdvoting, crowdcreation, crowdfunding and crowdwisdom (Howe, 2006).

2 Theoretical point of departure

This thesis includes three key topics which are presented below: smart city, shareconomy and crowdsourcing including the sub-topics crowdcreation and crowdfunding. These key aspects are associated with entrepreneurial fields of application. Therefore, the three aspects are analyzed in detail in the following sections and linked with entrepreneurship.

The chapter concludes with a positioning of the work and a visualization of the relationships between the three key aspects.

2.1 Smart city and entrepreneurial opportunities

The depopulation of rural areas and migration to cities will continue. Smart city presents one option of urban living, urban development and living together in cities or even megacities in the near future (Winters, 2008). This development may offer entrepreneurial opportunities, which is considered in this thesis.

Defining “smart” cities, also called “intelligent”, “cyber” or “digital” cities, is almost impossible (Allwinkle and Cruickshank, 2011). Different approaches are subsumed under the umbrella of smart city (Lombardi, 2011). The term “smart city” is sometimes criticized as a buzzword or a hype due to a vague definition and the resulting very wide range of application fields. Four different approaches are consistently repeated: firstly, green or sustainable cities, secondly, cities with a broad offer of ITC services and applications, third, the connected city with all entities to avoid traffic jams or pollution, and fourthly, the intelligent city council with optimized processes (Lombardi, 2011). Another approach is to define smart city in a more abstract way, namely as a “strategic device to encompass modern urban production factors in a common framework” (Caragliu et al., 2011).

These production factors can vary in detail, but the distinction between hard and soft factors is generally used.

Potential hard factors are technologies (e.g. ITC) (Jensen et al., 2015), built infrastructure (Komninos et al., 2013) and natural environment (Chourabi et al., 2012). Soft factors are people and communities, economy and management and organization governance, policy context (Chourabi et al., 2012). Another approach is the division into six aspects: smart economy, smart people, smart governance, smart mobility, smart environment and smart living (Giffinger et al., 2007; Perera et al., 2014).

The communicated goals of smart city are also multi-layered: raising the quality of life and productivity as well as the growth effects of human capital development (Shapiro, 2008), sustainability including waste management (Perera et al., 2014) and saving resources and collaboration (Schaffers et al., 2011).

Smart city faces several challenges, the most often discussed of which is the availability of working IT infrastructure (including wireless Lan, servers, storage). More issues are data security and privacy (Townsend, 2014), big data or glassy (transparent) customers, responsibility and operation costs (Chourabi et al., 2012).

Concrete examples of smart city are hard to find, due to the lack of a concrete definition. Giffinger et al. (2007) identified 70 medium-sized cities in Europe. Outstanding results could be achieved by cities in Luxembourg, Scandinavia and the Benelux. Internationally, San Francisco (Glaeser and Berry, 2006; Walker, 2009), Singapore (High, 2015), Barcelona (Bakici et al., 2013; High, 2015), Nice (environment) (High, 2015; Schaffers et al., 2011), Doha, Taipei, Tel Aviv and Cape Town (Nam and Pardo, 2011), Stockholm (traffic) (Nam and Pardo, 2011) and Amsterdam (Hollands, 2008) have been identified.

Considering smart city in the search for entrepreneurial behaviour and opportunities, the first scientific elaborations started in the later years of the 20th century in a global, more theoretical approach (Cocchia, 2014). Case studies were created in the early 2010s. However, empirical work in the field of smart city is still rare, and in-depth interviews have, to the best of our knowledge, never been undertaken. Therefore, the search for and identification of entrepreneurial opportunities is mostly based on adjacent areas, transfers or literary work. Concrete examples are innovative ecosystems, user co-creation or so-called share economy or shareconomy, living labs or laboratories of innovation (Batty et al., 2012) and resource sharing (Schaffers et al., 2011). Another opportunity could be the storage and analysis of the data flow or “traces” (Pan et al., 2013) – also known as “big data” (Batty, 2012; Kitchin, 2014) or the future Internet (Hernández-Muñoz et al., 2011), which is also called Internet of things.

This part of the thesis is one of the first papers which covers the combination of smart city and entrepreneurial opportunities. This thesis offers a concrete definition of smart city and limits the range of application fields significantly.

2.2 Shareconomy and entrepreneurial opportunities

Another novel digital collaboration that has developed in recent years is called shareconomy. Shareconomy describes the changing consumer behaviour through sharing goods (Ozanne and Ballantine, 2010) and wisdom (Belk, 2010). The base for this movement is the availability of the Internet, providing an opportunity for unlimited access and exchange between users (Belk, 2014). The digital prerequisite of platforms offering, sharing and interacting is absolutely necessary and assists users in sharing in an organized way (Balck and Cracau, 2015).

The term shareconomy consists of the two words “share” and “economy”. Considering the first part “share”, possible objects of exchange are physical objects (e.g. housing, tools, cars, bikes, clothes), digital (e.g. music, data, pictures) or knowledge (e.g. reviews for hotels or restaurants, encyclopedias like Wikipedia) (Belk, 2014). Regarding the

second part “economy”, a massive change in consumer behaviour is attested. The shift away from self-owned property (Balck and Cracau, 2015), the perceived lower value of former status symbols like cars and the liberal way of life of the younger generation are cited reasons for the boom in sharing (Lawson, 2010).

Shareconomy is also named “sharing economy” (Belk, 2014), “collaborative consumption” (Belk, 2014), “peer-to-peer marketplace” (Zervas et al., 2015), “fractional ownership” (Lawson, 2010) or “democratic economy”, just to mention the most cited ones. Despite various names, the core of the motion is identical. Offering one item to a broader group of potential users via digital publications, compensation for the use of the items is mostly monetary (e.g. pay per use) (Zervas et al., 2015) but also includes non-monetary compensation (e.g. appreciation, recognition).

Shareconomy is a young but rapidly growing movement and therefore noteworthy. The foundation of the construct was provided by Weitzmann in 1984, presenting the intelligence of the crowd or “crowd wisdom” as the driver (Weitzmann, 1984). Through the increasing number of inhabitants in the big cities, multiple issues emerged. In addition to the challenges that are addressed by the concept of smart city like traffic control, pollution or garbage disposal, shareconomy faces the issues of “war of spaces”. Limited storage space or limited parking lots lead to the simple idea of sharing. In these examples: sharing bikes, sharing cars or sharing tools (Lamberton and Rose, 2012).

A recognizable driver of this movement is the social change of people (Lawson, 2010). Generation Y is, according to several surveys, not only interested in career success. The trend is towards a higher demand of work-life balance, greater social commitment, more interaction and living in a more sustainable way (Kelly et al., 2014). Sharing fits very well. Sharing means interaction with other people, saving money and resources (Balck and Cracau, 2015).

Controversially described is the entrepreneurial approach of the shareconomy movement. On the one hand, the part of sharing, the social or even green mindset is dominating. On the other hand, the monetization of the idea is pervasive (Lawson, 2010). The idea owner, the platform provider (intermediary) and also the people sharing items want to earn money (Lamberton and Rose, 2012) This apparent contradiction is much discussed – profit-oriented enterprises are acting under the supposed social umbrella. Prominent examples are Airbnb (housing) facing legal litigation because of local housing laws and regulations as well as unclear insurance and tax laws at the moment (Coldwell, 2014).

Through an extensive literature review with the focus on the last five years due to the young status of the discipline, this thesis offers a holistic literature review instead of focusing on individual areas (e.g. sharing music). Also, this thesis contains an article with in-depth interviews with 14 entrepreneurs in the field of shareconomy. With our current knowledge, this detailed work with entrepreneurs is unique and constitutes a concrete added value for the research in this field.

2.3 Crowdsourcing and entrepreneurial opportunities

After presenting two kinds of digital collaborations, crowdsourcing is another important subspecies of shareconomy and therefore a logical continuation of smart city.

Like shareconomy, the term crowdsourcing is composed of two terms, “crowd” and “sourcing”. With crowd, the anonymous mass in the Internet is meant, often called community. Sourcing is, in the era of globalization, often equated with outsourcing, the issuing of tasks to third parties (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). Outsourcing is mostly connected with the hope for variable costs instead of fixed costs, the involvement of experts, the use of competitive advantages, increased flexibility or gaining creativity. These arguments also apply to crowdsourcing, but with the major difference that the fulfillers of the tasks, i.e. the crowd, are mostly completely anonymous (Zhao and Zhu, 2012).

The origin of the movement can be found in the IT area, where open-source applications and operating systems were very popular during the late 1990s and early 2000s (Bagozzi and Dholakia, 2006; Doan et al., 2011). Individual changes and optimizations could be created and offered the broader user group, with the common goal of improving the general usability and functionality (Hars and Ou, 2002). Thus, the central aspect of crowdsourcing is well described. The anonymous mass knows more than the individual – the wisdom of the crowd represents greater intelligence, creativity and speed, more diverse opinions due to different cultural backgrounds and 24/7 implementation due to different time zones (Brabham, 2008).

The option to involve the crowd is based on a tripartite construct: first, the project owner who gives the job, assignment or problem away; second, an intermediary who presents the job on the platform to the crowd; and third, the community of Internet users with a common interest to participate in small assignments in various areas (Vukovic, 2009). The most popular areas are product development, design, research and development, and idea generation (Tripathi et al., 2014). In exchange for the service of performing a task or presenting a solution to a posted problem, the crowd expects some form of compensation. This has been studied by numerous researchers and fits some of Maslow’s basic needs: a financial reward, an opportunity to develop creative skills, having fun, sharing knowledge, an opportunity to take up freelance work, love of the community and an addiction to the tasks (Estellés-Arolas and González-Ladrón-de-Guevara, 2012).

The fields of activity for the crowd can vary. Crowdsourcing is divided into smaller fields of application. Generally the division into three types is supported in the existing literature (Vaca, 2015). The first approach is to integrate the customer in the development of products and benefit from the fusion of the pure consumer to a partial producer, a so-called prosumer. The concept of concrete, creative customer integration in the product creation is called *crowdcreation* (Tripathi et al., 2014). Concrete examples include the online graphic design marketplace 99designs, where users can

participate in contests to design logos, websites and other products (Tripathi et al., 2014) and the web-based T-shirt company Threadless.com, which realizes the design process for their products through an online competition in which everyone can participate and win a monetary award if their design is picked (Brabham, 2008). Howe (2006) adds a fourth component, crowdwisdom, which is more generally the whole concept of crowdsourcing and the intelligence of the anonymous mass.

A different aspect of integrating the community in the product development process is *crowdvoting*, where the crowd is able to vote for designs, features or colours (Tripathi et al., 2014). Scoring can be five-stage star-ratings or pure free text fields, but a first contact of the product to the market is secured through recommendations, evaluations and scoring. Examples are TripAdvisor evaluations for restaurants and hotels around the world (Kremer et al., 2014) or Digg, a website that allows users to vote for the most interesting news story that will then be published openly on the website (Malone et al., 2009). With the help of the crowd, entrepreneurs engaging in crowdvoting aim to organize vast amounts of information in an efficient manner (Noble, 2012).

Another sub-species of crowdsourcing is *crowdfunding*. Crowdfunding presents a new option for financing ideas and concepts, instead of using venture capital or the old-school way of banking loans credits (Mollick, 2014). Crowdfunding uses the community to gain mostly small amounts of money in return for small rewards, honouring the funding (Agrawal et al., 2014). Kickstarter, the largest crowdfunding community, probably constitutes the most prominent example of crowdfunding. The website connects entrepreneurs with funders that receive tangible but non-monetary rewards in exchange for their contributions (Kuppuswamy and Bayus, 2014). Project owners mostly aim to raise small amounts of capital for a certain project but also demonstrate demand for a product or create interest in a new product. People directing their funds at the posted project participate out of philanthropic motives or expect a reward in return for their contribution. This reward can take the form of a monetary reward, equity stakes in the business or granted access to the product prior to the official release date (Mollick, 2014).

Crowdsourcing fosters entrepreneurship at the individual level as well as entrepreneurship in an enterprise environment. This form of digital collaboration offers individuals participating in the crowd an opportunity for entrepreneurship by utilizing their creativity and ideas towards a certain project (Brabham, 2008). Furthermore, the creation of intermediary platforms and marketplaces such as CrowdSpirit and iStockphoto fosters opportunities for entrepreneurial activity (Vukovic, 2009) as well as models such as crowdfunding, which allow entrepreneurs to finance their business venture (Schwienbacher and Larralde, 2010). However, entrepreneurs outsourcing a certain task or problem to the crowd must pay attention to balancing openness for different user groups with quality of participation (Doan et al., 2011). Doan et al. (2011) identify four key challenges in engaging crowdsourcing models. First, how to recruit and retain members of the crowd. Second, defining the scale and scope of users'

participation. Third, identifying ways to combine users' contributions and evaluate them. Last, establish rules and procedures for system misuse.

While the fields of crowdsourcing and especially crowdcreation are almost scientifically untouched, the field of crowdfunding is booming right now. Two special editions of leading journals in the field of entrepreneurship covered crowdfunding at the start of 2015. It should be noted that these articles analyze American crowdfunding platforms, more concretely the biggest one "Kickstarter" with more than 50,000 data sets, and focus on the financial aspect such as microfinance, microlending or investment strategies. This thesis tries to identify success factors for crowdfunding projects. The data set comes from Germany and is significantly smaller than the compared article. This leads to new insights through the applying of new methods. In addition, concrete practical implications are developed, which are also new scientific territory.

2.4 Positioning of the study

This thesis is based on three main aspects: smart city, shareconomy and crowdsourcing. The starting point is the detailed analysis of the young construct smart city. From this point, the work focuses on the aspects of digitalization and collaborative work. Innovative approaches, collaboration and opportunities for entrepreneurs are central tasks which are developed. Therefore, the topics shareconomy and crowdsourcing (including crowdcreation and crowdfunding) can be viewed as a logical continuation. The following figure illustrates the relationships between the fields.

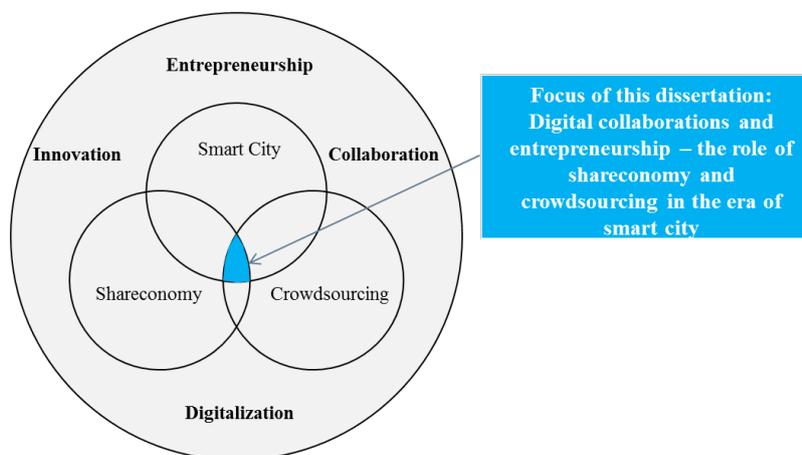


Figure 2: Visualization of the thesis scope

3 Methods

Research design and methods

This chapter discusses the methodological approach taken in this thesis. It consists of the research strategy, the research design, the sampling and data collection (literature review, qualitative and quantitative approach), used statistical methods, validity and reliability of the study and, finally, the research implications.

3.1 Research strategy

This thesis follows the general approach of scientific work. The use of qualitative methods is followed by the use of quantitative methods, according to the theory of empirical social research (Lazarsfeld and Oberschall, 1965; Punch, 2013). Making it more concrete for this specific case, the process of the research approach taken is as follows. First, a base for scientific work is generated with a detailed literature review and the forming of theories about certain aspects of the natural world (Olsen, 2004). Second, the theories are tested through qualitative approaches as well as by exploring so far unknown areas through real world experiences in expert interviews (Hyde, 2000). The last and third step is reviewing the findings of the qualitative approach through a quantitative research effort, benefitting from a larger case number and hence more generalizable results (Sandelowski, 2000). Therefore, this thesis follows the classical approach suggested by the theory of science: moving from the general to the more specific.

A second important aspect of this thesis's research strategy is the triangulation research strategy (Olsen, 2004). By combining different research methods the weaknesses of each method can be compensated and counter-balanced by the strengths of the other methods, leading to higher research effectiveness and validity (Jick, 1979). The field of triangulation research strategy is multi-layered. The author of this thesis follows the approach of using multiple data sets, sources, scientists and methods to gain better results than just following a one-dimensional research approach (Mayring, 2002).

3.2 Research design

The thesis's research design follows the classical theory of science approach. This involves building a literature base, defining fields of science, creating hypotheses, testing them qualitatively with a smaller circle of participants due the combination of deductive and inductive approaches and, finally, finding proof for the theories with a higher number of cases by a standardized quantitative process (Cooper and Schindler, 2013).

The foundation of this thesis is mainly based on three articles with the seminal work of existing literature on the subjects of smart city, shareconomy and crowdsourcing. This is a necessary step as these three fields are very young and largely unexplored in the academic world, as demonstrated by a lack of common definitions and a lack of empirical studies of these emerging phenomena (Caragliu et al., 2011; Estellés-Arolas and González-Ladrón-de-Guevara, 2012).

The qualitative approach employed in this thesis largely relies on two articles, the first one discussing 12 in-depth interviews on the topic of smart city (Publication 4: *Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany*), and the second one comprising 14 in-depth interviews on the subject of shareconomy (Publication 5: *Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries*). Gathering information and processing it through a qualitative approach involves describing a phenomenon in a very deep and comprehensive manner (Rhodes, 2014). The combination of deductive and inductive approaches creates the opportunity to gain new insights and to sharpen, confirm or even reflect previously gained insights which are presented in existing literature (Cooper and Schindler, 2013). Hyde (2000) describes the deductive approach as a theory testing approach, starting from the theory and the general existing knowledge on the matter and applying it to specific situations. The inductive research approach on the other hand is rather a theory building process, with empirical scientific work marking the starting point (Hyde, 2000). Here, research moves from a particular case and derives general statements and findings in support of the theory (Cooper and Schindler, 2013; Hyde, 2000). Combining these two elements in in-depth interviews is challenging, but simultaneously offers the best opportunity for gaining knowledge. The qualitative approach is able to provide a deeper understanding of new and so far more unexplored fields (Rhodes, 2014).

Two articles manifest the quantitative approach covered in this thesis. Both articles explore the area of crowdfunding. In the first article, the combination of success factors for the crowdfunding phenomenon are identified (Publication 6: *Strategies for reward-based crowdfunding campaigns*), while in the other article new and so far unexplored success factors for crowdfunding projects are examined (Publication 7: *Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs*). The quantitative approach includes the gathering of information across a larger number of participants (in our case data sets) and applies statistical analyses to make stronger and maybe sharper derivatives (Rhodes, 2014). The applied statistical techniques are in one case the partially applied fuzzy set Qualitative Comparative Analysis (fsQCA), which is a new analytic form in scientific work in the fields of marketing and entrepreneurship (Wagemann and Schneider, 2010). The other method employed is a more standard approach. A binary logistic regression analysis was used to identify the most influencing key factors in crowdfunding projects. The quantitative approach enables the collection of a large number of participants and allows generalizing but is not suitable for little explored fields (Rhodes, 2014). Therefore it was used for the more popular part, crowdsourcing and its sub-category crowdfunding.

Internet research was started with the aim of identifying active entrepreneurs in the field of smart city and shareconomy. After listing and discussing the skill set of the potential interviews among the authors, shortening the list again and sending e-mails to the group, 12 (smart city) and 14 (shareconomy) experts were highly motivated to participate in this scientific work. With more than ten interviewees, a sufficient number of participants has been found to ensure reliable results (Groenewald, 2004). The interviews provided added value and the learning curve did not flatten too soon (Turner, 2010). The interviews were accomplished in person or via Skype to be able to see the personal reaction and emotions on both sides (Cooper and Schindler, 2013). The interviews were conducted in the German language, recorded, transcribed and finally coded. Coding was carried out according to the four-eye principle to avoid subjective influences and only then were the findings used and translated for the article in the English language. The goal in the interviews was the combination of testing already known aspects from the literature (deductive approach) and generating completely new findings (inductive approach) through real life experiences (Hyde, 2000).

The following table presents details about the 12 entrepreneurs who are interviewed for the smart city research. All interviews took place in Germany. Skype calls were used. The ration between male and female was mixed and not part of the research.

Table 4: Detail of the participating entrepreneurs - publication 4

#	Industry	Main product	Employees	Established
1	Transportation services	Application	5	2012
2	General services	Coding of applications	9	2011
3	Transportation services	Application	20	2012
4	Mobile Marketing	Application	13	2009
5	Transportation manufacturing	Electronic conveyance	60	2009
6	Sustainability services	Consulting	2	2011
7	Local retail services	Platform	6	2013
8	Sustainability services	Application	3	2011
9	Urban development services	Consulting	-	-
10	Energy service	Services	15	2012

11	Mobile Marketing	Application	7	2012
12	Transportation services	Application	3	2011

The next table presents the 14 entrepreneurs for the publication about shareconomy. 3 females were interviewed (out of 14 interviews in total), but now distinction was conducted. All 14 interviews were conducted in March and April 2014, the language was German and Skype calls were used in all cases.

Table 5: Detail of the participating entrepreneurs - publication 5

#	Business model field	Country	Employees	Established
1	Car-Sharing	Germany	11	2010
2	Community sharing of souvenirs	Switzerland	4	2012
3	Sharing of clothes	Germany	1	2012
4	Sharing of travel experiences	Austria	5	2013
5	Sharing of parking lots	Germany	5	2013
6	Sharing of parking lots	Germany Switzerland	33	2012
7	Sharing of utility objects	Switzerland	6	2013
8	Community sharing of souvenirs	Germany	3	2013
9	Sharing of all items	Switzerland	24	2012
10	Sharing of media items	Germany	5	2012
11	Sharing of children toys and clothes	Germany	6	2012
12	Sharing of utility objects	Austria	3	2012
13	Sharing of services	Switzerland Germany	35	2013

14	Sharing of camping mobiles	Germany	3	2013
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3.3.3 Quantitative work

The third and last stage of the thesis is comprised of two empirical articles in the field of crowdfunding with the data set created in the autumn of 2014. The basic framework of about 450 data sets was provided by a German crowdfunding platform and handed over to the author of this thesis for the research. Similar to Mollick's (Mollick, 2014) research design, the data set includes relevant information about the performance of specific crowdfunding projects. Examples of data collected are the number of supporters, achieved budget, or the name of the project owner, just to mention a few. The additional detailed manual work of gaining deeper insights of the individual projects without the technical assistance of the database was performed by the author himself. Objective supplements were carried out; the reason behind the manual work was the lack of automatism and new research ideas. Examples of the additions are personal information about the project owner (gender, picture), presence of pictures, videos, blogs or comments, or the support of other crowdfunding projects on the platform by the project owner. This intensive work with the data set and the projects was carried out according to the four-eye principle to ensure traceability, flawlessness, validity and reliability (Pasian, 2015). Because of two different statistical methods and different goals in the two articles, the final data set varies (446 and 432). Both data sets were calculated with the help of the statistical software SPSS. Used statistical methods are fuzzy set Qualitative Comparative Analysis (fsQCA) and a binary logistic regression analysis.

3.4 fuzzy set Qualitative Comparative Analysis (fsQCA)

fuzzy set Qualitative Comparative Analysis (fsQCA) is a relatively new methodology developed by the social scientist Charles Ragin for obtaining linguistic summarizations from data that are associated with cases (Mendel and Korjani, 2012). As qualitative comparative analysis (QCA) has been designed for the analysis of crisp sets, i.e. assigning each case to either membership or non-membership of a certain category, fuzzy set Qualitative Comparative Analysis circumvents the necessity of force-fitting cases into one of two categories by allowing for partial membership (Ragin, 2008). Whereas conventional statistical methods are mainly based on correlations, this method establishes rules summarizing the sufficiency between subsets of different combinations of the causal conditions and the outcome, thereby presenting a logical connection between causal conditions and an outcome (Korjani and Mendel, 2012). Analysis results are then presented in a so-called Boolean truth table, which presents the logical connections between combinations of causal condition, with each rule forming a possible path from the causal conditions to the outcome (Mendel and Korjani, 2012).

3.5 Binary logistic regression analysis

Logistic regression analysis models the relationship between a dependent (successful crowdfunding projects) and one or more independent variables (here the elements of a crowdfunding campaign), and allows an assessment of the fit of the model as well as the significance of the relationships between dependent and independent variables (Hosmer and Lemeshow, 2004). Binary logistic regression estimates the probability that a characteristic is present (here estimated probability of successful crowdfunding projects) given the values of explanatory variables, in this case single categorical variables like picture of the project owner or budget aim of the project (Cooper and Schindler, 2013; Hosmer and Lemeshow, 2004).

3.6 Validity and reliability of the study

The requirements for a thesis are multi-layered. Validity and reliability are key aspects of all research (Brink, 1993). A distinction is made in three parts: moral, stylistic and technical requirements. The first one is the moral requirement, the intellectual honesty. In fact, it is a commitment to independent work without plagiarism and improper methods that is closely linked to ethical behaviour in research design and implementation (Cooper and Schindler, 2013). The stylistic aspect is relevant for this thesis, but also for every single article included. Objectivity, simplicity of the structure, accountability and classical language without professional jargon are examples for the writing (Cooper and Schindler, 2013). Further requirements for linguistic style and the written presentation of the text are citation, fonts, spacing, passivation of texts among others (Hyland, 2004). Besides moral and stylistic requirements, the technical requirements are also to be considered. Technical requirements include objectivity, reliability and validity. To underline the trust in this thesis, various applications of these requirements are listed below and are to be separated between qualitative and quantitative approaches.

In the qualitative research theory, the central aspects are credibility, authenticity, transferability and trustworthiness instead of objectivity, validity and reliability, which are more connected to the quantitative approach (Janetzko, 2008). Selection of interviewees, coding and analysis are however also under the umbrella of objectivity, validity and reliability. For the selection of interviewees, the author followed the iterative process approach and sampling criteria suggested by DiCicco-Bloom and Crabtree (2006). The coding and the analysis were accomplished according to the four-eye principle to avoid subjectivity. Through the records, it would be possible to repeat the analysis by a third party.

In the quantitative research theory, the terms of objectivity, reliability, internal validity and external validity are relevant (Janetzko, 2008).

Objectivity or scientific objectivity is the highest goal for scientists and “addresses the question if the data collection is independent of the persons involved in data collection

and independent of the devices used” (Janetzko, 2008, p. 3). Researchers must strive to avoid bias and participants in surveys and interviews should not be influenced by including certain information that could lead to misinterpretation or the omitting of some form of evidence (Cooper and Schindler, 2013). The results should not be influenced by perspectives, values, commitments or personal interests and the researcher should take a neutral position (Payne and Payne, 2014).

Reliability means trustworthiness, steadiness and dependability and is “concerned with the question of whether one’s findings will be found again” (Merriam, 1995, p. 55). Used methods must present the same results in a potential repeating, especially accomplished by a neutral third party (Janetzko, 2008). However, especially in social science it is difficult to observe the same phenomenon several times due to changing human behaviours. Instead, researchers are advised to strive for what Lincoln and Guba, 1985) call “dependability” or “consistency” (Merriam, 1995). The scientific work needs to distinguish between facts, rumours, personal opinions, guesses or interpretations.

In terms of validity, several procedures have been identified by researchers and include methods employed in this thesis such as triangulation and close collaboration with participants during the research process (Creswell and Miller, 2010). Further, validity can be divided into internal and external validity (Campbell and Stanley, 1963). Internal validity is an often regarded aspect in research and is, “in terms of credibility and authenticity, often identified as a strength of qualitative research” (Weerawardena and Mort, 2006, p. 27) and hence refers to the degree of excellence a study was accomplished to. The research construction, the findings and the interpretation are under consideration in this aspect. Internal validity refers to the question of whether the derived conclusions of a relationship really imply cause (Cooper and Schindler, 2013). High internal validity allows a stronger self-confidence with the results. External validity on the other hand is the question about the capabilities of how well data and theories from one setting apply to another (Brink, 1993), in our specific case the destination selection of Germany, Austria and Switzerland. According to Campbell and Stanley, 1963, p. 5), “external validity asks the question of generalizability: to what populations, setting, treatment variables and measurement variables can this effect be generalized?”.

3.7 Research implications

Research in the field of entrepreneurship has greatly benefitted from researchers borrowing prominent theories from other fields, such as sociology and economics, and applying them to the entrepreneurial context (Zahra, 2007). But regarding the specific context in which the entrepreneurial activity is observed is an essential factor in understanding the motivation and considering the influence of external and internal factors on the phenomenon (Welter, 2011). In fact, Johns (2006, p. 386) defines context as “situational opportunities and constraints that affect the occurrence and meaning of organizational behaviour”.

Borrowing concepts from other research domains and applying them to new entrepreneurial phenomena leads to research suffering from inadequate context placement and obvious and inconclusive results (Zahra, 2007). As a consequence, academics often complain about the lack of good and valuable theory in the domain of entrepreneurship (Zahra, 2007). Hence, authors suggest contextualizing theory by “linking observations to a set of relevant facts, events or points of view that make possible research and theory that form part of a larger whole” (Rousseau and Fried, 2001, p. 1). Furthermore, researchers advocate and encourage the use of diverse and creative theory building to reveal novel findings (Phan, 2004), which includes “activities like abstracting, generalizing, relating, selecting, explaining, synthesizing, and idealizing” (Weick, 1995, p. 389). In order to contextualize theory in the field of entrepreneurship, Welter (2011) suggests considering situational, geographical as well as temporal boundaries in the process of framing research design. Here it is important to pay attention to the changing context and the resulting influence on setting, actions and behaviours (Welter, 2011).

The defined standard of scientific work is to generate new added value. Therefore, all seven publications were aligned to question old information and explore new aspects. The first three articles provided an overview of the current literature and delivered new, independent definitions of young research areas in two cases. A personal position in a young field of research was set. The interview article could present concrete fields of application and examples, which are interesting for managers and scientists. The last two articles about crowdfunding highlighted very concrete procedures for crowdfunding projects, which are also very interesting for managers and scientists for further research. The empirical articles stand out because they treat the German crowdfunding market, which is almost unexplored. Second, to the best of our knowledge the use of fuzzy set Qualitative Comparative Analysis (fsQCA) in this field is a world first. Third, individual findings are completely new, which allows a solid groundwork for further scientific work and interesting discussions.

4 Results

4.1 Summary of the publications and results

This section presents the results of seven publications included in this thesis. A table shows compactly the summary of the objectives, methods of analysis, research findings, main results and the main contribution of all seven publications. It is followed by a more detailed presentation of the individual articles, with a focus on the overall objective and the main findings. The section is completed by the summary of the overall results. Therefore, the “big picture” of the thesis is drawn and the relationships between the articles are made clearer.

The first article introduces the topic smart city and the novel field of application for entrepreneurial activities. The strong connection between the availability of ITC, big data, open source, the mindset of the citizen and necessary developments for cities and governments are analyzed. The term digital collaboration is introduced with the aim of creating a more liveable environment.

The second article deepens the idea of digital collaboration, with the focus on the new phenomenon shareeconomy. The various forms of shareeconomy are analyzed and the entrepreneurial opportunities are examined more closely. Furthermore, the question of short-term movement or sustainable change is discussed.

The third publication discusses the topic of crowdcreation as a sub-category of crowdsourcing or crowd moving on the Internet. The article analyzes the opportunities for entrepreneurs and established companies to use the wisdom of the crowd for product creation, opinion forming, or voting by anonymous Internet users.

The fourth article develops the entrepreneurial opportunities and challenges in the environment of a smart city in more detail. Concrete experiences of entrepreneurs are discussed and analyzed. The aspect of collaboration through the transformed urban development is part of this article.

The fifth publication included in this thesis also deals with entrepreneurial opportunities and challenges, but in this case in the environment of shareeconomy. Concrete examples are discussed in which the necessity of interaction between several stakeholders is crucial. Even the term “share” suggests togetherness and in this specific case the digital togetherness of the sharing of goods, data and knowledge are examined.

The sixth article introduces the reader to crowdfunding as a sub-category of crowdsourcing. Financing projects with the help of anonymous investors through a crowdfunding platform on the Internet is an alternative way of funding and requires closer inspection. Concrete recommendations for action in order to increase success probability are identified. The interaction and the communication between the project

owner and the crowd are crucial – therefore it is also a co-working or digital collaboration theme.

Finally, the seventh publication adjoins the sixth article. In a different way of statistical calculation, concrete success factors for crowdfunding campaigns are identified and transferred into manager implications.

All presented articles are built on each other, in reference to content and method. Together, the papers form a fundamental basis of research in the field of collaborations in smart city and the area of shareconomy and crowdsourcing. The influence of these novel phenomena on entrepreneurial activity is analyzed and concrete fields of application are identified. The created fundament of this thesis constitutes the discussion base for further analyses, extensions, criticism and support. Since the fields of this thesis are young and therefore mostly unexplored scientifically, the articles can be used in particular for theory-testing as a starting point for further scientific work.

The table below summarizes the research objectives, theoretical perspectives, methods, data, research findings and contributions of the research papers of all seven publications included in this thesis.

4.1.1 Publication 1: The smart city as an opportunity for entrepreneurship

Overall objective

The first article focuses on smart city as a novel concept in urban development, knowledge economy, management and entrepreneurship. The article reviews scientific literature until the date of the publication and provides insights into the fields of application and existing definitions, thereby ensuring the overall understanding of smart city on entrepreneurial activities. Furthermore, digital collaborations are introduced using big data. .

Previous studies have mostly focused on individual aspects of the interdependencies that contribute to the global concept of smart city such as quality of life or human resources. The term smart city is associated with many fields of application and even branches; there is a danger of it becoming a buzzword without a concrete background and a commonly accepted definition of smart city (Allwinkle and Cruickshank, 2011). The article focuses on the six characteristics of a smart city with the concrete focus on entrepreneurial activities.

Main findings

Six characteristics of smart city are identified and analyzed in detail, continuing and expanding the scientific work of Hollands (2008). The availability of ICT infrastructures dominates the concept and will continue to be the central aspect of smart city, together with the willingness to cooperate and work together with foreign citizens,

companies or governments on the base of data exchange (Caragliu et al., 2011). The article provides an independent definition of smart city to contribute to the establishment of a commonly accepted definition in the focus of entrepreneurial activities in the environment of smart city.

The article limits the scope of the topic sharply, focusing mainly on the entrepreneurial activities in a smart city. This approach was novel at the time of publication. Further, this publication provides the basis for the thesis, as all other articles also rotate around the topic of collaborations in the digital new world with a focus on entrepreneurial opportunities and challenges.

4.1.2 Publication 2: The shareconomy as a precursor for digital entrepreneurship business models

Overall objective

The second article examines and discusses another kind of digital collaboration, namely the shareconomy concept. While the concept of sharing is as old as humanity, the economic principle of sharing instead of owning in the context of digital exchange platforms is rather new and emerged in 2013 as a guiding theme for the international and globally leading German high-tech fair CeBIT (CeBIT, 2013). So far, scientific work in this research area mostly dealt with individual aspects of sharing like music or knowledge, or the more global approach of the sharing culture, but did not draw connections to emerging entrepreneurial activities.

The specific connection between the concept of shareconomy and entrepreneurial activities were unexplored at the time of publication. Furthermore, a commonly accepted definition of shareconomy was also missing (Katz et al., 2014), a research gap that this publication intends to fill.

Main findings

The article identifies a trichotomy of shareconomy: sharing digital content, sharing physical content and participation in commercial, cultural or social projects. This approach confirms Kempf's (2013) point of view and is enhanced with additional components.

The article also presents a very sharp definition of shareconomy and subsumes already existing definitions in order to form a single holistic definition of the concept.

The connection between shareconomy and entrepreneurial activity is examined in more depth and practical examples are presented for illustration purposes. Shareconomy is identified as a promising opportunity for entrepreneurs, especially in niche-filling activities.

The study further contributes to research in this field due to the intensive literature review, which offers a holistic overview of scientific publications from recent years. The new definition of shareconomy is the foundation for further development, support or criticism. Yet, a very clear position on the topic is given and the concrete examples offer the opportunity to analyze the development in this field in the upcoming years.

4.1.3 Publication 3: Crowdcreation as a dimension of crowdsourcing: conditions for entrepreneurs

Overall objective

The third article analyzes crowdsourcing with a particular focus on the sub-category crowdcreation. Hence, a third concept of cooperation and collaborations in the digital context is introduced and analyzed. While the overarching phenomenon crowdsourcing was the subject of research of numerous articles and investigations due to its strong connection to globalization and the trend of shifting resources to low-wage countries, the sub-category crowdcreation was almost unexplored at the time of publication.

The aim of the article is to provide an overview of current activities in the field of crowdcreation and illuminate emerging entrepreneurial opportunities and challenges. Especially the advantageous position entrepreneurs are able to enjoy through the crowdcreation concept is highlighted.

Main findings

After a detailed literature review for the main topic crowdsourcing and the identification of three relevant sub-categories (crowdvoting, crowdfunding and crowdcreation), the sub-category crowdcreation is analyzed in more detail, which is linked to the idea of the collaborative knowledge (Geiger and Schader, 2014). Concrete fields of application are presented (generating ideas, adopting micro tasks, design drafting) and then combined with the identified advantages for entrepreneurs. These advantages include access to creativity and high flexibility, just to mention two – and exceed the disadvantages (e.g. potential quality loss or increased transparency of business models and business ideas) significantly.

The study contributes to the young field of academic research in several ways. First, crowdcreation as a separate theme was almost unexplored and this article contributes relevant findings. Second, fields of application could be defined on an individual basis, but have not been regarded in an overall framework. Third, this publication presents an overview of the identified advantages and disadvantages for entrepreneurs using crowdcreation, which were not known of at the time of publication. Fourth, the pure combination of the areas crowdcreation and entrepreneurship is new and adds value to this field of research. In summary, the article offers a basis for further scientific work, especially for future empirical work.

4.1.4 Publication 4: Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany*Overall objective*

The fourth publication offers additional and deeper insights into the first article about smart city. This article builds upon the detailed literature review of the first article and additionally integrates the new findings of in-depth interviews with 12 entrepreneurs. The components smart city, collaboration and entrepreneurial activities are in the focus of this scientific work. Also, the article offers a unique research approach of in-depth interviews with entrepreneurs in the context of smart city that was new at the time of publication.

The aim of the article is to prove the findings and theories in the existing literature with real life experiences of entrepreneurs and expand the findings with so far unknown areas of applications.

Main findings

Six relevant categories of smart city, as defined by Hollands (2008), are discussed in detail, always with a focus on entrepreneurial activities and innovation opportunities. Out of the six characteristics for smart city, four could be confirmed completely (availability and quality of ICT infrastructure and information management, closeness to high-tech and creative industries, the role of social and relational capital, and social and environmental sustainability), whereas the remaining two characteristics could only be confirmed partly (business-led urban development and social inclusion of urban residents in public services). One very interesting and new characteristic emerged from the interviews: the government-led development and support, which has not been a topic in the literature so far but was evaluated as extremely relevant for the success of the novel concept of smart city.

The study contributes to a critical discussion about the added value of smart city in the current state of research. The article provides clearly structured managerial implications in order to improve the current situation and serves as a basis for further empirical research on the themes of smart city, entrepreneurial activities and collaborations.

4.1.5 Publication 5: Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries*Overall objective*

The fifth article expands the existing research in the field of shareconomy. The second publication introduced in this thesis serves as a basis for this article. In fact, the detailed literature review is used as a base for 14 in-depth interviews with entrepreneurs. Similar

to the first four articles in this thesis, the approach of interviewing entrepreneurs in the field of shareconomy was, to the best of our knowledge, unique at the time of publication.

The aims of this article mainly correspond to the aims of the fourth publication: testing theories of the existing literature in the field of shareconomy with experts and real world experiences of entrepreneurs as well as finding unknown components, connections and fields of application in the areas of entrepreneurship, shareconomy and digital collaborations.

Main findings

The literature review highlighted three relevant characteristics of shareconomy: sharing digital content, sharing physical goods and participation in commercial, cultural and social projects. The 14 experts in the field supported the first and the second fields of application, but completely denied the aspect of *participation in commercial, cultural and social projects*. This finding is surprising because several articles about shareconomy only discussed the social movement and the radical change in the era of shareconomy. However, other relevant factors for shareconomy were mentioned in the interviews: customers as providers and consumers (prosumers), mindset, changed living conditions, urbanity, real win-win situation, added value and a trusting business model. These new characteristics, as mentioned by the entrepreneurs in the field of shareconomy, led to a new relevant cascade (or waterfall) in this scientific field: changed living conditions, business model and customer benefit.

Therefore, this publication contributes in several ways to the existing scientific work in the field of shareconomy. First, the existing literature has been tested and applied in a real life business environment. Second, findings conclude that the relevance of one of the most discussed characteristics can be neglected while seven other characteristics of shareconomy could be added. Third, this publication builds the base for further empirical research due to the proof of concepts with in-depth interviews.

4.1.6 Publication 6: Strategies for reward-based crowdfunding campaigns

Overall objective

Whereas the first five publications discussed in this thesis have largely focused on areas that are not yet subject to academic exploration, the sixth article takes a different approach. This publication deals with the subject of crowdfunding under the overall concept of crowdsourcing. This field has been intensively studied since 2013, but primarily based on American data sets coming from American crowdfunding platforms with more than 50,000 data sets (e.g. Kuppuswamy and Bayus, 2014; Mollick, 2014). While previous literature mostly identified individual factors of successful crowdfunding campaigns, this article combines crowdfunding with entrepreneurial

activities and considers the anonymous group of investors for the purpose of co-operation (or digital collaborations).

The particular aim of this publication is the transfer from American crowdfunding platforms to European, or more specifically to German crowdfunding platforms, with a significantly smaller number of data sets. Furthermore, this publication offers an identification of differences in the behaviour of crowdfunding project owners, based on a detailed literature review and the review of several empirical analyses based on American data sets.

This article does not differ in the structure of relevant existing scientific work, but rather differs in the method. The structure is a continuation of work by Mollick (2014), and employs the fuzzy set Qualitative Comparative Analysis (fsQCA), which is very rarely used in the field of crowdfunding and creates scientific added value (Wagemann and Schneider, 2010). fsQCA analyzes the individual components of crowdfunding and determines success combinations, unlike previous research which only considered individual components that increase the success rate of crowdfunding campaigns. The resulting combinations produce concrete managerial implications that are introduced in this publication.

Main findings

This paper is set to introduce a so far almost unused statistical method (fsQCA) to the field of crowdfunding. Three different combinations of success factors for a higher probability of success in crowdfunding campaigns could be identified. Furthermore, the paper offers practical implications for future crowdfunding project owners, based on the derived typology of crowdfunding campaigns. Along the axes of sales effort and project added value, three different terms of crowdfunding project owner were created: communicator, networker and self-runner. These terms are connected to crowdfunding strategies, concrete practical exercises and managerial implications.

Entrepreneurial approaches are discussed according to the specific personality, and the quality of the product and the interaction and communication of entrepreneurs within the crowdfunding community and the social networks are illuminated. Hence, the sixth publication considers the connection aspect of digital collaborations among entrepreneurs and regards this phenomenon from a new perspective.

The contribution to existing literature is fourfold. First, the almost unused method fsQCA is introduced to the field of crowdfunding. Second, concrete managerial implications for entrepreneurs in the field of crowdfunding are given. Third, three different traits of crowdfunder personalities are introduced and deposited with patterns of behaviour. Fourth, this publication builds the base for discussion, support and criticism in future scientific work.

4.1.7 Publication 7: Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs

Overall objective

Similar to the previous article, the seventh publication adds to more scientifically considered areas. Using a data set of a German crowdfunding platform and a more often used statistical method (binary logistic regression analysis), the intensive work and comparison with already existing literature and empirical results is in the foreground. Furthermore, similar to the other articles presented in this thesis, the combination of digital collaboration, here in the specific case of crowdfunding, and entrepreneurial activities is the main focus.

The aim of this article is to identify individual success factors that enhance the probability of success for crowdfunding projects. The focus is put on so far unexplored features or not so often used variables. Lastly, concrete managerial implications for crowdfunding project owners are derived from the findings and presented in this publication.

Main findings

The article could identify eight concrete success factors for crowdfunding campaigns on the basis of a European crowdfunding platform. Some factors are known from existing literature and the dominant US examples could be confirmed in this study; furthermore, some so far almost unexplored factors could be added. Hence, the success factor “teaming up as crowdfunding project owners” and “supporting other crowdfunding projects on certain platforms” are newly added insights. Furthermore, this article offers a newly built categorization of success factors by dividing the eight factors found in two clusters: social factors and framework factors. Concrete practical implications are given and make the article applicable in a business environment.

Moreover, the article offers proof that the personality of the crowdfunding project owner affects the success of the project. Therefore, the presented managerial implications can assist entrepreneurs to perform better in the digital environment. Communication and co-working with other crowdfunding project owners is identified as crucial and underlines the connecting aspect of the thesis: collaborations in a digital world.

The seventh study contributes to the scientific work in several ways. First, the crowdfunding literature is dominated by projects about US crowdfunding platforms and data sets, whereas this article offers a European point of view. Second, the data sets from Kickstarter that previous studies utilize are very large. This article uses a smaller data set and is able to recognize particularities. Third, so far rarely described factors like “teaming up” or “supporting other crowdfunding projects” is part of the work, due to the high time investment and intensive work of the authors with the existing literature

and the data. Therefore, new aspects could be added to the broad field of crowdfunding literature. Fourth, two clusters of success factors could be introduced, social and framework factors, offering a new differentiation to the best knowledge of the author. Last, this article offers an opportunity for further scientific work, discussions, criticism and support.

The following table summarizes the main findings.

Table 6: Main findings of the publications

Publication title	Objective	Research method and data	Main results (Excerpt)
Publication 1: The Smart City as an Opportunity for Entrepreneurs	To provide basic knowledge of the young research field of smart city and identify potential entrepreneurial activities for further research	Literature review	<ul style="list-style-type: none"> • Confirmation of six characteristics of smart city • Creation of a definition of smart city with the focus on entrepreneurial activities • Greatly sharpening the research field for future work
Publication 2: The Shareconomy as a Precursor for Digital Entrepreneurship Business Models	To generate background knowledge of the shareconomy and identify potential entrepreneurial activities for further research	Literature review	<ul style="list-style-type: none"> • Identification of a trichotomy of shareconomy, confirming existing literature • Creation of a definition of shareconomy with a more holistic approach • Introducing entrepreneurial activities in the field of shareconomy
Publication 3: Crowdcreation as a Dimension of Crowdsourcing:	To produce background knowledge of crowdsourcing in	Literature review	<ul style="list-style-type: none"> • Analysis of the little explored sub-category crowdcreation

Conditions for Entrepreneurs	general and crowdcreation in a more detailed approach		<ul style="list-style-type: none"> • Identification of concrete entrepreneurial fields of application • Presentation of advantages and disadvantages for entrepreneurs using crowdcreation
Publication 4: Innovating and exploiting entrepreneurial opportunities in a Smart City: Evidence from Germany	To analyze the real world experiences of entrepreneurs from the field of smart city and compare them with the existing literature	Qualitative study; in-depth interviews; 12 entrepreneurs from Germany, Austria, Switzerland	<ul style="list-style-type: none"> • Real world experiences of entrepreneurs • Confirmation of six characteristics of smart city and finding one little explored field of application • Presentation of concrete managerial implication
Publication 5: Innovative Business Models for the Shareconomy: An Exploratory Study of 14 Entrepreneurs from the German-speaking Countries	To analyze the real world experiences of entrepreneurs from the field of shareconomy and compare them with the existing literature	Qualitative study; in-depth interviews; 14 entrepreneurs from Germany, Austria, Switzerland	<ul style="list-style-type: none"> • Real world experiences of entrepreneurs • Confirmation of relevant characteristics, refuting one of the most discussed arguments • Introduction of a waterfall model for relevant characteristics for further research
Publication 6: Strategies for reward-based crowdfunding campaigns	To compare crowdfunding campaigns and identify options for entrepreneurs which are success factors through a	fuzzy set/Qualitative Comparative Analysis (SPSS), 446 data sets from a German crowdfunding	<ul style="list-style-type: none"> • Identification of little-explored combination of success factors for crowdfunding campaigns • Introduction of three

	combination of platform features		types of crowdfunder • Concrete managerial implications
Publication 7: Directing the wisdom of the crowd: Key success factors	To identify options for entrepreneurs to optimize the crowdfunding campaigns and increase the probability of success for their future campaigns	Binary logistic regression analysis (SPSS), 432 data sets from a German crowdfunding platform	<ul style="list-style-type: none"> • Confirmation of numerous success factors of existing literature • Identification of little-explored, new success factors • Introduction of a new cluster for success factors: social and framework aspects

5 Conclusion

5.1 Introduction

Tackling the quote in the first lines of this thesis in the introduction chapter, which calls digitalization the most powerful change since the industrial revolution (Arthur, 2011), this thesis can partly support massive changes in the field of digital collaborations with the focus on entrepreneurial opportunities in the areas of smart city, shareconomy and crowdsourcing. The aim of this thesis was to extend the scientific knowledge in these fields, and was dominated by two research objectives:

First, reviewing existing literature in the fields of smart city, shareconomy and crowdsourcing with a focus on entrepreneurial opportunities.

Second, generating empirical data to prove the existing literature, confirm or reject existing hypotheses and build our own insights.

The thesis tackles the first research objective by providing a theoretical contribution to the existing scientific work in the fields of smart city, shareconomy and crowdsourcing in general. Also, the novel and additional added value aspects are the strong connection between the themes smart city (publication 1), shareconomy (publication 2) and crowdsourcing (publication 3) on the one hand and the aspects of entrepreneurial opportunities on the other. The first three publications are detailed literature reviews and are considered as fundamental basis work. They also provide a core for the second research objective, which asks for the generation of empirical data.

The thesis addresses the second research objective by collecting insights of real world experiences. The study generates context-specific findings in different ways. It starts with in-depth interviews with entrepreneurs about business opportunities, opportunities and risks from the fields of smart city (publication 4) and shareconomy (publication 5). It is followed by the quantitative approach of figuring out success factors for entrepreneurs in crowdfunding campaigns. Once combinations of factors for successful projects are identified (publication 6), concrete success factors for crowdfunding campaigns of entrepreneurs are analyzed (publication 7). This thesis contributes to the entrepreneurship literature by building a better understanding of entrepreneurial opportunities in the fields of digital collaboration in the areas of smart city, shareconomy and crowdsourcing.

5.2 Results

Considering the central research question of this thesis (“Are there business opportunities for SMEs in the fields of smart city, shareconomy and crowdsourcing, and what specific fields of application and recommendations of implementation are to be identified (especially in the countries of Germany, Austria and Switzerland)?”), it can

be stated that every single publication addresses this research question and delivers meaningful insights.

Picking up the rough framework of this thesis, it can be stated that the four major goals could be achieved.

The link between smart city, shareconomy and crowdsourcing could be confirmed. Conditions in these fields of research could be described and limitations, advantages and concrete fields of application could be identified. Finally, success factors and managerial implications could be delivered, which are highlighted in the results and in a short summary in this section. Figure 4 symbolizes the successful research work.

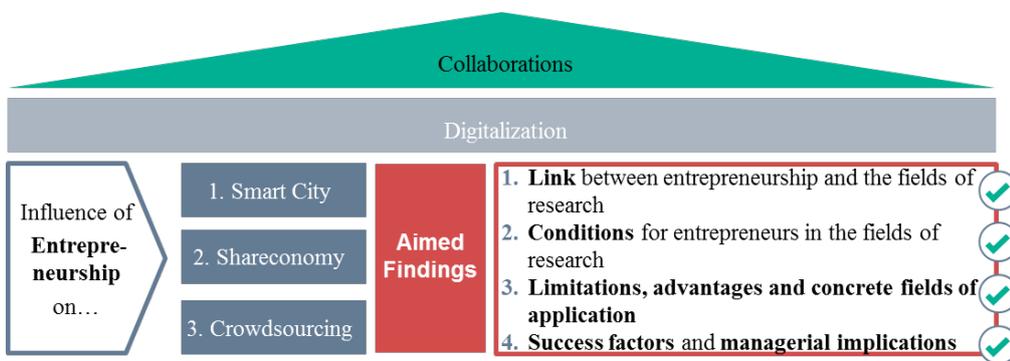


Figure 4: Achieved findings in this PhD thesis

The more concrete research questions within the seven publications are also mentioned in this section and confirm the strict answering of the research questions.

Publication 1 about smart city found the strong relationship between the concept of smart city and entrepreneurial activities or entrepreneurial marketing. The favourable conditions and characteristics of smart city like availability and quality of ICT infrastructure and usage, business-led urban development or high-tech and creative industries are a breeding ground for entrepreneurial opportunities and niches. Six relevant fields of application were analyzed and the publication highlights the opportunity for entrepreneurs and calls for a detailed analysis of these concrete fields of application in future research.

Publication 2 explored the research question “What are the connections between the up-and-coming field of shareconomy and entrepreneurship?”. First, the general base for entrepreneurial opportunities could be confirmed through the innovative, niche-filling activities in an environment of changing consumption behaviour from owning and now leading to sharing and renting. The sharing of digital and physical goods including concrete examples from real world experiences could be confirmed as business opportunities for entrepreneurs. A strong future consumer base and the possibility of

reducing individual consumption by sharing will open even more new opportunities for sustainability-driven entrepreneurship. Therefore another unexplored link to green entrepreneurship is also confirmed.

Publication 3 about crowdsourcing investigates the research question “What are the conditions for entrepreneurs using crowdsourcing in general and crowdcreation in particular?”. The publication can offer several concrete conditions for entrepreneurs in the field of crowdsourcing and crowdcreation. Crowdsourcing means the transfer of tasks to an anonymous crowd via the Internet. Crowdcreation is a sub-division and treats the creation of ideas, products and services through the crowd. Advantages (like access to greater creativity and innovations, external resources, high flexibility, market research and market testing) are offset by disadvantages (like loss of quality control, threat of ideas being copied through the crowd, more complex cost calculation). A consideration of these advantages and risks is important for entrepreneurship, but publication 3 recommends the usage of crowdsourcing for entrepreneurs due to their lack of resources and competences, which is commonly accepted as one of the greatest limitations for small and medium-sized businesses.

Through the first three publications, the first part of the superordinate research question can be confirmed positively: there are strong business opportunities for SMEs in the fields of smart city, shareconomy and crowdsourcing. The following four publications investigate more deeply the concrete fields of application for entrepreneurial opportunities.

Publication 4 about the real world experiences of entrepreneurs in smart city deals with the concrete fields of application and entrepreneurial opportunities (“To what extent do the six characteristics of smart city apply to the real world experiences, what other factors are of importance, and what are the interconnections between the identified factors?”). The current lack of a responsible player and a clear vision of smart city dominates the insights and represents an unexplored factor in the existing research. Four aspects of smart city which dominated the existing literature so far could be confirmed by our experts: availability and quality of ICT infrastructure and information management, closeness to high-tech and creative industries, role of social and relational capital, and social and environmental sustainability. Two main aspects in the existing literature could not completely find support from the experts: business-led urban development and the social inclusion of urban residents in public services. The publication offers several recommendations for further development in the environment of smart city: on the one hand hard factors like technological solutions, and on the other hand soft factors like cluster building, attracting further entrepreneurs or offerings subsidies.

Publication 5, with interviews of entrepreneurs in the field of shareconomy about their real world experiences and entrepreneurial opportunities, offers concrete insights into the so far unexplored research field (“Which factors of shareconomy are really relevant for entrepreneurs?”). Nine aspects could be identified, which are clustered into three

main topics by the authors: business model (including the factors sharing of digital content, sharing of physical content and customers as providers and consumers (prosumers)), changed living conditions (including mindset, changed living conditions and urbanity) and customer benefit (including real win-win situations, added value and a trusting business model). This trichotomy is a result of 14 interviews and serves as a basis for further research in the future.

Publication 6 is about crowdfunding and tries to answer the research question: “What makes crowdfunding successful? Which combinations of key success factors of crowdfunding are relevant?”. The data set of a German crowdfunding platform offers three different success paths for crowdfunding campaigns. Under consideration of the multi-layered options of crowdfunding campaigns, the deduction of three paths is very helpful and offers the option for further research in the future. Path 1 is the combination of the number of supporters and backers and the number of comments. Path 2 asks for the number of supporters and backers, updates and blog entries and rewards/incentives, but avoids additional web presence. Path 3 contains the same aspects, but in a different order: it asks for additional web presence, number of supporters and backers, updates and blog entries but avoids rewards/incentives. Strict application of these results increases the probability of a successful crowdfunding campaign significantly.

Publication 7 also deals with crowdfunding, but in this case the individual success factors for entrepreneurs during crowdfunding campaigns (“Which individual aspects of factors for crowdfunding projects ensure the success of crowdfunding campaigns?”). Eight different aspects could be identified, which partly support the existing literature, and partly represent new insights. The factors “funding as a team” and “supporting other projects on the specific crowdfunding platform” are unexplored features to the best knowledge of the author. An interesting aspect of the paper is the table “change in probability of successful (non-successful) funding”, which offers a statistically supported probability of success for crowdfunding campaigns for every single factor.

The seven publications included in this thesis offer a very concrete picture of entrepreneurial opportunities in the fields of smart city, shareconomy and crowdsourcing. The existence of entrepreneurial opportunities could be confirmed and concrete fields of application could be identified in detail. Partly, the developed results are completely new for this field of research and form the basis for further research. The research question could be answered in every single publication and therefore contributes to the overall picture and allowed us to gain deep knowledge. The following visualization presents the goal of the thesis and the developed findings.

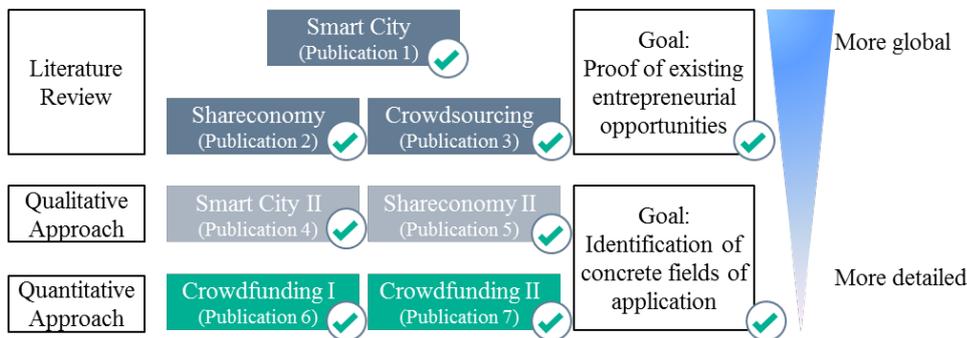


Figure 5: Research design and achieved goals

5.3 Theoretical contribution of the study

The findings of this thesis contribute to the scientific work on entrepreneurship in the fields of smart city, shareconomy and crowdsourcing. The work includes theoretical, empirical and methodological findings or unexplored areas, which are presented below.

First, after the basic work and the intense comparing with the existing literature, two completely independent definitions of the so far very broad and partly unstructured fields of smart city (publication 1) and shareconomy (publication 2) could be presented. Therefore, the research areas of smart city and shareconomy are now sharply limited for future research. Already existing literature and definitions are newly compounded and present more generally accepted definitions. The combination of basic work of literature reviews and the link to entrepreneurial opportunities is an important theoretical contributions.

Second, the publication about crowdsourcing and the sub-category crowdcreation (publication 3) underlines the necessity of a deeper theoretical analysis in this field. Crowdcreation as a separate theme was almost unexplored and was not analyzed in a holistic approach. A confrontation of advantages and disadvantages for entrepreneurs using crowdcreation was a new approach, which was not known at the time of publication. Another aspect is the pure combination of crowdcreation and entrepreneurship, which also had not been done in the past. Therefore the article offers a strong theoretical base for further research.

Third, the used method of the in-depth interviews with entrepreneurs in the field of smart city (publication 4) and shareconomy (publication 5) are the first empirical analyses in this field, to the best knowledge of the author. Relationships between the fields of smart city and shareconomy as well as entrepreneurial opportunities, opportunities, threats, confirmation of existing literature and gaining so far unexplored aspects contributes strongly to these very young fields of research.

Fourth, the publications about crowdfunding (publications 6 and 7) developed several so far unexplored features for successful crowdfunding campaigns through the empirical approach. These empirical results offer the opportunity for further research in this field, confirmation and refutation of the gained insights and a strong basis for discussion.

Fifth, one so far not used method in the field of crowdcreation demonstrates the novel approach of this thesis (publication 6, fuzzy set Qualitative Comparative Analysis). The fuzzy set qualitative comparative analysis offers several traits for successful crowdfunding campaigns. Therefore the selection of this method offers methodological novelties and therefore contributes strongly to future research.

Sixth, publication 7 compares the crowdfunding results of Germany, Austria and Switzerland with the dominating US market and delivers besides the regional comparison also so far not explored crowdfunding success factors. This is attributed to the strong manual work on the data set, which leads to a strong empirical contribution.

Summarizing the result section, this thesis makes a deep contribution to the young research field due to the listed insights. Partly, the base work for further research is built through this work and underlines the high level of new insights and innovations.

5.4 Limitations and suggestions for future research

The author of this thesis is aware of limitations in his work, which is very likely in a PhD thesis and especially in a very young field of research.

The first point which is to be mentioned is the fact that this work is focused on entrepreneurial opportunities in the fields of smart city, shareconomy and crowdsourcing. Deep technical, social, psychological or even more global analyses are not part of this work. Therefore, these fields of research strongly contribute to the field of entrepreneurship, but do not offer a holistic approach.

Second, the definitions in the fields of smart city and shareconomy were defined in 2014 and with the best knowledge of the author. The literature and the research in these fields develop rapidly, so it is possible that smart adaptations are already necessary.

Third, the empirical work in the fields of smart city and shareconomy are limited to in-depth interviews due to the young field of research and the lack of established or even easily recognizable companies in this field. Therefore, a larger number of interviews or even the opportunities of quantitative analysis were not available at the time of publication. These opportunities could strongly underline the gained insights of this work, which is also mentioned in the section on future research. More empirical work would be helpful to strengthen the newly established definitions as well. In a broader approach, the empirical work in different settings can discover more entrepreneurial

opportunities in the investigated fields of research. The fields of research are strongly heterogeneous, therefore a deeper base with sets of data are greatly welcomed.

Fourth, the in-depth interviews took place in Germany, Austria and Switzerland. The results are characterized by European countries, all respected and well-organized, economically stable and open for innovation. Therefore, the insights of this PhD thesis present an extract of the global development in the fields of smart city and shareconomy.

Fifth, the data for publications 6 and 7 come from a German crowdsourcing platform whose users are mostly German-speaking. Therefore, the results present an extract of the German crowdfunding market and the behaviour of German entrepreneurs, which can be understood as an approximation, but not as a global character. The identified differences between the German crowdfunding platform and the well-recognized US crowdfunding platform could be continued and deepened in particular ways.

Sixth, the generated data sets are strongly limited in context of quantity. Therefore, this work can be regarded as a snapshot and excerpt with meaningful insights, but further research with a higher quantity is absolutely necessary. The conducted qualitative studies are related to validity and reliability limitations due to the fact of almost impossible replication of the interviews.

Seventh, the thesis worked in the field of success factors and could identify concrete factors to improve entrepreneurial orientation. The academic theory of success factors is highly controversial, some researchers even deny the relevance of single factors. This critical opposite is not worked out in this thesis in depth and could be continued and deepened in particular ways.

5.5 Policy and managerial implications

This thesis provides several managerial and policy implications besides the strong theoretical contribution to the field of research.

The central aspect in the research about smart city is the lack of the leading position in the construct. Who is responsible in a city for further development, engaging the citizens to participate, motivating companies to support this movement? A concrete answer in the in-depth interviews could not be found because the predestined player, the city council, could not fulfil the expectations of the entrepreneurs. The urgent need for well-qualified staff in the municipal administrations is an outstanding result of this work. The concept of urban development is supported by the country, so the interplay between the city, the county and state has to be redefined. Clear responsibilities are necessary to lead the development from day one to avoid the loss of common goal alignment and taking advantage of bureaucratic clearances by large enterprises with high capital investments. Clear rules are needed at an early stage in order to stop the

fear of the residents of foreign rules by innovative companies (e.g. Google, Apple) and the handling of sensitive personal data.

Another very interesting aspect is the need for qualified staff in municipal and regional banks under control of the city, county or state. Investments in companies out of the fields of smart cities, shareconomy or crowdcreation are not comparable with classical investments in small and medium-sized enterprises like hairdressers, shops or car dealerships. Investments in young online companies are more abstract, more risky and partly not able to be documented in a serious business plan. Therefore, the chances of entrepreneurs in the fields of smart city, shareconomy or crowdsourcing obtaining a loan are very limited due to the lack of online skills among bank employees.

Third, the expected growth of the shareconomy movement asks for stronger regulations in terms of taxes and regulations for business models in this online field (e.g. shareconomy alternatives for cab services or room rentals). Otherwise, the negative impression of bypassing existing taxes and regulation in the “real world” should be limited by the government. This means that the responsibilities start immediately with the issues and raise profound laws and taxes.

Fourth, the idea of a social motivation for entrepreneurs in the environment of shareconomy is rejected (Publication 5); only the pure idea of monetizing an idea is the driving force. This aspect is crucial to note for further investments from governments. Shareconomy users are interested in social, urban and cultural ideas and development, but the entrepreneurs behind the business models are not interested in this. This small but crucial difference should be considered in questions of subsidies.

Having considered the policy implications, we now turn to the managerial implications.

First, the term “smart city” is negatively associated through inflationary usage and the very broad field of applications plus the lack of a commonly accepted definition. Therefore, entrepreneurs should be aware of labelling their business and their idea with the term “smart city” solely without having a fundamental business model in this field of business. Using the term frequently could be interpreted negatively because the content is still unclear for the broad public.

Second, crowdsourcing and crowdcreation offers a broad field of positive influences. The central aspect of the concept is the interaction with the crowd and therefore with potential customers. This access to clients is crucial for product and services development, feedback routines and ideas collection. One central aspect of failure of young companies is the implementation of an idea without considering the real needs and wishes of the potential customers. The very banal sounding key point, that the customer is at the centre of the business model, is a very rarely used one. Crowdsourcing offers an opportunity to prove the business concept at an early stage.

Third, in the first publication about crowdfunding (publication 6) the authors identified three different types of project owner: the communicator, the networker and the self-runner. The classification is underlaid with the two factors required sales effort and project added value as components for a successful crowdfunding campaign. Entrepreneurs have to be self-reflected and self-conscious to categorize themselves into one of the three types of project owner. The communication strategy and needed sales effort are derived, so very concrete instructions have been found. Five practical guidelines for future project owners could be identified: 1) Start creating new projects with the simple goal of generating added value for third parties, not for the project owner. 2) Start discussing the idea at a very early stage with your close peer group in an effort to identify market demand and optimize the project. 3) Keep the desire for continuous development, for example with the help of sample through-runs, fixed feedback routines, pre-testing, or re-designing the project if needed. 4) Start the communication with family, friends and colleagues early – they are crucial for the first stage of the campaign and therefore for the degree of attention to the whole project. 5) Create constant updates about optimization, news, innovation, experiences and feedback.

Fourth, the second publication about crowdsourcing offers additional success factors for crowdfunding campaigns. Eight very concrete success factors could be found and serve as highly recommended instructions in the future. They are divided into two clusters: social aspects and framework. Social aspects consist of five factors: a) supporting other projects on the platform, b) funding as a group not as a single person, c) supporting social projects, d) using Facebook in addition to keep the crowd informed and e) generating comments and replies to comments to attract the crowd. The framework aspects are as follows: a) setting small funding goals, b) setting up short project durations and c) offering rewards.

Summarizing the section on policy and managerial implications, it can be stated that several theoretical but also very practical recommendations could be identified in this work. Therefore, this work contributes strongly to the field of research due to the delivered base for further discussions and partly the first mover marking.

This thesis is a contribution to the very young discussion and analysis in the research of smart city, shareconomy and crowdsourcing with the focus on entrepreneurial opportunities through digital collaboration. Future work should shine light on several topics, especially contributing stronger empirical work to support the chain of reasoning with a greater amount of data. In the field of smart city the lack of a central leading position should be investigated more deeply along with the opportunities to expand the idea in rural areas to lift the quality of life and to avoid an even stronger cut between the city and the rural areas. The central question for shareconomy should be the next development stage of sharing in the digital world, and which aspects are entrepreneurial opportunities without purely copying existing business models. The same point applies for crowdsourcing. Summarizing, a stronger conceptual base for further research is

needed based on empirical data from several countries to strengthen the relevance of realignments.

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Publication I

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The Smart City as an opportunity for entrepreneurship

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Abstract: The topic of Smart Cities as an approach for sustainable urban development with the application of ICT has become an intensely discussed field in the recent past. The notion of the term is inconsistent, and the label of a *Smart City* is misapplied by a growing number of cities. In this article, the authors define the decisive six characteristics of a Smart City by taking the relevant literature into account. They furthermore identify a research gap between the Smart City and entrepreneurship as one main characteristic of the concept. The focus on this topic is justified by a strong influence of the six characteristics of a Smart City on entrepreneurial activities. The further need for research on the interdependency of these two fields, as well as subareas (e.g., entrepreneurial marketing), concludes this paper.

Keywords: Smart City; entrepreneurship; definitions; small- and medium-sized enterprise; SME; opportunities; digital entrepreneurship.

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1 Introduction

The current world population living in cities has never been higher, and continues to steadily increase (Bakici et al., 2013; Caragliu et al., 2011). In 1950, 30% of the total world population lived in cities. This figure rose massively to 50% in 2011 and is forecasted to increase up to almost 70% by 2050 [United Nations, (2012), p.4]. This megatrend of urbanisation is global. Of note is how it impacts less developed regions more than industrialised ones. Urban development can be considered as a given (Kourtit et al., 2012) that is initiated by urbanisation. Governments need to identify ways to navigate this development in a sustainable direction (Bakici et al., 2013; Cardone et al., 2013).

In addition, information and communication technologies (ICT) have changed the possibilities for cities to organise urban growth (Bakici et al., 2013; Lombardi et al., 2012; Schaffers et al., 2011; Tranos and Gertner, 2012). ICT have a “profound transformative effect on people, businesses, and communities” in the present [Eger, (2009), p.48]. As a consequence of both urbanisation and the digital revolution, the interest in the Smart City concept has grown immensely within the last two decades (Tranos and Gertner, 2012). Governments and policymakers design economic policies for their cities that are based on high-tech infrastructures, with the overall goal of establishing a framework for the constantly growing cities of the future. The inhabitants of a city also make an effort in this direction as they seek a high(er) quality of life in the cities of the future (Bakici et al., 2013; Thite, 2011).

The Smart City represents an interdisciplinary field of research as it combines approaches of spatial planning (Chapin, 2012), economic geography (Bunnell and Coe, 2001), knowledge economy (Zygiaris, 2013), urban technology (Allwinkle and Cruickshank, 2011; Caragliu et al., 2011; Schaffers et al., 2012) as well as marketing (Doel and Hubbard, 2002). These studies concentrate on individual elements and their interdependencies that contribute to a Smart City such as human resources or the quality of life. Despite these inroads, academic research on the Smart City is at an early stage. Although definitions are multitudinous, they lack a homogenous basic understanding of what a Smart City is. In any case, the competitiveness of a city today is determined by its innovativeness and economic strength. Even smaller cities that are presently growing have the chance to reposition themselves by establishing and implementing an ICT infrastructure. In the process of this, more and more business locations are created, contributing to a higher entrepreneurial activity in a Smart City when compared to other

cities (Bakici et al., 2013; Doel and Hubbard, 2002). While researchers have realised that Smart Cities are more entrepreneurial than others (Lombardi et al., 2012; Tranos and Gertner, 2012), an analysis of the individual characteristics accounting for this higher entrepreneurial activity within Smart Cities has not been conducted.

This paper aims to close this specific research gap between entrepreneurship and the Smart City. It represents a detailed literature review on the emerging topic of the Smart City in a structured analysis of the current state of research.

The following is based on a comprehensive literature analysis of papers on the topic of the Smart City published in leading journals from 2000 to 2013. Since the Smart City is an interdisciplinary approach, business and management journals were taken into account along with works on communications, urban technology, human resources and regional sciences. Additional studies cited by these works are incorporated into this article. A database search using the University of Leicester Online Library, Web of Knowledge (Thomson Reuters), and EBSCO [EconLit, Business Source Premier, Academic Search Premier, Science Direct, Emerald Management Xtra, and the Web of Science (Social Sciences Citation Index)] located usable texts. The selected journals were identified based on certain key words (including *Smart City* and *entrepreneurship*) in their titles and/or abstracts.

As mentioned, the topic of the Smart City is in an early stage of academic research. Hollands (2008) was the first to critically discuss the characteristics of a Smart City in detail. In combination with continuative studies, his work will show key results. Using a systematic literature review approach by Tranfield et al. (2003), the studies will be classified according to their validity and what they have to offer to the scientific discipline.

This paper is structured as follows: First, the strongly differing definitions of a Smart City are presented. To concretise the understanding of a Smart City in the literature, six characteristics of a Smart City are specified in an attempt to achieve a kind of synthesis (Caragliu et al., 2011; Hollands, 2008; Lombardi et al., 2012). These characteristics are then analysed with regard to their contribution to the entrepreneurial activity within a Smart City.

2 Definitions of the Smart City

This chapter addresses the definition of Smart Cities. As the approach is in an emerging status of (scientific) attention, the application of the term Smart City is inconsistent (Lombardi et al., 2012; Tranos and Gertner, 2012). In other words, it is (still) a ‘fuzzy concept’ [Caragliu et al., (2011), p.67]. Hollands (2008, p.303) points out that there is no omnipresently accepted definition, identifying a ‘lack of definitorial precision’. Cities currently do their best to exploit this deficit by self-defining themselves as a Smart City (Caragliu et al., 2011; Hollands, 2008; Tranos and Gertner, 2012). Our attempt will be to achieve a consistent definition by taking the most relevant definitions into consideration, which are listed in Table 1.

Table 1 Definitions of a Smart City

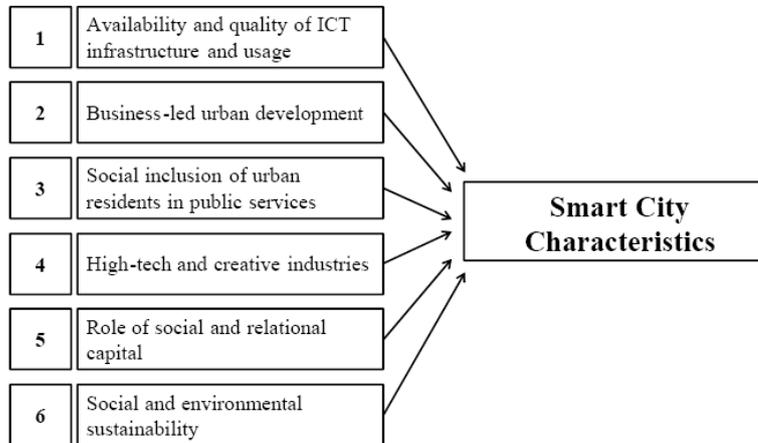
<i>Authors</i>	<i>Smart City</i>
Hall (2000, p.1)	“The vision of ‘Smart Cities’ is the urban center of the future, made safe, secure environmentally green and efficient because all structure – whether for power, water, transportation, etc. are designed constructed, and maintained making use of advanced, integrated materials, sensors, electronics, and networks which are interfaced with computerized systems [...]”
Komninos (2006, p.6)	“Territories with high capacity for learning and innovation, which is built in the creativity of their population, their institutions of knowledge creation, and their digital infrastructure for communication and knowledge management.”
Giffinger et al. (2007, p.11)	“Smart City is a city well performing in a forward-looking way in these six characteristics (a smart economy; smart mobility; a smart environment; smart people; smart living; and, finally, smart governance), built on the ‘smart’ combination of endowments and activities of self-decisive, independent and aware citizens.”
Hollands (2008, p.308)	“[...] utilization of networked infrastructure to improve economic and political efficiency and enable social, cultural and urban development.”
Caragliu et al. (2011, p.70)	“We believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.”
Lombardi et al. (2012, p.138)	“Smart Cities in terms of their dual roles as generators of intellectual capital, creators of wealth and regulators of standards (university, industry, civil society and government), as well as supporting the social learning and knowledge-transfer abilities that are needed to meet the requirements of their regional innovation systems.”
Bakici et al. (2013, p.136)	“Briefly, a Smart City should be able to actively generate smart ideas in an open environment through fostering clusters or open data or developing proper living labs while directly involving citizens in the co-creation process of products or services.”

For this study, we suggest a combination of the most applied definitions in the recent literature: “A Smart City is an agglomerated area affected by a high concentration of learning and innovation as a result of creative citizens and institutions as well as the implementation of a digital infrastructure with the overall objective of achieving economic growth and a high quality of life, while keeping in mind the scarcity of natural resources” (Caragliu et al., 2011; Giffinger et al., 2007; Hollands, 2008; Komninos, 2006).

3 Synthesis

The high variety and heterogeneity of approaches and their definitions of a Smart City makes it necessary to create a homogenous basic understanding.

In his article ‘Will the real Smart city please stand up?’, Hollands (2008, p.307) criticised the ‘self-congratulatory’ label of a Smart City, analysing various characteristics as an approach towards a more concrete concept (Allwinkle and Cruickshank, 2011). Figure 1 shows the six characteristics at a glance.

Figure 1 The six characteristics of a Smart City

Further specifications of these characteristics have been made by different researchers. They include:

- 1 The *availability and quality of ICT infrastructure and usage* is considered to be the most basic characteristic (Bakici et al., 2013; Caragliu et al., 2011; Hollands, 2008; Komninos, 2002; Thite, 2011; Tranos and Gertner, 2012). A Smart City necessarily has to have “a rich environment of broadband networks that support digital applications” [Schaffers et al., (2011), p.435]. In a Smart City, ICT should be inserted to increase the government’s and economy’s efficiency as well as to contribute to social, cultural and urban growth (Caragliu et al., 2011; Hollands, 2008; Komninos, 2006). ICT infrastructure comprises mobile and landline phones, and internet services (with inter- and intra-city digital networks) (Tranos and Gertner, 2012) and helps to provide services for business (e-commerce), governments (e-governance), lifestyle, housing and leisure (Caragliu et al., 2011). Additionally, ICT infrastructure such as smart grids and smart meters are associated with a Smart City. A smart grid is a power and distribution system for sustainable energy, being ‘smart’ in terms of reliability and eco-friendliness as it supplies citizens with services as well as efficient energy management applications while combining advantages in comparison to existing grids. It is intelligent, efficient, accommodating, reliable, and secure, all while reducing global warming and featuring automatic system maintenance with a consumer focus that aims at energy usage customised towards individual needs. Smart meters will be integrated into smart grids for monitoring the energy consumption of private households and businesses. The data will then be channelled into the information network and smart grid platform (Chen, 2010; Shafiullah et al., 2013). Information is also guided from sensors in the cities into a communal data centre. Necessary adjustments or changes a city may require are inferred from the evaluation of data. Sensors are distributed throughout the cities, and their data evaluation and management is performed by universities (Chan et al., 2008). This new form of digitalisation optimises traffic, rubbish disposal, and regional marketing activities (Lombardi et al., 2012) thanks to this data stream evaluation. Traffic is controlled with the help of a navigation system

– alternative routes are calculated and thus ensure a free flow of traffic. Getting the local population to participate via their mobile applications (e.g., by reporting road damage, overflowing rubbish bins, and broken lights) leads to considerable cost savings for the city. The availability of data can therefore be achieved with different applications resulting from the ICT infrastructure within a Smart City. Cloud services within city-based clouds also contribute to an increasing data availability (Schaffers et al., 2011). “Stable sturdy infrastructures, from optical fibre networks covering the city acting as a backbone to the installation of sensors, are the key for the development of intelligent solutions for cities” [Bakici et al., (2013), p.140]. There are two primary information sources within an ICT infrastructure and usage: Information flows coming from sensors, elements, and open data (information provided by the public sector) within the city; and information flows from the city’s inhabitants in the form of social media or crowd sourcing (Bakici et al., 2013).

So high ICT availability and quality points out the leading idea of a Smart City to generate development, growth and prosperity (Caragliu et al., 2011).

- 2 *Business-led urban development* is emphasised as a Smart City characteristic (Hollands, 2008). A slight transformation in the urban governance from a managerial to an entrepreneurial focus can be observed, particularly in Western cities (Harvey, 1989; Quilley, 2000). The influence of corporations in various sizes is rising steadily (Gottdiener, 2001; Klein, 2000; Monbiot, 2000), and this observation can be applied to Smart Cities. After all, there is a decisive need for businesses in a Smart City: Public investments are often too marginal to be effective for a cost-intensive smart urban growth. Companies representing private capital markets are needed to supply the city with a sufficient amount of money. These companies comprise small- and medium-sized enterprises (SMEs) as well as large corporations. To attract them, the local government has to provide advantageous conditions for businesses (Hollands, 2008). Even though the dependence of the local government on the private sector as well as public-private partnerships can be affected by barriers and disputes, the high influence of business within a Smart City in terms of cooperation is often positively emphasised (Harvey, 2000).

The need for constant private capital should make the Smart City attractive for new businesses and what they mean for a smart economy. This is based on the idea of a Smart City offering an innovative spirit, which is particularly important for entrepreneurship (Tranos and Gertner, 2012), making a Smart City an entrepreneurial city which provides new business opportunities (Jessop and Sum, 2000). The above-mentioned transparent access to data results in many “entrepreneurial activities and a constant flow of new firm creation” [Lombardi et al., (2012), p.148]. These cities “are increasingly functioning as seedbeds for creativeness, innovation [and] entrepreneurship” [Kourtit et al., (2012), p.230].

These first two characteristics are essential for a city in order to be regarded as smart (Tranos and Gertner, 2012).

- 3 The *social inclusion of urban residents in public services* via e-governance is essential for a Smart City. Governmental services should be provided to all urban residents, citizens, businesses and employees via ICT (Caragliu et al., 2011; Hollands, 2008). This can be achieved with the integration of ICT in municipal

services, resulting in improved government efficiency that includes citizens in public services, and makes a government's open data accessible (Bakici et al., 2013). Thanks to the work of Hollands (2008) Southampton can be considered the first 'real' Smart City in how it created a portal for smart card applications to be applied in public transport, recreation and leisure activities. This smart card software is a prominent example of giving the citizens access to public as well as a few private services. Here, services can be added as well as removed, depending on the user's individual choices (Allwinkle and Cruickshank, 2011). Looking at this example, it becomes clear that the usefulness of an application or e-service is important in achieving a high social inclusion (Schaffers et al., 2011).

- 4 The *role of high-tech and creative industries* contributing to urban growth is pointed out as another characteristic of a Smart City (Hollands, 2008). The focus of this point is on human and social dimensions rather than on the 'hard infrastructure' of business-led urban development. In particular, the 'soft infrastructure' in terms of knowledge networks and the presence of a creative class (in the form of a highly skilled workforce in creative industries) accounts immensely for sustainable economic and urban growth (Florida, 2002; Winters, 2011). Thus, a Smart City needs to attract creative and highly skilled human resources in order to be able to achieve this goal (Nijkamp, 2008).

The *smart community* is closely connected to this rather human dimension of a Smart City (Eger, 2009; Hollands, 2008). ICT enables people to exchange information rapidly and form closer relationships independent of time and geographical distance (Eger, 2009). "[...]Cities offer important socio-economic and cultural advantages that are far higher than any other settlement pattern" [Kourtiti et al., (2012), p.231]. The availability of a highly skilled labour force is high, particularly in a Smart City, and knowledge spillovers are likely to occur. And the geographical agglomeration of knowledge activities increases knowledge transfer and spillover effects (Kourtiti et al., 2012). This aspect is increasingly important for the transfer of tacit knowledge. Codified knowledge such as stock prices can easily be transferred from one person or location to another. Tacit knowledge is often bound to one person, and the codification is complex. Here, its spread only occurs via the personal contact of the knowledge providers (Bolisani and Scarso, 2000). "Tacit knowledge is transferred through observation, interactive participation, and practice" [Kourtiti et al., (2012), p.232]. Put more simply, high availability in a Smart City is highly valued. Additionally, the productivity of knowledge workers rises in these kinds of concentrated environments (Florida, 2002).

- 5 Hollands (2008) identifies the *role of social and relational capital* as another important Smart City element. The community within a Smart City has to learn, adapt and constantly innovate (Coe et al., 2001). Citizens, economies and governments have to be able to use ICT in order to achieve a benefit from its implementation. Whenever social and relational capital is ignored by a city, social polarisation (leading to economic polarisation) can be a negative outcome (Caragliu et al., 2011). Florida (2002) understands these cities as learning regions in which individual and collaborative learning processes take place within networks. These learning processes contribute to urban development because the information exchange of actors within a Smart City is high (Kourtiti et al., 2012).

- 6 The last characteristic of a Smart City involves *social and environmental sustainability*. The economic and urban growth of a Smart City needs to properly take the scarcity of resources into account. With their high concentration of citizens, the use of resources and production of waste is immensely high in Smart Cities (Gleeson and Low, 2000). The cautious and renewable use of natural resources limits the dimension of both urban and economic growth (Caragliu et al., 2011). In addition, new business opportunities for modern transport technologies emerge with a focus on increasing the efficiency of urban traffic and the mobility of an urban population (Lombardi et al., 2012). Whatever the case may be, the need for sustainable solutions is high. Innovations like smart grids, smart software or smart traffic systems contribute to the environmental sustainability in a Smart City (Nathan, 2013; Sen et al., 2012; Shafiullah et al., 2013; Sivaram et al., 2013). In order to achieve this goal of sustainability, it is necessary that local governments “undertake initiatives and strategies that create the physical-digital environment of Smart Cities, actualising useful applications and e-services” [Schaffers et al., (2011), p.435].

Leaving the ‘hard infrastructure’ of ICT as a main requirement aside for a moment (Schaffers et al., 2011), all of the formulated characteristics effectuate *business-led urban development*. “A strong pro-business/entrepreneurial state ethos” [Hollands, (2008), p.309] is a main concern of a Smart City in addition to its new technologies. Cities “develop competitive advantage based on their ability to mobilise the best people, resources and capabilities required to turn innovations into new business ideas and commercial products” [Thite, (2011), p.624]. Studies have proven that technology and innovations allow communities to have an especially high impact on economic and urban growth (Stolarick and Florida, 2006; Wojan et al., 2007).

As a consequence, local governments and corporative actors have focused on the implementation of the idea of a Smart City – especially in European countries (Thite, 2011). The European Union releases an annual ranking of cities based on six different fields of research: smart economy, smart mobility, smart governance, smart environment, smart living, and smart people (Smart Cities, 2013). These dimensions are related to traditional regional and neoclassical approaches to urban growth (Lombardi et al., 2012). They also represent the main characteristics referred to above: economic growth, transport and ICT economics, governmental services, natural resources, quality of life, and human capital (Giffinger et al., 2007; Lombardi et al., 2012). Since there is no consistent understanding of a Smart City, manifold terms exist for its classification (Lombardi et al., 2012). An alternative formulation is offered by four policy prototypes of a city: connected city (ICT usage and mobility), entrepreneurial city (economic growth), liveable city (careful use of scarce resources), and pioneer city (social capital) (Nijkamp and Kourtik, 2011). The terms safe, secure, environmental and efficient are also used in connection with a Smart City (Bakici et al., 2013; Caragliu et al., 2011; Giffinger et al., 2007; Komminos, 2006).

Once the digital revolution created the necessary circumstances for the implementation of a Smart City, the literature concerning this topic began to develop (Bakici et al., 2013). Because sustainable economic growth resulting in urban growth is the main indicator for a city as being smart, the question on how to achieve this growth has been analysed in various ways. Studies focusing on the analysis of the presence of highly skilled human resources (Shapiro, 2005; Thite, 2011; Winters, 2011),

transportation systems (Xiong et al., 2012), ICT infrastructure (Chen, 2010; Hancke et al., 2013; Nathan, 2013; Pirisi et al., 2012; Sarfi et al., 2011; Shafiullah et al., 2013; Sivaram et al., 2013; Zhu et al., 2013), and applications and services (Calderoni et al., 2012; Schaffers et al., 2012; Vilajosana et al., 2013; Walravens, 2012) have been published. Case studies for European Smart Cities in general (Caragliu et al., 2011) as well as on Barcelona (Bakici et al., 2013), Helsinki (Hielkema and Hongisto, 2013) and Seoul, San Francisco and Amsterdam (Lee and Hancock, 2012) have been conducted. In spite of this, the field of entrepreneurship as a main contributor to the economic growth of a Smart City has been left largely uncovered. Researchers favourably note how Smart Cities attract companies and entrepreneurs (Bakici et al., 2013). Sauer (2012) evaluates the question of smart entrepreneurs and how they concern community innovations as an outcome of Smart Cities in general. Still, the thesis of Smart Cities offering attractive circumstances for new businesses still awaits empirical proof. What the literature names as the most important circumstances and motivations for entrepreneurs in a Smart City will be analysed in the following.

4 Entrepreneurship in a Smart City

With the deficit in the studies of the connection between high entrepreneurial activity and its specific characteristics now identified, this chapter aims to solidify this connection. The six characteristics discussed above will be analysed in terms of how they contribute to entrepreneurship in a Smart City.

The criteria for a Smart City's entrepreneurial attractiveness have been specified by different researchers. It has gained additional prominence with the attention of international media, researchers from different research fields, and the economic activity of large ICT corporations. Thus, Smart Cities offer a forward-looking possibility for economic activities. The 'innovative spirit' [Tranos and Gertner, (2012), p.177] as a feature of Smart Cities can lead to new business activities and entrepreneurship. Hollands (2008, p.303) sums it up in how he calls Smart Cities a "high-tech variation of the 'Entrepreneurial City'".

"Smart Cities have a high productivity as they have a relatively high share of highly educated people, knowledge-intensive jobs, output-oriented planning systems, creative activities and sustainability oriented initiatives" [Kourtit et al., (2012), p.232]. The six main characteristics discussed above also comprise additional criteria for the Smart City as a centre of entrepreneurship (Bakici et al., 2013).

- 1 Since the *availability and quality of ICT infrastructure and usage* is high in Smart Cities (Kourtit et al., 2012), they offer a high quality hard infrastructure and availability of databases (Schaffers et al., 2011). The growing businesses of creative industries and digital media are strongly attracted and fostered by a high quality of ICT infrastructure (Hollands, 2008). The data (referred to as 'big data') results in new business opportunities. This data needs to be prepared and the required information extracted for further use. It can then be provided to companies, institutions (see point 3. above: e-governance) or citizens via new applications. Large corporations already seek to exploit these opportunities (IBM, 2013; T-Systems, 2013). Big data is a new field of science which allows the discovery of knowledge that so far has yet to be fully discovered (Fan and Bifet, 2012). These two companies

(IBM and T-Systems) provide the consolidation of data, including the memory (storage) and the basis for future common use (open data) (Komninos, 2006). The technical aspect of Smart Cities, the required technologies, and the resulting business opportunities for SMEs could include sensors technologies, mobile phone usage (mobile P2P), or grid technology (Munir et al., 2007).

- 2 The *business-led urban development* connected with the Smart City being an entrepreneurial city (Jessop and Sum, 2000) implies the presence of a high amount of entrepreneurs. Therefore, Smart Cities offer a 'socio-technical network' [Sauer, (2012), p.63] among entrepreneurs with possible knowledge spillovers as a side effect, contributing to the innovative spirit of the city.

At the same time, governments depend on the private sector to ensure the "long term sustainability of Smart Cities through viable business models" [Schaffers et al., (2011), p.435]. Therefore, entrepreneurs and their economic activity are likely to be promoted by the government.

Smart Cities are comparable to the classical cluster developments in urban planning. Similarly structured companies attract each other, and industries occur that frequently have a number of aspects in common. It should basically be noted that similar-minded workers look for similar local conditions. In the case of Smart Cities, this is in the form of a proximity to institutions of higher education such as universities and to companies working in the same field (compare Yigitcanlar et al., 2008). This option of urban growth must be actively managed by cities. Therefore, clusters are often governmentally promoted (through, e.g., tax breaks) as they secure stronger economic power and increased productivity for the region or the city. The cluster development itself intensified by governmental promotion contributes to the attractiveness of a Smart City for entrepreneurs. Business opportunities for various industries rise as the number of companies located in a Smart City increases. In practice, this point is emphasised by clusters such as those found in Silicon Valley (USA), a global forerunner for entrepreneurial concentration (Stam and Garnsey, 2007).

This accumulation of active participants is described as a 'regional innovation system' [Holbrook and Wolfe, (2005), p.111] which fits into the picture of networking in Smart Cities within urban development. Innovative networks form the core of newly founded Smart Cities. The collective exchange to the specific field of Smart Cities changes the traditional urban planning and development. So-called 'localised knowledge spillovers (LKS)' [Caragliu et al., (2011), p.173] support the adoption that the accumulation of peers lead to higher work productivity and wages (Rosenthal and Strange, 2008).

- 3 The characteristic of *social inclusion of urban residents in public services* represents a demand and therefore strong business opportunities for new applications to be used for e-governance. Also, the interest of citizen policymakers in "concrete and short-term solutions, benefiting business creation, stimulation of SMEs" [Schaffers et al., (2011), p.433] emphasises a support of entrepreneurial activity.

The important status of local governments within the concept of a Smart City are emphasised, as they work as promoters for entrepreneurship within urban areas by offering public-private partnerships as well as knowledge transfer by the presence of

institutions of higher education (Holbrook and Wolfe, 2002). The interaction of the four factors 'public-private-people-partnership' [Schaffers et al., (2011), p.433] underlines the high relevance of public involvement. The interaction between the inhabitants of a Smart City, the city itself, and the associated businesses is characterised by the willingness of changes, own involvement, pride in innovation and a stronger sense of local patriotism (Evers, 2013).

This generates further business opportunities for mobile application and further research, both of which ensure a larger market and an increased use (Bakici et al., 2013). The involvement of citizens is absolutely essential when it comes to entrepreneurship and social contribution, because public institutions partially (or fully) lack expertise or resources. Companies as well as entrepreneurs benefit from subsidies and the corresponding infrastructure. So a strong contribution of the social inclusion of residents towards entrepreneurial attractiveness of a Smart City is (putting it mildly) a must.

- 4 *High-tech and creative industries* in the form of highly skilled human resources are an economic factor for new and established businesses. Florida (2002) states that the availability to highly skilled and creative work forces is as important for the economy today as the access to coal and iron was to steel making during the industrial revolution. With the idea of providing citizens of a Smart City a high quality of life in mind, access to highly skilled human resources is above average in Smart Cities (Winters, 2011). As already seen under characteristic 2, the building of clusters plays a major role. Creative approaches are attracted to each other, which can be seen in the capital of the internet and ICT. Examples like Silicon Valley (USA) or regional start-up cities like Berlin (Germany), London and Cambridge (UK), Helsinki (Finland), Stockholm (Sweden) and Paris (France) underline this point. Tolerance, technology, and talent are the main drivers of economic development (Florida, 2002). In addition, the 'triple helix approach', which applies the three elements of university, industry and government (Lombardi et al., 2012) to a knowledge-based innovation system is regarded as further supporting economic growth in cities. Smart Cities fit in this environment, as high-tech and creative industries are mostly knowledge-intensive. Therefore, innovation systems are likely to occur in a Smart City, which is supported by the classical diffusion theory. Rogers (1962) states that innovators are young, well-educated, open-minded people, being attracted to a location by places such as universities as part of the triple helix approach. With a high concentration of potential innovators, tacit knowledge (Kourtit et al., 2012) plays a key role. The concentrated flow of unwritten rules and procedures provides a unique location and attractiveness factor to entrepreneurs in a Smart City. "Knowledge-creating networks depend upon the transmission of ideas and tacit knowledge. This is best done through regular face-to-face contact" [Leadbeater, (1999), p.144].

Smart Cities are also linked with the term 'living labs', a modern research concept to validate innovations through the four main activities of co-creation, exploration, experimentation, and evaluation (Schaffers et al., 2011). 'Living labs' are also achieved through a concentrated collection of well-educated entrepreneurs in a small regional area (Sauer, 2012). Concrete examples of this include the Amsterdam

Living Lab or the Rotterdam Climate Campus (Netherlands), both with the goal of strengthening the position of the Netherlands when it comes to innovation.

- 5 The *role of social and relational capital* is important for the determination of new business opportunities. The demand for new applications is high. Developed applications require the availability of a potential user market to be found in Smart Cities (Schaffers et al., 2011).

Aspect 5 is strongly supported by the aspects discussed above. Due to a concentration of new businesses in a certain area, investors are present and the exchange between the stakeholders is supported by spatial and contextual proximity.

- 6 With the growing realisation of the scarcity of resources in a population (particularly an urban one), the characteristic of *social and environmental sustainability* (Kourtit et al., 2012) of Smart Cities becomes an increasingly important economic factor, offering economic opportunities for businesses (Bakici et al., 2013).

Pollution is a major threat to cities and urban areas, expanding upon the overall issue of environmental pollution (air and water pollution, global warming, ozone layer depletion, etc.) that engages citizens and governments. The so-called ‘green movement’ is here a very relevant issue which Smart Cities can contribute towards. Applications which monitor the flow of traffic and that regulate traffic lights are an example of solving issues with smart, green ideas created by entrepreneurs. The self-motivation to be part of any kind of sustainable improvement is an issue for business/entrepreneurs in Smart Cities.

After consideration of the six aspects of Smart Cities and their possibilities, concrete approaches, and examples for entrepreneurs, it’s clear that Smart Cities need to be much more associated with entrepreneurship. The correlations between these two are intense. There is a need for a new niche in the broad field of entrepreneurship for Smart Cities (and vice versa).

Considering the extensive options in Smart Cities for start-ups or SMEs, it is very important, and now possible, to take the next step of expanding upon the existing definition of Smart Cities for entrepreneurship: “A Smart City is an agglomerated area affected by a high concentration of learning, entrepreneurship and innovation as a result of creative citizens and institutions as well as the implementation of a digital infrastructure with the overall objective to achieve economic growth and a high quality of life, all while keeping in mind the scarcity of natural resources” (Caragliu et al., 2011; Giffinger et al., 2007; Hollands, 2008; Komninos, 2006).

Considering the strong interdependencies between the fields of the Smart City and entrepreneurship, continued research will without question be needed. A Smart City is a place with a high social inclusion of its inhabitants, is attractive to a young and well-educated workforce, and has an intense focus on sustainability. So further studies analysing the Smart City concept through the lens of social, green and youth entrepreneurship will be necessary.

Taking the results of the previous analysis into consideration, a further connection of Smart Cities to the field of entrepreneurial marketing can additionally be identified. The high popularity of the Smart City, referred to as the ‘economic image’ [Tranos and Gertner, (2012), p.177], results in favourable conditions for entrepreneurial marketing because it can be used as a marketing instrument by entrepreneurs. This image represents

“an essential ingredient of place (City) promotion [...] to provide knowledge-rich entrepreneurs with living, work and play space” [Doel and Hubbard, (2002), p.360]. So an idea for future research would be an analysis of the connection between Smart Cities and entrepreneurial marketing.

5 Conclusions

The international megatrends of digitalisation and urbanisation have led to a growing interest in the Smart City concept in recent years. Since the Smart City combines approaches from various research fields, the diversity of definitions results in a non-homogenous understanding of the term. Hollands (2008) was the first to criticise the inflationary self-labelling of cities as ‘smart’ due to the high attention paid to the topic, analysing six different characteristics that a city has to feature in order to receive the ‘smart’ label. These are: the availability and quality of ICT infrastructure and usage; business-led urban development; social inclusion of urban residents in public services; high-tech and creative industries; social and relational capital; as well as social and environmental sustainability, of which the ICT infrastructure can be regarded as a main requirement with the focus on business-led urban development.

Many authors note the advantageous properties of a Smart City for entrepreneurship. What remains to be discussed is which attributes in particular contribute to the entrepreneurial activity in a Smart City, and to what extent. This study analysed which attributes are particularly relevant or supportive factors for entrepreneurship in a Smart City. As a result, a strong connection between the fields of the Smart City concept and entrepreneurship could be identified. The six characteristics of a Smart City highly contribute to entrepreneurial activity.

Subsequent to this study, additional need for further research could already be recognised, e.g., the presence of different fields of entrepreneurs (social, green, and youth entrepreneurship) in a Smart City. The favourable conditions offered by a Smart City towards entrepreneurial marketing represent opportunities for additional studies. Furthermore, future studies should consider the influence of Smart Cities on changes, i.e., in population numbers, per capita salary, and the unemployment rate.

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Publication II

Richter, C., Kraus, S., and Syrjä, P.
**The shareconomy as a precursor for digital
entrepreneurship business models**

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The shareconomy as a precursor for digital entrepreneurship business models

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Abstract: Shareconomy is a budding field of science and deals with the new movement of sharing goods with others instead of buying them. The three dimensions of shareconomy are sharing of digital content; sharing of physical goods; and the participation in commercial, cultural, and social projects. So far, the connection between the up-and-coming field of shareconomy and entrepreneurship has not been scientifically proven. This paper aims to remedy this research gap. Its content is based on a comprehensive literature analysis of scientific publications on the topic of shareconomy from the period 2000 to 2014 and delivers a new definition, concrete application examples, and recommendations for future implementation by entrepreneurs. Shareconomy is a future science field with the potential to change the behaviour of consumption, and therefore requires extensive further research.

Keywords: shareconomy; definitions; smart cities; digital entrepreneur; digital; entrepreneurship.

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1 Introduction

The idea of *sharing* as an efficient and essential tool to move beyond individual limits received initial attention with publications on ecological thinking such as *Limits to Growth* by Meadows et al. (1972). The idea of sharing is developing rapidly thanks to the continuing process of digitisation and increased transparency through the internet. Business ideas in this field are also present, including the concept of how sharing represents a ‘counter-intuitive’ [Grassmuck, (2012), p.18] approach to *homo economicus*, which depicts humans as acting economically rational and competitive. Authors like Hardin (1968) discussed sharing as disadvantageous for the achievement of objectives because a sharing individual loses his advantage to the competition. Weitzman (1984, p.1) was the first to analyse sharing from an economic perspective, regarding it as a way for ‘conquering stagflation’ (p.1) in market economies.

Today, economies in varying states of development share their resources and therefore can profit from one another via growing global linkages (Gold, 2004). The circumstances for sharing have changed fundamentally since the start of its discussion in the 1980s. Sharing is today regarded as an outcome of “the digital revolution, from Web 2.0, from social networks, from the generation of ‘digital natives’” [Grassmuck, (2012), p.18]. Digitalisation enables the unlimited copying of digital data or objects without any material costs or loss of quality, and with only a minimum of effort (Unger, 2012). At the same time, the saturation of the markets with digital equipment continues to rise steadily (Stalder, 2009). The possibilities of communication have therefore been transformed and affect its behaviour as a result (Castells, 2009). Following the principle “What’s mine is yours”, more and more people share personal information, data, goods, knowledge etc. (Botsman and Rogers, 2011). Entire industries have reacted to this principle such as the mobility industry with its ‘Car2Go’, the chemical industry with offering products at a

monthly fee and even the energy industry charging a monthly fee to consumers for the use of thermal heat (Schiederig and Herstatt, 2014). The value of property is decreasing (Rifkin, 2007), while the willingness to share it is growing (Kempf, 2013). According to Forbes, the profit created through shareconomy (also referred to as Share Economy or Sharing Economy) projects were more than US\$3.5 billion in 2013, with an annual growth of up to 25% projected for 2014 (Gerom, 2013).

Scientific publications are in most instances concerned with the culture of sharing (see Stalder, 2005; Grassmuck, 2012; Unger, 2012; Sützl, 2013) or single shared goods such as knowledge (Zhaoli and Jiong, 2009), music (David, 2010), or resources (Gold, 2004). This article seeks to explore the economic, profit-gaining perspective of sharing whose emergence is a recent phenomenon: the shareconomy (Mühl, 2013), a concept that to date remains for the most part scientifically unfathomed. The international attention paid to economy-based sharing activities is nevertheless high, as seen with various online publications (see Dierig, 2013; Fournier et al., 2013; Gerom, 2013; Hank and Von Petersdorff, 2013; Lomoth, 2013; Mühl, 2013; Unknown, 2013). The renowned and globally-leading German high-tech fair CeBIT announced shareconomy as its guiding theme for 2013 with a focus on solutions for both corporations and entrepreneurs (CeBIT, 2013; Sützl, 2013). Since shareconomy offers distinct advantages for entrepreneurship as an instrument to overcome barriers of limited resources, various online publications for entrepreneurs and start-ups strongly focus on this topic and discuss newly-founded examples within it (Fournier et al., 2013; Gerom, 2013; Rãth, 2013). And in fact, the German shareconomy landscape is dominated by start-ups (Rãth, 2013). The economy of sharing fosters new business models, while at the same time questioning existing ones, especially those found at large corporations (Kempf, 2013). Gerom (2013, p.1) refers to shareconomy as “an economic revolution that is quietly turning millions of people into part-time entrepreneurs [...]”.

So far the connection between the up-and-coming field of shareconomy and entrepreneurship has not been academically investigated in detail. This paper aims to close this research gap. It represents a detailed literature review of the emerging shareconomy using a structured analysis of the current state of research.

The content of this paper is based on a comprehensive literature analysis of scientific publications on resulting from an extensive database search.

This paper is structured as follows: First, the existing definitions of the term shareconomy are presented as a theoretical basis for further remarks. To concretise the understanding of shareconomy in the existing literature, its characteristics are specified along with concrete application areas as a synthesis. These are then analysed with regard to an adequacy and applicability of shareconomy for entrepreneurs.

2 Methodology

The methodological approach of this paper comprises a comprehensive literature review of several academic publications on shareconomy. Whereas the idea of sharing has been established for a long period of time, the concept of shareconomy is a rather new phenomenon. Therefore, only the most recent scientific works were chosen to construct the basis of this paper. In fact, mainly publications from the period 2000 to 2014 were reviewed because one major dimension of shareconomy, the sharing of digital content, has emerged with the rise and increasing popularity of the internet. Since the concept of

sharing is an interdisciplinary approach, business and management publications were taken into account, along with works on communications, culture, and human resources. Additional studies cited by these works are incorporated into this article. A database search using the University of Leicester Online Library, Web of Knowledge (Thomson Reuters), and EBSCO [EconLit, Business Source Premier, Academic Search Premier, Science Direct, Emerald Management Xtra, and the Web of Science (Social Sciences Citation Index)] resulted in usable texts. The average number of results from the database search amounts to 180. The amount of scientific publications on the topic is minor, which is assumingly due to the recency of the topic. Therefore, Google search results have additionally been included to offer a more extensive theoretical foundation. After the systematic literature review approach by Tranfield et al. (2003_ENREF_70), the selected publications were identified based on certain key words (including shareconomy, sharing economy, and entrepreneurship) in their titles and/or abstracts. The decision of whether content qualified to be included was based upon inclusion and exclusion criteria specified during the research phase. In fact, studies were classified according to their validity and what they have to offer to the scientific discipline.

3 Definitions

Weitzman (1984) was the first to coin sharing in an economy as a positive, to-be-aspired-for attribute, stating that in 'share economy' traditional labour contracts are replaced with more unusual contracts, leading to higher profits gained by each individual in a shareconomy, and improving employment. Still, he did not concisely define the term. Romani and Tondini (2005) noted that despite criticism of Weitzman's ideas about the share economy and its assertions and applications, there is no doubt about the originality and innovative potential of his model. However, there is no clear understanding of sharing itself, such as the parts of a sharing process or what people understand it to be when they use the term sharing (John, 2013). This section will therefore provide an overview of the few existing definitions. As the issue of shareconomy continues to boom (Grassmuck, 2012), corporate actors and authors attach their ideas to it. Shareconomy is consistently used in this article in line with the CeBIT (2013) and publications (Kempf and Pörschmann, 2012; BITKOM, 2013; Kempf, 2013) connected to it. Terms such as peer economy, collaborative economy or collaborative consumption are often not clearly distinguished from shareconomy, indicating a lack of a consistent definition (Botsman, 2013). In order to analyse shareconomy on an explicit basis, we will aim to achieve a consistent definition by taking the most relevant ones into consideration. These are listed in Table 1.

These definitions provide several insights. First, Recke (2008) was the pioneer who defined the term for the conference next09 with a general focus. The remaining definitions were stated in 2013, making shareconomy a very young and unexplored topic. Second, the existing definitions are not the product of scientific publications, so no scientific definitions of the term exist. Third, the definitions use differing terms such as share economy (Recke, 2008; Gerom, 2013; Kempf, 2013) or sharing economy (Bendel, n.d.; Botsman, 2013; Rouse, 2013; Silver, 2013). Fourth, the definitions differ strongly in their focuses. For example, Recke (2008) concentrates on the enabler of a shareconomy, Botsman (2013) refers to an economic model, while Kempf (2013) focuses on the dimensions of the term. Fifth, the authors disagree on the relation of shareconomy to

collaborative consumption. Botsman (2013) distinguishes clearly between these two terms in her publication, while Rouse (2013) and Bendel (n.d.) equalise them.

Table 1 Selected definitions of shareconomy

<i>Authors</i>	<i>Shareconomy</i>
Recke (2008, n.p.)	“The internet has generated an independent economy of sharing. Because sharing is economic intelligence: The more we let others participate in our success, the more we profit ourselves. The economic theorist Martin Weitzman used the term Share Economy for this”.
Botsman (2013, n.p.)	“An economic model based on sharing underutilized assets from spaces to skills to stuff for monetary or non-monetary benefits. It is currently largely talked about in relation to P2P marketplaces but equal opportunity lies in the B2C models”.
Gerom (2013, p. 2)	“[...] Share Economy, where asset owners use digital clearinghouses to capitalize the unused capacity of things they already have, and consumers rent from their peers rather than rent or buy from a company”.
Kempf (2013, p.1)	“ShareEconomy has three core dimensions: The sharing of digital content, the sharing of physical goods, and the participation in commercial, cultural and social projects. Enablers of this trend are modern technologies which are being provided by the ICT sector: internet, smartphones, cloud services, localization functions etc.”.
Rouse (2013, n.p.)	“Sharing economy, also known as collaborative consumption, is a trending business concept that highlights the ability (and perhaps the preference) for individuals to rent or borrow goods rather than buy and own them”.
Silver (2013, n.p.)	“[...] The sharing economy [...] is perhaps best defined as a way of sweating underutilised assets, by building communities around them and turning consumers into providers [...]”.
Bendel (n.d., n.p.)	“The term Sharing Economy refers to the systematic lending/borrowing of objects and mutual provision of rooms and spaces, especially through private individuals and stakeholders. The main focus is on collaborative consumption”.

We present the following definition which is based on those listed above: *shareconomy is an economic model enabled by modern ICT, based on the sharing of digital content, physical goods, or the participation in commercial, cultural or social projects to access underutilized assets for monetary or non-monetary benefits*. In this article, we seek to examine shareconomy and its application by entrepreneurs, making the focus of the following analysis on monetary benefits only.

4 Synthesis

Being in an infancy state of scientific research, a homogenous basic understanding of the approach towards shareconomy is needed. While a classification in different areas of activity that reflect different outcomes might be an intuitive set-up, the academic literature on shareconomy does not explicitly mention a respective classification. Therefore, we propose dimensions as descriptions of features of shareconomy. In fact the three dimensions of shareconomy:

- 1 sharing of digital content
- 2 sharing of physical goods
- 3 participation in commercial, cultural and social projects are the foundation of this chapter and are shown in Figure 1.

They are the product of remarks by Kempf (2013) during the CeBIT 2013. Different detailed approaches to shareconomy do not exist. Each dimension will be discussed in detail with real-world examples in the following.

Figure 1 Dimensions of shareconomy

Dimensions of Shareconomy	
1	Sharing of digital contents
2	Sharing of physical goods
3	Participation in commercial, cultural and social projects

4.1 *Sharing of digital content*

Digital content includes products or information items whose representation can be entirely digitally recorded and whose transfer is not attached to a physical medium (Shapiro and Varian, 1998; Seidenfaden, 2006). It is therefore “everything that can be digitized” [Shapiro and Varian, (1998), p.3] such as electronic books, software, music or film data (Brandtweiner, 2000). Being intangible, the reproduction or convertibility of digital content can be done with minor effort. Its simple reproduction process leads to the advantages of economies of scale. Creation costs, referred to as ‘first copy costs’ [see Shapiro and Varian, (1998), p.5; Brandtweiner, (2000), p.146] are only high when producing the content. Marginal costs for reproduction are low, especially when compared to physical goods. A fixed cost degression is the result. This effect is strengthened by low investments for the creation of digital content, as new production plants would otherwise have to be built for physical goods. Also, there is almost no capacity limit for digital content, which might require new investments e.g., when production plants for physical goods are enlarged. The convertibility of digital content represents the economic opportunity to extend the regular product life cycle by constantly adapting the content to the needs of the consumers, acquiring new markets as a result. Digital content is more durable than physical goods, as its use does not lead to an actual physical abrasion, and the product quality does not decrease with an increasing number of consumers (Seidenfaden, 2006). One disadvantage with digital content is the control of the copyright as a protection of its creator, comprised as digital rights management. This is a challenging topic that is intensely discussed (e.g., by the music industry) (David, 2010).

The sharing of digital content is regarded as the dimension which initiated the trend of shareconomy. This of course occurred at the same time as the growing success of the social web (Kempf, 2013). Social networks have eased the process of sharing digital content, and today, every internet user can be a creator of it (Mullan, 2011). In addition, mobile clouds (Katz et al., 2014) blogs, platforms, commenting features in online media,

or the evaluation functions of e-commerce provide a variety of possibilities to share. “The virtually unlimited capacity of the internet to store past events is both a blessing and a hazard for online interactions to which human relations must adjust” [Etemad et al., (2010), p.336]. The growing dispersion of media for mobile internet usage such as smart phones is regarded as a catalyser for this development (Hargittai and Walejko, 2008). Today, 83% of German internet users share digital content according to a representative survey by BITKOM (2013); 97% of these users are between the ages of 14 to 29. Still, the main purpose of sharing digital content is currently private and personal with the sharing of self-made pictures (44%), personal experiences with products or services (44%), or links to texts (34%) [Kempf and Pörschmann, (2012), p.2]. The first dimension of shareconomy can comprise C2C (e.g., sharing of self-made pictures on social networks) or C2B (e.g., evaluation of products or services from one consumer to another) business models (Kempf, 2013). As this article focuses on the economic applicability of shareconomy dimensions for entrepreneurs, we concentrate on the analysis of B2B or B2C business models with the aim of monetary benefits. German internet users prefer legal file sharing services (16%). According to the BITKOM (2013) survey, service platforms for the sharing of digital content have more users than providers of the sharing of physical goods or the participation in commercial, cultural or social projects. Two examples of filesharing will be analysed in the following.

- a Dropbox is a cloud storage solution for companies (B2B) and private consumers (B2C) (Carney, 2013). It was founded in 2007 by Drew Houston and Arash Ferdowsi, two MIT students who were looking for a way to share data and work on it on different terminals without having to send it by e-mail (Dropbox, 2013). Dropbox offers three different versions. The basic applications are available free of charge for up to two gigabytes of storage space (Dropbox Free). A charge is required for more storage space. In 2011, Dropbox had 50 million users (with 4% of these being paying customers) and 70 employees. With no increase in users in 2012, Dropbox sales still doubled (Barret, 2011). In 2013, Dropbox had 200 million users worldwide and 4 million companies as customers. With recommendation functions, the number of users is constantly growing (Dropbox, 2013). The company is valued at US\$8 billion (MacMillan and Ante, 2013) with 2011 sales of US\$46 million. This number rose to US\$115 million in 2012 and was estimated to increase to US\$200 million in 2013.
- b The sharehoster Megaupload was founded in 2005 as a platform for different digital content. Files such as movies were uploaded by users (B2B and B2C) and downloaded by others. Megaupload had 180 million users with 350 million accesses on average each day. The platform could be used without charge. A fee had to be paid for a premium account for faster and more downloading. These fees and advertisements generated total sales of nearly US\$175 million for the company. In 2012, the platform was closed due to various copyright infringements: users had uploaded first-run films which were then downloaded by others, a procedure regarded as a criminal act (Brinkmann, 2012).

4.2 *Sharing of physical goods*

Physical goods are tangible (Senior, 1863). They are objects for which a demand exists. Ownership rights can be claimed whose characteristics are obtained over elapsed time,

and their existence is autonomous from their owner. They are exchangeable and tradable on markets and their production requires specialised knowledge (Parry et al., 2011). The production of physical goods requires investments in production plants and investments when production capacities are expanded. The reproduction costs are higher compared to digital content but decrease with increasing production amounts. The convertibility of physical products requires both creation effort as well as an adaption of the production process. Physical goods are destructible and their product quality declines over time (Seidenfaden, 2006).

The second dimension of shareconomy, the sharing of physical goods, is increasing in acceptance by consumers and is therefore increasing in importance for this economic model. The physical good shareconomy includes bikes, cars, and accommodations. Consumers seek to share underutilised goods with others and are able to generate monetary profits and contribute to a sustainable use of limited resources (Kempf and Pörschmann, 2012). 85% of German internet users would at some point agree to share their physical goods, and 52% believe the physical dimension of the shareconomy will be increasingly important (Kempf, 2013). According to the survey, sharing platforms for bikes (9%), products (9%), cars (3%), and apartments for tourists (2%) lead this category (Kempf and Pörschmann, 2012). Great potential is seen for the future with car sharing and couch surfing in particular because modern ICT services offer a constant availability of these kinds of physical goods, as well as real-time billing depending/based on the period of usage. Two examples of use are presented below.

- a Airbnb is regarded as the best known example of shareconomy (Gerom, 2013). The company considers itself a collaborative marketplace where individuals can advertise, locate, and book accommodations worldwide. Founded in 2008 by Brian Chesky, Joe Gebbia, and Nathan Blecharczyk, it today offers more than 500,000 advertisements worldwide with more than 9 million total guests in 34,000 cities and 192 countries (Airbnb, 2013). Airbnb provides the infrastructure between guest and host as it processes a booking. The business model offers B2B (e.g., employees rent an apartment during a business trip) and B2C (e.g., tourists) solutions. At the same time, the platform works as a mediator for C2C (e.g., private apartment rental to tourists) and C2B (e.g., private apartment rental for business purposes) relations. Airbnb receives payments for the booking from the guest by credit card. The host is then paid by Airbnb 24 hours after the arrival of the guest to ensure the quality of the accommodation shown on the website. Airbnb charges service fees between 6 to 12% of the booking amount from the guest and an additional 3% from the host (Airbnb, 2012). Airbnb revenues are estimated to have reached US\$1 billion in 2013 (Thomas, 2013).
- b SmartBike DC was introduced in 2008 as the first bike sharing system in North America in Washington, DC. The network represented a public-private partnership between the District of Columbia and the advertising company clear channel (Silverman, 2008). Due to a low and stagnating number of users, the system was taken out of service in 2011 (Rosiak, 2010). These kinds of bike sharing systems offer solutions primarily for consumers (B2C) and for businesses (B2B) as well (see e.g., Deutsche Bahn, 2010).

4.3 *Participation in commercial, cultural and social projects*

The third dimension of shareconomy refers to the financial contribution to commercial, cultural, or social projects via crowdfunding on one hand, and crowdfinancing for young companies on the other (BITKOM, 2013). Crowdfunding and crowdfinancing are closely connected to the concept of crowdsourcing, in which certain tasks are outsourced to a group of people as an open request, usually via online platforms (Howe, 2006). Crowdfunding is based on the idea of an external financing of a project by involving the public. Instead of having to attract a small group of investors to finance a project, each individual in a crowd contributes a minor amount of money (Belleflamme et al., 2011). There are no essential requirements the initiator of the project has to fulfil (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). He simply has to promote his idea by asking the crowd for a contribution (Pelzer et al., 2012). The amount of contributed investments via crowdfunding is currently rising. According to the Crowdfunding Industry Report, US\$2.7 billion were collected in over one million different campaigns in 2012. In 2013, an increase of 81% to US\$5.1 billion was estimated (Massolution, 2013). Different forms of rewards for crowdworkers as participants in these projects exist. At the time of the investment, the initiator of the project is obliged to repay the given amount monetarily or with products or services (Pelzer et al., 2012). More common is the so-called ‘investment crowdfunding’ [Barnett, (2013), p.1] where the financing party becomes a shareholder in the project or the company. The term crowdfinancing comprises investments in start-ups by the crowd (Pelzer et al., 2012). Eight percent (the equivalent of 4 million) of German internet users already have participated or are willing to participate in the investments of start-ups. 12% have already engaged in social projects, and 22% agree to contribute in the future (BITKOM, 2013).

- a Founded by Perry Chen, Yancey Strickler and Charles Adler, the crowdfunding platform Kickstarter launched in 2009. Since then, 5.4 million individuals have contributed US\$929 million as part of 54,000 projects. Kickstarter (2013, p.1) focuses on creative projects of “filmmakers, musicians, artists, and designers” although it is not involved in the projects themselves. For Kickstarter, the economic interests of the crowdworkers are not relevant. It therefore works B2B as well as B2C while providing solutions for consumers or businesses as project initiators for a business relation between consumers (C2C and C2B). Project initiators have to meet certain guidelines in order to have their project accepted for funding. Projects must be fully funded in order to receive the announced amount. To date, 44% of all projects were able to be successfully funded. Kickstarter does not claim ownership of any projects, and project creators have to pay a commission of 5% of the funded amount. As Kickstarter (2012) uses Amazon Payments for the payment transaction, an additional 3 to 5% is charged by the provider. An annual revenue of US\$20 million was estimated in 2013 (Popper, 2013), and between 2009 and 2011 its revenue was US\$2 million (Yarrow, 2011). Kickstarter is currently expanding its services internationally (Popper, 2013).
- b Founded in 2012, Companisto is a German platform for crowdfinancing on which investors can help to finance young and innovative start-ups. Each start-up has to present itself via a business and financing plan. Investors can participate in the start-up with an amount between €5 to €25,000 and become company shareholders

as a result. Companisto (2013) currently has seven employees, 24 registered start-ups, 11,817 investors, and a total investment amount of €3,862,430.

The three dimensions of shareconomy offer a wide array of possibilities for sharing digital content and physical goods, or participating in commercial, cultural, or social projects with business models aiming at both consumers and businesses. The focus here is on the sharing individual. The willingness of individuals to share digital content is currently at its highest. Each dimension has different requirements for its feasibility, and each is original when it comes to the different successful examples of use.

5 Entrepreneurship and shareconomy

Shareconomy is closely connected to entrepreneurship and requires modern ICT. Therefore, entrepreneurs active in shareconomy are described as digital entrepreneurs that use modern ICT to create business opportunities (Segui, 2010). Shareconomy serves as a source of new business models which can successfully be implemented by entrepreneurs, as illustrated by examples like Dropbox or Airbnb (see Chapter 3). These developments offer particular opportunities for entrepreneurship. Shareconomy is based on a new thinking beyond the conventional ownership-based economy. As established enterprises need to adapt, entrepreneurs are able to step into new markets (Kempf, 2013). “The sharing concept has created markets out of things that wouldn’t have been considered monetizable assets before” [Gerom, (2013), p.66], such as renting a private room for pets to stay in using DogVacay.

Economists are currently unsure if shareconomy only adds new markets or replaces existing ones (Gerom, 2013). Still, certainty about enormous shareconomy market growth exists, which contributes to its economic attractiveness (see, e.g., Grassmuck, 2012; Dierig, 2013; Kempf, 2013; Mühl, 2013). For young entrepreneurs in particular, an entrepreneurial involvement in shareconomy offers specific advantages since they can use their relation to a younger generation which is more willing to take part in a shareconomy than the average internet user (BITKOM, 2013).

In the following, the three dimension of shareconomy will be analysed as potential seedbeds for entrepreneurship. The advantages, disadvantages, and results from practice will be taken into account.

5.1 Sharing of digital content

The characteristics of digital content offer favourable conditions for entrepreneurs. New structure: The requirements for starting an economic activity with digital content are marginal when it comes to investments and abilities. Investments in ICT infrastructure and equipment such as servers or notebooks are often already on hand. Acquisition costs remain low in comparison to industrial production models. No extra premises are necessary to become an entrepreneur with digital content: successful start-ups like Facebook and Dropbox started out in a university dorm room (Carlson, 2010; Barret, 2011). Furthermore, everyone can create digital content (Mullan, 2011), with individuals today having experience in producing and sharing digital content such as pictures or music via an increasing use of social media and smart phones (Kempf, 2013). In terms of performance, the fixed cost degression mentioned above contributes to quicker profits.

The abrasion of digital content is minor, and its convertibility and reproducibility is possible with a minimum of effort (Seidenfaden, 2006). Furthermore, the carrier medium is irrelevant. The technological diversity results in changes in the market structures of the content industry (Seidenfaden, 2006). Ratten (2013) hypothesises that individuals with a higher entrepreneurial capability are more likely to actively engage and use technological innovations such as cloud computing at a higher rate. Since content quality is regarded as the main driver of a commercial success of any content, this is what entrepreneurs will need to focus on the most (Brandtweiner, 2000). New business models can be implemented where application entrepreneurs have no disadvantage in experiences compared to established enterprises. Corporate actors change from a monopolistic point of view in the market to developing a network with competitors. Since the consumer is today well informed about alternatives, his influence rises within the business model. Digital content should be sold in different formats (e.g., mobile and online) with the use of new sales channels (Swatman et al., 2006). Seidenfaden (2006) distinguishes between direct and indirect business models. Since digital content is easily reproducible, most of it is offered free of charge (see, e.g., Dyson, 1995; Grimm, 2003). Dropbox and Megaupload support this thinking in how on both platforms, basic applications can be used without charge. With direct business models, the revenues are generated through the sales of content (e.g., via licenses). With indirect business models, the revenues are generated with advertisement on the platform (Seidenfaden, 2006). Dropbox (2013) represents a direct business model because no advertisement is shown to users. The business model of Megaupload was mixed, selling premium accounts for their services directly while also using advertisements (Brinkmann, 2012). Solutions for businesses (B2B) and consumers (B2C) have been provided by both examples.

Digital content bring conflicts with it. Because no limit in capacity exists as a regulation, economic rules for the determination of the supply quantity cannot be applied for it. Experts are uncertain whether digital content can be categorised as private or free/public information. The simple process of reproducibility prevents the emergence of an effect of austerity in the case of high demand as is typically seen with physical goods. The minor abrasion of digital content with an increasing number of users is causing a non-rivalry between consumers, which would lead to a categorisation of digital content as public goods. Subsidiary legislation for copyrights etc. are needed to ensure a perfection of the market of digital content (Seidenfaden, 2006). On one hand, this temporary freedom results in low limits for the business models of entrepreneurs in the first dimension of shareconomy. On the other hand, this freedom should be practiced carefully. Dropbox has struggled with their data protection, while Megaupload was shut down due to copyright violations (Barret, 2011; Brinkmann, 2012).

5.2 *Sharing of physical goods*

The potential for the second dimension of shareconomy, sharing of physical goods, is high. Less used today than filesharing [referring to German internet users BITKOM (2013)], growth is nevertheless expected here (Kempf, 2013). It therefore represents an attractive field for entrepreneurs.

Physical goods have economic disadvantages in comparison to digital content: abrasion increases with a growing number of users, and their convertibility and reproducibility requires high investments. In addition, in order to produce a physical good, a production plant needs to be built (Seidenfaden, 2006). This field is dominated by

established companies who have already been active in a related market and can access higher financial resources (as entrepreneurs usually do). In Germany, the mobility company Deutsche Bahn offers Call a Bike, a sharing system for bikes in German cities. Complete with an own borrowing infrastructure (Deutsche Bahn, 2010), registered users take and drop off their bikes at installed stations. The credit institution Citigroup operates the largest bike sharing system in North America in New York with an identical system (Citi Bike, 2013). And for car sharing, BMW in cooperation with Mini and the car rental company Sixt operates a system with its own cars (DriveNow, 2013).

This dimension still remains attractive for entrepreneurs with a differing business model. Here, the entrepreneur needs to provide the infrastructure and regulations for the sharing of physical goods that are offered by one user and rented by another. The entrepreneur does not need to invest in an ownership of the shared goods. With this principle, entrepreneurs become intermediators of the leading “What’s mine is yours” shareconomy principle. Airbnb is one example of this. The company does not own the accommodations it offers, but instead provides the infrastructure for the owners to earn money by renting their apartments (Airbnb, 2013). This example shows the high profitability of charging commission for a provided infrastructure. People can offer part of their driveway as a parking spot to others via Parking Panda (2013) or other underutilised assets such as a baby stroller via Rentoid (2013). With this peer-to-peer sharing, “People providing these services in many ways are entrepreneurs or micro-entrepreneurs” according to an interview with Airbnb CEO Brian Chesky [Gerom, (2013), p.61]. The second dimension where a peer-to-peer platform focuses on similar dimensions of business models such as those seen with the first dimension is where consumers share their assets with other individuals with a private (C2C) or business focus (C2B). Which one is irrelevant for the providing entrepreneur (B2B or B2C).

As these models of shareconomy grow and develop, legal grey areas can be identified that represent a risk for entrepreneurs. The legality of Airbnb is currently being investigated as cities like New York claim that no taxes have been paid by tourists who have booked the accommodations offered on it (Kuntz, 2013). The car sharing platform SideCar has been sued for their operating guidelines (Hoge, 2013). So a legal basis for user protection etc. clearly needs to be developed and published to decrease the economic risks for new entrants into these markets (Gerom, 2013).

5.3 Participation in commercial, cultural and social projects

The third dimension of shareconomy can be regarded as advantageous for entrepreneurship from both a user and provider perspective. Access to the financial resources of a crowd can enable an individual to become an entrepreneur when a project is financed by crowdfunding (see Smith et al., 2013). Therefore, crowdfunding fosters the implementation of start-ups and entrepreneurship as a result (Kempf, 2013). As a result, entrepreneurs are less dependent on their own financial resources, venture capitalists, or business angels. As a necessity, they need to attractively promote their idea to motivate a crowd to invest. They also have to be willing to sell the crowdworkers shares of their company or project, or agree to an obligation to pay them monetarily (Pelzer et al., 2012). Therefore, crowdfunding and crowdfunding are often used by single individuals with a specific, innovative idea (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). This business model works for privately focused individuals (B2C) as well as those with a business focus (B2B).

As a provider of crowdfunding and crowdfunding, and similar to the peer-to-peer business model in the second dimension [see (2)], entrepreneurs serve as intermediators with the infrastructure and services of the platform. Revenues are generated from the commissions charged. The market for crowdfunding and crowdfunding is increasing. It is a recently established market which therefore offers particular chances for entrepreneurs when considering that other corporate actors are also inexperienced in this particular field (see Seidenfaden, 2006). The leading crowdfunding platform Kickstarter [see Chapter 3, (3)a] as well as its main competitors (e.g., indiegogo, 2013) were founded by entrepreneurs (Kickstarter, 2013). The more specialised crowdfunding platform Companisto (2013) offers an additional example. These companies point out that crowdfunding and crowdfunding platforms do not need to be globally present in order to be successful. Kickstarter started out in the home country of the entrepreneurs (the USA), and began only recently to expand internationally (Popper, 2013). Companisto (2013) is only present in Germany. Still, the landscape of the third dimension of shareconomy illustrates a domination of entrepreneurs. Their closeness to the thinking of project initiators in the crowd offers an advantage.

Shareconomy in general is an attractive field and strongly connected to digital entrepreneurship. Each of the three dimensions provides economic opportunities for entrepreneurs. Most of the examples of use show that the business model of entrepreneurs does not involve a creation or production of content or goods themselves. Entrepreneurs are active as peer-to-peer intermediators between individuals who want to share and rent assets from one another.

6 Conclusions

Shareconomy constitutes new and various opportunities for entrepreneurs. Importantly, it is not tied to 'limits to growth'. Innovative and niche-filling activities and business opportunities in the field of sharing are options for entrepreneurial success. This so far unexplored and unsupported statement can now be confirmed in line with the assumptions described in this article. Sharing and thus reducing the individual consumption of potential customers as a business model has so far remained relatively unknown, with the applicability of sharing described in only the rarest of instances.

Composed of three dimensions, shareconomy represents a promising opportunity for entrepreneurs with a large potential user base. Sharing of digital content, the first dimension, allows entrepreneurs to easily generate content, share it through social networks, effortlessly adapt it to consumer needs and generate quick profits due to declining fixed cost and economies of scale through the simple reproduction process. Although no extra premises are necessary to become an entrepreneur in this dimension, entrepreneurs are subject to potential struggles with data protection and copyright violations. Entrepreneurs in the second dimension, the sharing of physical goods, profit from their role as intermediary that does not require ownership of goods, a high profitability due to the charge of commission for provided infrastructure and a positive future outlook due to high expected user growth rates. However, entrepreneurs in this dimension face tough competition from established companies with access to higher financial resources and suffer from the risk of legal grey areas and the lack of a legal basis for user protection. Participation in commercial, cultural and social project through crowdfunding and crowdfunding, the third dimension of shareconomy, fosters

entrepreneurship, as individuals solely need to convince others of their idea. Therefore, entrepreneurs are less dependent of their own financial resources, venture capitalists and business angels but are obliged to repay the given amount of their investors in form of monetary payment of with products and services. Nevertheless, the monetary incentive of the business models is key and should not be discarded or neglected in the discussion about the ethics of generally beneficial sharing.

The rapid growth of applications in the field of shareconomy and the many positive annual reports of start-up companies in particular indicate a prospective growth market and economic opportunities. The potential user base is increasing as for example 85% of Germans are willing to share their physical goods online and thus offers opportunities for future revenue generation. Additionally, the possibility of reducing individual consumption by sharing will open new opportunities for sustainability-driven entrepreneurship. The growth of current very infrequently applied models of sharing within the three dimensions is expected to be strong in the future e.g. with any type of mobility (boats, planes, scooters, trains, along with the already highly popular cars and bikes); household appliances (kitchen tools or work tools); and sport (sports equipment such a surf boards or golf equipment).

Despite the expected growth of the shareconomy, critics raise the concern that these business models only reward a small number of individuals for finding ways to evade taxes and regulations (e.g., in the case of Airbnb) and therefore do not contribute positively to the economy (Baker, 2014). We argue however, that this might trigger a discussion in the relevance of current rules and regulations. Further, we expect sharing to play an increasingly relevant role in the existing dimensions and even in the professional field. Following the approach of crowdsourcing in which tasks are transferred in interdisciplinary, partly unknown groups, creating large pools of workers in permanent employment enables their service as needed for various companies (i.e., not with temporarily contracted workers). We assume that sharing of manpower and relevant skills would be of value for consortia of cities as over-capacity would be avoided through flexible and targeted use of excess workforce. This approach is already being used rudimentarily in the field of smart cities. The extension of the value chain for the founder and the creation of business models away from the provision of remote digital platforms is another future potential shareconomy expansion.

This partly speculative outlook on the field of shareconomy shows the need for extensive further research to explore other fields of application, additional opportunities for entrepreneurs, and potential consequences for established companies. Furthermore, the connections to smart cities, digital entrepreneurs, and the pure dependence on providing the technical platforms to achieve these must be examined.

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Publication III

Richter, C.

**Crowdcreation as a dimension of crowdsourcing:
conditions for entrepreneurs**

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Crowdcreation as a dimension of crowdsourcing: conditions for entrepreneurs

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Abstract: Crowdsourcing with its characteristics illustrates new opportunities for entrepreneurs to outsource tasks, diminish risks and access a global base of resources. Crowdcreation as one dimension of crowdsourcing offers particular conditions to improve efficiency and effectiveness of the creation procedure of products, processes and services. The knowledge of the crowd can be used for generating ideas, adopting microtasks and designing drafts. Crowdcreation represents a lever for entrepreneurship to access a global workforce while decreasing costs. The involvement of the crowd diminishes risks of economic failure. This paper contributes to the young foundation of scientific research on the topic with a literature review on crowdsourcing in general as well as crowdcreation in detail. The conditions for entrepreneurs provided by crowdcreation are then analysed and discussed. This work is completed with an outlook on further research in this field.

Keywords: crowdcreation; crowdsourcing; entrepreneurs; SME; efficiency; digitalisation; digital entrepreneur; crowdvoting.

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1 Introduction in the field of crowdsourcing

Digitalisation has significantly increased the relevance of the internet. In 2012, about 2.4 billion persons used the internet worldwide. The growth rate between 2000 and 2012 reached almost 570% (Internet World Stats, 2013). This megatrend affects organisations as well as individuals. Markets are more and more saturated with digital equipment and accounts (Stalder, 2009; Smith and Hunt, 2013). People today are able to communicate, access and provide information constantly (Castells, 2009; Wolf et al., 2012). This phenomena is comprised by the term 'SharEconomy' or information society of the 21st century (Kreutzer, 2013). The willingness of individuals to share personal information,

data, goods, knowledge, etc., is increasing (Botsman and Rogers, 2011; Kempf, 2013). Weitzmann (1984) coined the term 'share economy' in 1984 in a positive way, stating that shared labour contracts are more productive than traditional labour contracts and lead to a higher revenue and less unemployment rates. Following Forbes, profits generated through SharEconomy reached more than US\$3.5 billion in 2013, with an annual growth of up to 25% to 2014 (Gerom, 2013). Exploitation, detention, usage and dissemination of all kinds of information grow in their importance in the value-added process (Piller, 2006).

Crowdsourcing, as the sharing of specific assignments of tasks, represents a dimension of the sharing culture enabled by digitalisation. The crowd, as a group of internet users, agrees to solve the assigned task (Gassmann, 2012). This process of outsourcing facilitates the overcome of limitations regarding access to financial and human resources or deficient expertise in a particular area for an internal solution. Crowdcreation furthermore relates to the innovation processes conducted by the crowd (Leimeister and Zogaj, 2013). Innovations represent a major source of competitive advantage (Dess and Picken, 2000; Sirmon et al., 2011), constant innovation ensures the capability of an organisation to compete (Grundström et al., 2011). Entrepreneurs usually only possess very limited resources. Innovation becomes crucial during the process of foundation (Bessant and Tidd, 2007) and afterwards. The dependence on innovations and creative solutions in order to fill niches in established markets is high (e.g., Kraus et al., 2008). Schumpeter describes innovation as the reconstitution of already existing production factors to create something new. Therefore, the destroying or break-up of established factors or mindsets comes before the new creation, called 'creative destruction' (Schumpeter, 1942). Scientific research on crowdsourcing in relation to entrepreneurship is minor and connected to concrete research questions rather than building a bond between these two topics (e.g., Smith et al., 2013). Therefore, this article seeks to contribute to the identified research gap by providing insights on advantageous and disadvantageous conditions crowdcreation offers for entrepreneurship.

The content of this paper is based on a comprehensive literature analysis of scientific publications on crowdsourcing in general and crowdcreation in particular from the period 2000 to 2014. It must be noted that this work is not a pure literature review, but rather the assessment of opportunities for entrepreneurs in the field of crowdcreation. Due to crowdsourcing being an interdisciplinary approach, business and management publications were considered, along with works on communications, culture, and human resources. Additional studies cited by these works are incorporated into this article. Scientific publications generated from database search or Google search results have additionally been taken into account as crowdsourcing (Doan et al., 2011) and crowdcreation (Skaržauskaitė, 2012) are in a young stage of scientific research. Publications were identified and selected based on certain key words (including crowdsourcing, crowdcreation and entrepreneurship) in their titles and/or abstracts.

This article is structured as follows: first, subsequent to the introduction, the theoretical foundations, including definitions and dimensions of crowdsourcing are presented. Second, crowdcreation as a concept is introduced in this section. The three dimension of crowdcreation will furthermore be analysed in the third section. Fourth, the conditions for entrepreneurship, offered by crowdcreation are discussed. The outlook on future research and conclusion completes this study.

2 Definitions and dimensions of crowdsourcing

This section deals with definitions and dimensions of crowdsourcing as the overall concept comprising crowdcreation. It aims to establish a theoretical foundation for further remarks.

The approach of crowdsourcing is in an early state of scientific research (Howe, 2008). Deviating definitions exist (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). We follow Howe's (2006a, 2006b, 2008) definition as the most prominent scientific representative of crowdsourcing (Brabham, 2009; Starbird, 2012).

“The act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call.” [Howe, (2006b), p.1]

Crowdsourcing implies several dimensions. The concept being a young scientific approach, is categorised with deviating terms in the literature while rigidity in strategy and focal points exists (Pelzer, 2011). We follow Leimeister and Zogaj's (2013) classification since it takes important scientific contributions to the topic into account (e.g., Howe, 2006a, 2008; Rouse, 2010; Unterberg, 2010). They differentiate between three different dimensions of crowdsourcing,

- 1 crowdvoting (also crowdtesting)
- 2 crowdfunding and crowdcreation.

Crowdsourcing incentives, aiming to receive support through the integration of a crowd in the decision-making process are regarded as crowdvoting (Unterberg, 2010). For the execution of crowdvoting, the crowd is called on participating in the selection and evaluation process through evaluating, voting and recommending, etc. (Leimeister, 2012; Solemon et al., 2013).

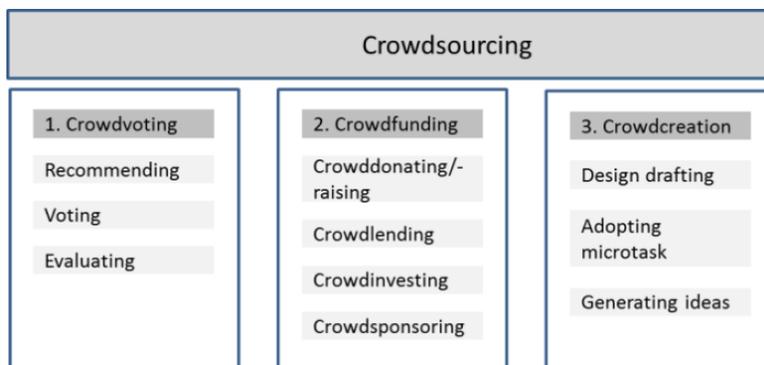
For crowdfunding, the crowd provides funding to the initiator (Agrawal et al., 2013; Unterberg, 2010). The approach from 2006 (Lawton and Marom, 2010) is based on receiving external public funding (Harrisson, 2013). Each member of the crowd can contribute to the funding by providing a small financial amount (Belleflamme et al., 2011; Bradford, 2012). Scholars differentiate between four specifications of crowdfunding. Leimeister (2012, p.389) distinguishes between 'crowdsponsoring, crowdinvesting, crowdlending and crowddonating/-raising'. Crowdsponsoring aims at financing projects with products or social appreciation as a reward. Crowdinvesting is structured similarly to crowdsponsoring with the focus on organisations and start-ups (Hornuf and Klöhn, 2013). Crowdlending is characterised by monetary rewards while crowddonating/-raising contributes to projects without rewarding (Leimeister and Zogaj, 2013).

Crowdcreation consists of three different parts, comprised by the effect of composition by the crowd: 'generating ideas', 'adopting microtasks' and 'design drafting' [Leimeister, (2012, p.390), see also Unterberg, 2010] and therefore is the most complex dimension of crowdsourcing due to the open problem questions (Pedersen et al., 2013).

Crowdcreation is of significant importance for the innovative activities in general (e.g., Suciú and Suciú, 2012). The crowd is integrated in the process of developing and creating innovations, which is comprised by the open innovation approach by Reichwald and Piller (2009). Crowdsourcing is therefore often analysed in connection to co-innovation (e.g., Romero and Molina, 2011; Doepfer, 2012). The crowd is involved in early stages of the innovation process and generates ideas out of the product environment of the initiating organisation (Leimeister and Zogaj, 2013). IT-based idea competitions (Di Gangi and Wasko, 2009; Leimeister, 2012) or virtual idea communities (Bretschneider et al., 2012) are mainly used as tools for crowdcreation.

Figure 1 shows the three dimensions of crowdsourcing at a glance.

Figure 1 Overview of dimensions of crowdsourcing (e.g., Leimeister, 2012; Unterberg, 2010) (see online version for colours)



This article focuses on crowdcreation and its conditions for entrepreneurship for several reasons. First, crowdcreation is the most complex dimension of crowdsourcing in terms of tasks and requirements of the crowd's qualification (e.g., Leimeister and Zogaj, 2013). Second, crowdcreation strongly relates to innovation (Suciú and Suciú, 2012) as an enabler of future competitiveness of economic players (Dess and Picken, 2000; Gassmann et al., 2010). Innovation demands an access to highly qualified human resources and funds for research and development. Entrepreneurs have, in most cases, a very limited access to these resources on one hand (Bessant and Tidd, 2007). On the other hand, crowdsourcing as a phenomenon raised from Web 2.0 offers particular opportunities for entrepreneurs. It provides an propitious access to a global workforce in general as well as funding in particular. Scholars previously analysed the possibility and ways to integrate crowdsourcing in corporations (e.g., Bretschneider and Leimeister, 2011; Gassmann, 2012; Leimeister and Zogaj, 2013), some of them with specific focus on entrepreneurs for the implementation (e.g., Smith et al., 2013; Richter et al., 2014). Therefore, as a third reason, this article seeks to contribute practically to crowdcreation as an enabler of competitive capabilities for entrepreneurship in the future.

Organisations have two options in participating in every dimension of crowdsourcing: as a platform or as the user or initiator of the project (Gassmann, 2012). This article concentrates on crowdcreation and its application for entrepreneurs as initiators only.

3 Detailed analysis of crowdcreation

Subsequent to the definitions and dimensions of crowdsourcing theoretical foundations, this section deals with a more detailed introduction of the key concept of this work, crowdcreation. Crowdcreation has fundamentally transformed the understanding of value chain activities in the economy (Hess and Matt, 2013). Traditionally, organisations thought of customers as destroyers of their created value (see Schumpeter, 1942). Customers and the public takes part in creating value (Ramirez, 1999; Romero and Molina, 2011).

Crowdcreation in general, links to the idea of using ‘collaborative knowledge’ (Deutscher Crowdsourcing Verband, 2014, see figure; compare Osorio and Whitney, 2005; Surowiecki, 2005; Trkman and Trkman, 2009; Geiger and Schader, 2014). All forms leading to structuring, filtering or accumulating knowledge are comprised by this dimension (Pelzer et al., 2012). It can be applied in different areas. Dodge and Kitchin (2013) advocate for an application of the crowd’s knowledge for the collection and creation of cartographic data and maps with the objective to be able to provide hybrid cartographic services. Masum et al. (2013) refer to the open source phenomena as an established, cooperative model to improve and individualise IT programs.

Following various sub kinds of crowd creation are presented.

3.1 *Generating ideas*

Generating ideas refers to an approach of outsourcing activities in the value-added process. The activities are outsourced through economic and social communication and cooperation with the public. This concept is comprised by open innovation (Chesbrough, 2003a; Reichwald and Piller, 2009; Blohm et al., 2011; Doepfer, 2012). In today’s economy the cost pressure rises and results in an intense competition in the markets. Efficiency and effectiveness of innovative activities are crucial factors for the success of enterprises (Davenport, 2013). At the same time individualisation and therefore diversification of customer’s needs is observed. Customers demand products and services, adapted to their individual requirements. Thus, organisations have to identify the heterogeneous needs in order to adapt their products and services to it in the future (Piller, 2006). Open innovation integrates the customer up to various degrees. The ‘voice of the customer’ is used for market research in innovations, innovations from interorganisational networks integrates the customer a step further, whereas the ‘lead user’ or ‘customer-active-paradigm’ fully emits the innovation process to the customer (von Hippel, 1977; Reichwald and Piller, 2009). Typical elements of open innovation are: product innovations and arrangements by and with the customer; the crowd as the source of the initiating idea; toolkits, with which the organisation or principal provides tools the crowd needs for generating ideas or developing innovations (Bächle, 2008); a community in which a close communication between members of the crowd is essential (Aitamurto et al., 2011; Blohm et al., 2011). In terms of community, Romero and Molina (2011) propose a creation of virtual customer communities (VCC). The members of the community communicate closely as well as trustfully and interact directly with one another. The principal builds a closer relation to the customer’s needs (Chan and Lee, 2004). The initiator’s goals are two types of information on the crowd, information on customer requirements as well as direct solutions for fulfilling these requirements (Reichwald and Piller, 2009). Generating ideas enables organisation to successfully

develop and position new products or services on the market with the use of the crowd's intelligence as potential customers. Third provider of services become redundant. Cost savings (e.g., change from fixed to variable costs; reduction of coordination meetings in the product management through various ideas of the crowd; less employees in general) and an improvement of the corporate strategy are regarded as results while risks (e.g., defect product developments) are diminished (Doepfer, 2012).

3.2 Adopting microtasks

Adopting microtasks [Grimme Institut, (2012), p.2] are also referred to as 'microworking' (Deutscher Crowdsourcing Verband, 2014, see figure), 'pico jobs' [Blohm et al., (2010), p.1] for a minor financial reward. An example for microtasks is tagging, the insertion of key words (Pelzer et al., 2012). Microtasks are often integrated in more complex services (Grimme Institut, 2012). Amazon Mechanical Turk (2014) regards itself as a 'marketplace for work', an intermediary between initiator and the crowd. Adopting microtasks enables initiator as well as recipient, the crowd, a high flexibility in the task assignment, selection and financial commitment with flexible price structures. The flexibility is given by the 24/7 availability of tasks. The anonymous user can choose working hours and the initiator freely. Scholars, as Ipeirotis and Horton (2011), also identify disadvantages in mikrotasking: the tasks are standardised to a low degree. Quality control and weak reputation decreases the attractiveness of microworks.

3.3 Design drafting

Design drafting comprises creative processes, such as a design for a website or of a brand logo through the crowd (Grimme Institut, 2012). The US cookie company OREO launched a 100-day series of cookie designs in honor of its 100th anniversary, created exclusively through the crowdsourcing channel (OREO, 2014). Customers requirements tend to individualise and diversify (Gneiser, 2010). Contrary to the rising supply of products and services with the globalisation, customers want to increase their influence and involvement on design and production processes (Pine et al., 2010). Design drafting represents a possibility for the customers to actually participate in the creation process of designs via Web 2.0. The crowd influences creative value-added activities whereas the organisation receives designs, adapted to the customer's needs in a certain market environment (Prahalad and Ramaswamy, 2004). Design drafting via crowdsourcing is connected to the empathic design approach in the literature (Mattelmäki and Sleeswijk Visser, 2011). It seeks to integrate user experiences in product design during the early stages of new product development (Postma et al., 2012). Platforms are used as intermediaries between initiator and crowd (Leimeister and Zogaj, 2013).

4 Discussion of advantageousness through crowdcreation

Crowdsourcing in general, results in an advantageousness for entrepreneurs in particular (Smith et al., 2013). As one dimension of crowdsourcing, this advantageousness can be applied to crowdcreation and the three subspecies 'Generating ideas', 'Adopting microtasks' and 'Design drafting'. Thus, crowdcreation and its conditions for

entrepreneurs will be discussed in the following. First, general conditions will be introduced. Second, the subspecies of crowdcreation will be discussed.

4.1 *General conditions for entrepreneurship*

The application of crowdcreation does not require high financial investments (Kazai, 2011) by the initiator. The payment of the crowd is primarily minor comparable to offline microtasking and can be influenced by the initiator. Qualified human resources can be accessed on a global basis via Web 2.0 as well as crowdsourcing with crowdcreation (Smith et al., 2013). The pay is determined by the initiator of the project, as the entrepreneur. The resulting knowledge base is of enormous size. Entrepreneurs have a limited access to an internal workforce, during the phase of foundation especially. Crowdcreation enables entrepreneurs to solve problems like creating designs, which could not be solved with internal human resources only (Werner and Malanowski, 2011). Individuals follow the principle of self-selection, choosing a task in accordance to their competences and therefore become participant of the crowd (Malone et al., 2011). As a result, more complex problems can be solved via crowdcreation (Leimeister and Zogaj, 2013). The influence on the crowd can be used as a tool for market research (Gründerszene, 2011). Entrepreneurs are enabled to position themselves in the competitive environment. An international orientation is facilitated with global access to resources and the needs of the markets (Leimeister and Zogaj, 2013).

Entrepreneurs need to consider four factors for the practical implementation of crowdcreation:

- 1 demanding task assignment
- 2 efficient organisation
- 3 acceptable level of quality as well as diversification of the crowd (Howe, 2008).

Motivation of a number of individuals to engage in the solving process of a certain task is a crucial element of crowdcreation (Leimeister and Zogaj, 2013). Thus, the entrepreneur's focus needs to lie on the attractiveness of the problem or task to challenge a participation of a crowd (Smith et al., 2013). Motivation is categorised in extrinsic and intrinsic. Extrinsic motivation is based on external aspects such as financial rewarding while intrinsic motivation concentrates on individual advantages such as social rewarding or fun (Ryan and Deci, 2000; Hossain, 2012; Leimeister et al., 2009). Intrinsic motivation is the more stimulating element for the crowd (Reichwald and Piller, 2009). It is a result of reputation effects of the participation (Missling, 2011). Aspects of extrinsic motivation are relevant if the crowd received the permit to use the solution themselves (Piller, 2006). A combination of both motives determines the motivation of an individual to participate in the crowd. The degree of motivation influences duration, type, intensity and extent to which the individual commits to work in the crowd (Missling, 2011). Therefore, a challenging task assignment provided by entrepreneurs is crucial for the application of crowdcreation (Smith et al., 2013).

The implementation of crowdsourcing and crowdcreation in specific, leads not only to advantageous conditions, but also implies challenges for entrepreneurs (Hammon and Hippner, 2012). In order to enable a certain quality of results, the task assignment needs to be detailed and challenging (Kittur et al., 2013). Quality monitoring is of essential importance for entrepreneurs (Baba et al., 2014). The employment of an external

workforce results in a certain loss in control. Boycotts threaten usable results and the advantage of a decrease of costs. The automotive manufacturer Chevrolet applied crowdcreation for a video sport as a marketing campaign of the model Tahoe. The crowd created a video, pointing out the enormous gasoline consumption of the car (Brabham, 2008).

Following, a short consideration of perceived disadvantages of crowdcreation: if the financial effort in crowdcreation remains inconclusive, entrepreneurs with minor financial resources are endangered. In addition, the calculation of costs through crowdcreation is difficult. Penin and Burger-Helmchen (2011) state an increase of costs through interacting with a number of external individuals. Furthermore, the increased transparency of internal innovative activities results in a potential loss of knowledge. This challenge threatens established corporations as well as entrepreneurs. Corporations might be more closely monitored by the competition but an entrepreneur often builds his business on one innovative idea or concept. Therefore, the transparency has to be considered carefully the more essential the innovation is (Burger-Helmchen and Penin, 2010). The digital environment supports the 'copy cat effect' (Bonabeau, 2004), the pure imitation and copying of ideas and business models. These threats are of fundamental importance for the mentality of the internal workforce. Entrepreneurs might profit from the higher barriers of larger corporations towards crowdcreation, since they employ a large number of people (e.g., Leimeister and Zogaj, 2013).

Crowdcreation is regarded as an important lever for entrepreneurs to use the creativity and competences of the crowd (Frey et al., 2011; Lakhani et al., 2007). In the following, the specifications of generating ideas, adopting microtasks and design drafting, are discussed concerning the conditions for entrepreneurship.

4.1.1 Generating ideas

Innovations are of fundamental relevance for entrepreneurial success (Drucker, 1985). Therefore, the integration of the crowd via crowdcreation is of high importance for entrepreneurship. Innovative processes are bound to investments and risk-taking (Bessant and Tidd, 2007). For both, entrepreneurs have disadvantageous conditions competing with established organisations and big corporations. The rate of failing innovations is high, only 13% of the ideas reach market maturity, just the half of them achieve the expected goals and even 6% are commercial successes (Kriegesmann and Kerka, 2006). Building cooperation for innovations decreases risks and costs from 60% to 90% and shortens innovation cycles (Quinn and Strategy, 1994; Conway, 1995). Crowdcreation offers entrepreneurs the opportunity to minimise risks and investments while being innovative in a shorter amount of time. Entrepreneurs can use their low hierarchy and flexible structures to develop a competitive advantage with crowdcreation. Organisations with established structures often face a barrier when opening organisational insights to the public (e.g., Doepfer, 2012). The success of an innovation is determined by information about customers need as well as information about the solution to these needs (Gassmann and Sutter, 2013; Reichwald and Piller, 2009). Essential in terms of open innovation is the customer orientation with growing importance in the market environment (Chesbrough, 2003b; Flint et al., 2005; Gassmann et al., 2010). Crowdcreation offers both, adjacency to the customer as the crowd and innovative solution by the crowd. Entrepreneurs can integrate the customer flexibly and demand-oriented, from the product idea to the final product. In a combination with

crowdvoting, essential product attributes can be identified and ideas and prototypes evaluated (e.g., Piller, 2006). Open innovation can contribute to both, process and product innovations (e.g., Schumpeter, 1942; Reichwald and Piller, 2009). In the past, scholars focused on an implementation in large organisations while currently entrepreneurship receives growing attention (McPhee and Segers, 2013). Crowdcreation is particularly important for product development (Leimeister and Zogaj, 2013). Examples of big corporations implementing crowdcreation in product development exist. McDonalds outsourced the product development, new burgers, in an initiative called MyBurger to the crowd without financial rewarding. Reasons could be selfishness (eating my own burger), seeking attention or a loyal customer relationship. The crowd afterwards voted for the best burgers, which were then produced and put on the market (Grimme Institut, 2012). Design by ME as a Lego product represents a further example. The customer contributed ideas with the creation of plans for models and influenced future product models (Hatch and Schultz, 2010). McDonalds and Lego diminished costs as well as risks since the innovation received agreement and attention of an amount of people being potential future customers. Further examples of process innovation exist. Software and IT-programs are improved by the crowd. So-called open source software (OSS) are publicly available with source codes but without charge. Individuals, identifying the need for improvement during the usage, can work on these software, e.g., Open Office for free as a substitute for Microsoft Office (Olson and Rosacker, 2013). Crowdcreation therefore also serves as a marketing instrument. Integrating the customers in the development or adaption process of ideas, an emotional connection and loyalty to the organisation is built. Emotional connection and loyalty to the brand for entrepreneurs with their newly found businesses are typically low. The acceptance of the organisation and the product can be increased (Reichwald and Piller, 2009). Higher transparency leads to a positive brand image, generating competitive advantages for less prominent organisations in particular (Gassmann, 2012).

4.1.2 Adopting microtasks

The adoption of microtasks implies a faster processing of tasks following the principle of division of labour (Reichwald and Piller, 2009). Entrepreneurs outsource smaller tasks and increase their focus on working and building core competences (e.g., Malone et al., 2011; Maiolini and Naggi, 2011). The employment of the crowd for microtasking is flexible (Hartje, 2013). The financial effort is minor and decreasing steadily (e.g., Blohm et al., 2010). The average pay for microtasks used to be around 5 Euros and dropped to cents within a year (Ortmann, 2012). Microtasks are therefore advantageous for entrepreneurs with financial limits. Examples for microtasks are the checking of address data, checking of menus in restaurants, composing standardised text passages or information research. Corporations (e.g., Deutsche Telekom) outsource microtasks as well as start-ups and entrepreneurs (sharewise) (Clickworker, 2014). Individuals can assign themselves to tasks and work on them on their smart phone or computer. Originally, microtask platforms were founded for a peer-to-peer market but increasingly focus on organisational initiators (Ortmann, 2012). Still, entrepreneurs need to consider the usage of microtasking carefully, depending on the project. First, the entire projects needs to be divided into easy and small tasks, which are accomplished by the crowd following a consistent schema. The division and description of these microtasks requires a certain time effort. Thus, entrepreneurs need to consider their own time effort for

creating microtasks in relation to the time effort taken over by the crowd. Second, the tasks of the projects need to be worked on and realised online. Third, the microtasks need to be formulated and solvable by non-experts. Fourth, all information needed by the crowd to work on the tasks are made public to a group of individuals online. This publication leads to a higher transparency (see general conditions for entrepreneurship). Entrepreneurs need to evaluate the importance of internal information and data published online (Hartje, 2013). Attempts of deception have been observed in the past (Eickhoff and De Vries, 2011; Hirth et al., 2011).

4.1.3 Design drafting

The specification of design drafting is closely connected to generating ideas. Thus, the conditions can be applied to this specification. Design drafting focus on art projects in particular as logo, web page, graphic, brochure or clothes design (DesignCrowd, 2013). Established brands such as Coca Cola, Greenpeace, Doritos, The Olympics or Toyota used graphical und creative designs drafted by the crowd (The Next Web, 2012). As a disadvantage, authors claim the missing quality of the designs. The idea is based on receiving a high variety of designs for a low amount of money, as a logo for US\$1,000. Most likely, the members of the crowd will not invest as much time and effort in designing a logo, book covers, label designs or web designs as one assigned design student for instance, when they already know their chance to win the design competition is low. In addition, the designs are often very much alike, as the crowd adapts existing designs in order to further decrease their input (Airy, 2012; Archer, n.d.). Another disadvantage of crowdsourcing is the free rider issue (Adar and Huberman, 2000; Huberman et al., 2009). That means that individuals look at the ideas of others and use them for own projects without contributing own work for the crowd. Guy Kawasaki, a book author, used crowdcreation for the design of a new cover for his book. He agreed to pay US\$1,000 and received 760 designs from 226 designers overall. As the quality of crowdcreated design drafts was too low, he hired a professional designer afterwards (Archer, n.d.).

To summarise the content, the advantages and disadvantages of crowdcreation are presented in Table 1.

Table 1 Advantages and disadvantages of crowdcreation

<i>Crowdcreation for entrepreneurs</i>	
<i>Advantages/chances</i>	<i>Disadvantages/fears</i>
Access to creativity and competences	Certain loss of quality control
Access to external resources and/or international resources	Copy cat effect – fear of innovation theft
Access to innovation-oriented ideas	Effort needed for dividing work task in small pieces
Business development (product and brand development)	Free rider issue (copy and paste approach)
High flexibility	More complex cost calculation
Market research and market testing	Loss of internal acknowledge
Marketing instrument	

Especially in the early stage of a business, crowdcreation or crowdsourcing is a chance to integrate external resources without increasing fixed costs. It is a possibility to involve creativity and innovations, the business idea and the thread to execute this idea must be present by the entrepreneur. Crowdcreation is therefore a quality option in the field of innovation management.

5 Future research and conclusions

Crowdsourcing, the dimension of crowdcreation in specific, represent young fields of academic research. Previous studies primarily concentrated on basic elements, such as crowdsourcing in general (e.g., Aitamurto et al., 2011), the crowd (e.g., Baba et al., 2014) or the task (e.g., Eickhoff and De Vries, 2011). Still, no distinct consensus on definitions, dimensions or characteristics exist (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). Overall, the studies are conceptual and need to be empirically proved. The principals or initiators of crowdsourcing so far received little scientific attention. The connection to entrepreneurship for both, crowdsourcing and crowdcreation is widely unfathomed. Blogs for entrepreneurs discuss conditions, which have so far not been proved empirically by scientific scholars, except crowdfunding (e.g., Mollick, 2014). A next step requires an examination of characteristics of entrepreneurs applying crowdsourcing dimensions.

Crowdsourcing and crowdcreation imply risks for entrepreneurship such as increased transparency and potential quality loss. A consideration of these risks is important for entrepreneurship. Still, the application of the crowd's competences facilitates entrepreneurs to receive an added value with a qualified global workforce and low capital intensity. The integration of the customer in innovative processes is of fundamental relevance for the economic success of entrepreneurs. Crowdcreation results in an adjacency to a wide range of individuals and potential customers through the crowd. It provides a unique possibility to ensure a future success of innovations and therefore of the founded business. Crowdsourcing as a part of SharEconomy and the principle 'what's mine is yours', is growing in its importance. SharEconomy has been the key topic of the globally leading IT-fair CeBIT. The McKinsey Global Institute forecasted an increase of productivity in organisations applying methodologies of SharEconomy of 12% (CeBIT, 2013).

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Publication IV

Kraus, S., Richter, C., Papagiannidis, S., and Durst, S.
**Innovating and Exploiting Entrepreneurial Opportunities in Smart Cities:
Evidence from Germany**

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Innovating and Exploiting Entrepreneurial Opportunities in Smart Cities: Evidence from Germany

Sascha Kraus, Chris Richter, Savvas Papagiannidis and Susanne Durst

Smart City initiatives are considered a vehicle for achieving sustainable development of urban growth. This paper explores the conditions and factors that affect innovation in Smart Cities from an entrepreneurial vantage point. Data was obtained through a series of interviews with German entrepreneurs active in Smart Cities. Beyond examining the importance of a set of factors that originate from the extant literature, our findings suggest that entrepreneurs believe that Smart City initiatives need a clear vision to drive their development and growth and that government has a key role to play in bringing the necessary resources and stakeholders together.

Introduction

Interest in Smart Cities has been rising since the 1990s (Iranos & Gertner, 2012), with research projects studying them from a number of vantage points (e.g., Bunnell & Coe, 2001; Doel & Hubbard, 2002; Caragliu, Del Bo, & Nijkamp, 2011; Schaffers et al., 2011; Chapin, 2012; Groen & Walsh, 2013a, 2013b). The attention of past studies has been primarily on two main groups of stakeholders: public actors, such as government agents and policy makers, and private actors, such as the city's users and inhabitants. Little research effort has been invested, though, in a third group of stakeholders who contribute greatly to the economic and social development of a city – the entrepreneurs. Technology entrepreneurship, the processes by which entrepreneurs assemble organizational resources and technical systems, and the strategies used to pursue entrepreneurship opportunities, can play a crucial role in urban and regional transformation (Shane & Venkataraman, 2003; Venkataraman, 2004). By operating typically small businesses, entrepreneurs find applications for particular technologies, launching new products based

on scientific and technical knowledge and work to generate technological change (Bailletti, 2012). This is especially true when it comes to Smart Cities, given that they are heavily underpinned by innovative technological solutions (Shapiro, 2006; Giffinger et al., 2007; Chourabi et al., 2012).

Focusing on entrepreneurs is of interest, as Smart Cities result in the creation of new business locations (Doel & Hubbard, 2002) which can offer a stage on which to exploit new opportunities. This is reflected in the fact that a higher degree of entrepreneurship in Smart Cities in comparison to other cities has been reported in the literature (Iranos & Gertner, 2012). Smart Cities are of interest to entrepreneurs as they provide ample scope for innovation and business opportunities. The opportunity to operate within a 'smart' environment can attract entrepreneurs from cities that do not offer the necessary infrastructure, neither can they offer the same opportunities. Hollands (2008) calls Smart Cities the 'high-tech variation of urban entrepreneurialism' (p. 305) based on city transformation (Jessop, 1997) with high potential for innovation and creativity. Prior

studies have typically focused on single factors contributing to the development of Smart Cities (Shapiro, 2006; Giffinger et al., 2007; Caragliu et al., 2011; Hernández-Muñoz et al., 2011). There are only few studies which consider all the relevant factors for a Smart City in a broader manner, examining multiple factors and considering their relative significance.

To address the above two research gaps, this paper empirically extends the work of Richter, Kraus, and Syrjä (2015), concentrating on twelve entrepreneurs operating within Smart Cities in Germany. It does so by exploring their perceptions of the role that key ingredients play in the establishment and development of Smart Cities. We also aim to identify any other factors that these entrepreneurs thought could play a significant role in venture creation and growth within Smart Cities.

Conceptual Elements of Smart Cities

Smart Cities are agglomerated areas of high concentrations of learning and innovation (Richter et al., 2015, p. 216). In such areas creativity, innovation and entrepreneurship, coupled with digital infrastructure, aim to drive economic growth and a better quality of life. Currently, cities exploit the lack of a precise definition to self-label themselves as a Smart City (Caragliu et al., 2011; Tranos & Gertner, 2012). As no internationally accepted standards have been set for evaluating Smart Cities (Marsal-Llacuna, Colomer-Llinas, & Melendez-Frigola, 2015), in order to frame our research, we will adopt six key characteristics (Hollands, 2008, p. 307). We discuss these in more detail below.

ICT Infrastructure and Information Management

The most important characteristic of a Smart City is the quality of the available ICT infrastructure (Hollands, 2008; Caragliu et al., 2011; Thite, 2011). Digital technologies like the Internet or Web 2.0 and highly developed network technologies are crucial for urban development (Schaffers et al., 2011). The technical challenge is to build the foundation for an environment with information sharing, collaboration, interoperability and seamless experiences for all inhabitants anywhere in the city (Nam & Pardo, 2011). Modern information and communication technologies (ICT) are the 'enablers for urban welfare' in the fields of energy efficiency, environment and health (Schaffers et al., 2011, p. 432). This is possible by constantly measuring, adjusting, improving

and re-measuring ICTs (Hernández-Muñoz et al., 2011). In addition, data availability rises significantly within city-based clouds (Schaffers et al., 2011), to which two main sources of information contribute, namely information collected by the public sector (e.g., via sensors, elements, open data) and information generated by the city's inhabitants (on social media, crowdsourcing, etc.) (Bakici, Almirall, & Wareham, 2013).

The implementation of ICT increases efficiency and contributes to social, cultural and urban growth in Smart Cities (Komninos, 2006; Hollands, 2008; Caragliu et al., 2011). The Internet and related technologies can lower the entry barriers for entrepreneurs who want to offer digital services and applications at the local and regional level, making it possible to exploit new opportunities. Establishing a close link between a Smart City initiative and the ICT-oriented companies can be helpful in adopting a strategic perspective when it comes to creating, establishing and implementing Smart Cities technologies, even in times of recession (Paroutis, Bennett, & Heracleous, 2014).

Business-Led Urban Development

Business-led urban development emphasizes the transformation process, especially in western cities, from a managerial to a rather entrepreneurial perspective in urban governance (Harvey, 1989; Quilley, 2000). The collection, analysis, interpretation of data and implementation of new technological approaches encourages intensive change in urban development (Kitchin, 2014). In turn, this could be a source of entrepreneurial opportunities (Lee, Phaal, & Lee, 2013). To generate urban growth, private capital investments have become a decisive factor for Smart Cities, as public investments are often ineffective, due to their relatively small size. Local governments need to foster and attract private capital to ensure urban development (Hollands, 2008). On the other hand, Lee, Hancock, and Hu (2014) consider public institutions as playing a catalytic role when it comes to fostering 'smart service innovation' by establishing strong public funding. Either way, it is very important for local governments to stimulate the necessary conditions for the private sector, encouraging close links between the two sides, which in some cases leads to a close co-operation as in public-private partnerships (Harvey, 2000). Examples include the development of science parks, cyber-ports or medical ports by governments (Jessop &

Sum, 2000) to attract more entrepreneurial individuals and organizations.

Social Inclusion of Urban Residents in Public Services

Social inclusion, defined as 'to be accepted and to participate fully within our families, our communities, and our society' (Guildford, 2000, p. 1), is the basis for social quality as well as socio-economic security, social cohesion and empowerment (Putnam, 2001; Huxley & Thornicroft, 2003). Social inclusion in public services incorporates the provision of governmental services to all urban residents, citizens, businesses and employees via ICT (Hollands, 2008; Caragliu et al., 2011). According to Coe, Paquet, and Roy (2001), E-Governance and Smart Communities are options to simplify the exchange between residents and the city council, whereas Schaffers et al. (2011) offer the approach of co-operation frameworks for open innovation (Konsti-Laakso, Pikhala, & Kraus, 2012). An increase in the government's efficiency can be achieved with the integration and the offer to participate to the citizens as well as the availability of the public sector's open data (Bakici et al., 2013). Lee et al. (2014) confirm that data movement and participatory service design are crucial for the improvement of a city's civic engagement. A strategic approach to involving residents more when it comes to optimizing the 'S-curve' of adoption can be supported by a clear and long-term-oriented roadmap (Lee et al., 2013). This co-ordinated roadmap has to consider the multiple interests of the state, the companies, the scientists and the entrepreneurs in terms of efficiency and effectiveness. The main task is the linking of future industries, the information and telecommunication (ITC) industry with the classic sectors for the benefit of the city and their citizens.

Role of Social and Relational Capital

Putnam (1995) argues that social capital contains all the features of social organization such as networks, norms and social trust that facilitate co-ordination and co-operation for mutual benefit. Coleman (1988) suggests that without social capital, transactions would not have taken place, or at least would not have been as efficient, whereas Sauer (2012) stresses that investment in social capital is an important prerequisite for becoming a 'smart' city. Social trust in social capital is a key component. Lolle and Torpe (2011) distinguish social trust (i.e., the trust that we have towards an abstract other or trust in strangers), from

particularized trust (i.e., the trust we have in those we know or feel connected with). In societies that have high social capital and, in particular, high social trust, when economic and political negotiation is embedded in dense networks of social interaction, incentives for opportunism, and consequently corruption, are reduced (Putnam, 1995). The above are important for entrepreneurs as they are not 'lonely individuals pursuing a personal vision, but also social agents situated within a wider system of production that can be represented as an actual and latent grid of interactions and opportunities in organizational and geographical space' (Scott, 2006, p. 7). Social and organizational networks could potentially provide many of the resources that new start-ups need and sometimes more quickly and more effectively than government-sponsored programmes (Sriram, Mersha, & Herron, 2007).

In the context of Smart Cities, the individual's social capital and trust needs to scale in terms of its extent and scope. Consequently, relational capital, i.e. 'all relationships (market relationships, power relationships and cooperation) established between firms, institutions and people ... with the strong sense of belonging and a highly developed capacity of cooperation typical of culturally similar people and institutions' (Capello & Faggian, 2005, p. 80) become crucial for urban development (Florida, 2002). Smart Cities grow by the conjunction of smart people and their relationships with each other. Smart people share the value of life-long learning, and an attitude towards flexibility, creativity or open-mindedness (Nam & Pardo, 2011). These attributes support the development of Smart Cities regarding finding solutions for problems that arise. Smart Cities depend on the strong participation of firms, institutions and citizens and their working together and building strong relationships for improvement and the development of modern working and living scenarios (Hollands, 2008). This co-working is also called 'democratic innovation' (von Hippel, 2005, p. 2) due to the decision making by numerous actors.

High-tech and Creative Industries

Knowledge networks and a highly skilled labour force in creative industries spur economic and urban growth (Florida, 2002; Winters, 2011). Their agglomeration in a Smart City fosters knowledge transfer and spillover effects (Kourtit, Nijkamp, & Arribas, 2012). Another important aspect for Smart cities is the geographical proximity of like-minded persons, also called a cluster or 'magnet for

creative people and workers' (Nam & Pardo, 2011, p. 285), with cases such as that of the IT industry in Silicon Valley being a prime example. The consideration of regional distinctions is relevant to understanding the entrepreneurial development (Fink, Lang, & Harms, 2013). Obviously, intensive exchanges between those individuals and at the same time mutual monitoring and a competitive environment create an environment that displays significant growth rates and high rates of creativity and innovation (Engel & del Palacio, 2011). At the same time, though, due to a large number of like-minded residents and entrepreneurs, a higher degree of competition is often to be expected (Nam & Pardo, 2011). Competition can result in innovations delivered at a faster pace, and Smart Cities are getting even smarter, due to a cluster effect (Glaeser & Berry, 2006).

Social and Environmental Sustainability

More than 50 per cent of the world's population already lives in cities or megacities (Goldstone, 2010), with the trends of migrating towards urban environments expected to continue. Smart Cities are expected to continue attracting citizens, intensifying their existing problems such as those related to pollution (cf., e.g., Mildenerger & Khare, 2000), traffic or waste management (Chourabi et al., 2012). Not surprisingly, the use of resources and the production of waste in cities is usually high (Gleeson & Low, 2000). Given that one of the key aims of a Smart Cities initiative is to strive towards achieving social and environmental sustainability, it follows that such initiatives have to take into account the scarcity of resources and put forward sustainable solutions (such as smart traffic systems). Social and environmental sustainability is crucial for Smart Cities in times of gaining wealth from increasing urban tourism and natural resources as 'their exploitation must guarantee the safe and renewable use of natural heritage' (Caragliu et al., 2011, p. 69).

Innovation and Entrepreneurship in Smart Cities

Within the dynamic and challenging innovation ecosystem of Smart Cities, entrepreneurs have to play an even more important role than usual in terms of identifying and exploiting opportunities (Shane & Venkataraman, 2000). Given the growing pressures, such as waste, traffic and pollution management, solutions are urgently required in order to ensure the availability of natural resources and the

renewal of the underlying infrastructure (Marceau, 2008; Toppeta, 2010; Chourabi et al., 2012). Entrepreneurs have to innovate by transforming ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace (Baregheh, Rowley, & Sambrook, 2009). Given the relatively narrow geographic localization scope for opportunity identification, development and exploitation, the choice of which Smart City to engage with can be an important one. Operating within Smart Cities, entrepreneurs may expect to reap a number of location-based advantages, such as competitively priced labour forces, access to critical resources, the possibility of developing new knowledge and capabilities (Bal, Lashari, & Nabavieh, 2014; Feldman, 2014). In addition, the expected access to venture capital may be a significant advantage for start-ups (Delgado, Porter, & Stern, 2010). Lee, Florida, and Acs (2004) also suggest that open-minded and creative regions attract human capital and this movement leads to a higher entrepreneurial dynamic. The role model for entrepreneurship and clustering is Silicon Valley, which has a mind-set and a business culture that fosters rapid introduction of innovation (Bresnahan, Gambardella, & Saxenian, 2001). Several success stories of collaboration in nurturing innovation to further business opportunities make the area even more attractive to entrepreneurs (Saxenian, 1990). The above can encourage the formation of (smart) clusters (Bender, Harms, & Rindermann, 2002; Pe'er & Keil, 2013). In turn, these can further fuel the development and growth of technology ventures. Once established, location-based advantages can lead to virtuous and self-reinforcing circles (Feldman, 2001). Establishing such virtuous circles can be a major milestone not just for underpinning the development of a Smart City initiative, but also for the wider success and prosperity of a city itself.

The six characteristics discussed above establish a distinct connection between Smart Cities and the fields of entrepreneurship and innovation as they provide the basis for new business opportunities. For example, the implementation of a high quality ICT infrastructure is attractive for high-tech-intensive businesses (Hollands, 2008). Additionally, the collected data, often so-called big data, offers new ways to discover and exploit an immense knowledge pool (Fan & Bifet, 2012). The 'socio-technical network' (Sauer, 2012, p. 63) among entrepreneurs within a Smart City is likely to stimulate knowledge spillovers and innovation. The availability of a high-skilled workforce in Smart Cities is typically above average

(Winters, 2011), offering particular advantages for economic development (Florida, 2002). Moreover, an increasing focus on sustainability has turned Smart Cities into an important economic factor with the need for more efficient services and applications. The above are in line with Scott's (2006) argument that geography is not simply a passive frame of reference, but an active ingredient in economic development and growth. Metropolitan environments can offer fruitful conditions for network behaviour, because of economies of density, suitable communication modes and associative cultures (Nijkamp, 2003).

In the following section, we discuss how these six characteristics were used as our conceptual framework, exploring the connection between innovation and entrepreneurship within Smart Cities. More specifically, our research questions are, firstly, to explore the ecological validity of the factors related to the development of Smart Cities and, secondly, to examine whether any other factors are of importance.

Methodology

We considered the analysis of the key ingredients of Smart Cities from the vantage point of entrepreneurs operating in them, in order to better understand the link between Smart Cities and entrepreneurship. More precisely, we studied specific characteristics of Smart Cities through the perspective of entrepreneurs who operate in them. As the study of Smart Cities reflects an infant research field (Tranos & Gertner, 2012; Richter et al., 2015), a qualitative case study approach was considered suitable (Gibbert, Ruigrok, & Wicki, 2008). A case study 'attempts to examine: (a) a contemporary phenomenon in its real-life context, especially when (b) the boundaries between phenomenon and context are not clearly evident' (Yin, 1981, p. 59). Yin (2009) stresses the importance of clearly defining the case to be investigated. In this study, the case of inquiry is an analysis of entrepreneurs operating in Smart Cities.

Data Collection

Data was collected through interviews with entrepreneurs who had founded businesses in Smart Cities. They were considered suitable participants for our work, as they had the necessary knowledge and experience with the topic under investigation. Since narrative interviews reduce the ability to exercise control during the interviews (Klenke, 2008) and group interviews, such as focus groups, have the adverse effect of not being able to discuss the

different aspects with every single participant (Morgan, 1996), we preferred semi-structured interviews. Although this mode of interviewing is flexible when it comes to the order of questioning and themes to be covered, the discussion is centred upon the research topic, which is introduced by the interviewer (Klenke, 2008). Consequently, semi-structured interviews were appropriate for our study, which involved exploring a number of factors, but also aimed at potentially identifying new ones.

An interview guide supported the interview process. According to Alvesson and Ashcraft (2012), a structured interview guide can increase the probability that the interviewees will respond to a specific research aim rather than information provided by the interviewed person. This also supports the collection of particular and determinable information. As both aspects are applicable to our goal to obtain specific, previously determined information plus the personal experiences of the entrepreneurs in Smart Cities, we considered an interview guide an appropriate method. Our focal themes were specified at the outset of the study. The content of the interviews focused on previous experiences in business in connection to the Smart Cities and on the motivations for foundation and frame conditions in particular. The six characteristics of Smart Cities as presented above were included as well. Given the exploratory character of our study, our procedure not only related to a deductive approach, but the guided interview approach also provided the basis for the inclusion of an inductive one. Therefore, the prior framing was supportive in coming close to the interviewees but was open to amendments and changes too.

Participants

Germany is a highly developed country with several Smart City initiatives and therefore serves as a useful analytical benchmark for the study of Smart City development. This offers an increased chance of arranging access to suitable informants. The study took place in three cities, namely Berlin, Cologne and Düsseldorf. Regarding possible participants, the authors were interested in selecting specifically those who were likely to shed light on the conditions for Smart City development. Thus, the sampling strategy applied was what Patton (2002) referred to as criterion sampling. This strategy of purposive sampling comprises the selection of cases that meet some predefined criteria. In doing so, the following approach was pursued. Firstly, possible

companies/entrepreneurs were identified by means of an online search. This resulted in 80 companies. Afterwards, each company was checked by the authors to ensure that a business relation to a Smart City was present. Disagreements among the authors were discussed and therefore companies were only included if the majority of the authors identified this specific connection. This proceeding led to narrowing down of our sample to 40 companies. As this study focuses on the specific conditions for entrepreneurship in Smart Cities, only the founders/entrepreneurs were suitable interview candidates. They were invited to participate in a personal video interview via Skype, a process that resulted in 12 interviews conducted between November 2013 and January 2014. Each interview lasted 45–90 minutes. Table 1 gives an overview of the interviewed entrepreneurs. As Eisenhardt (1989) identifies a saturation degree of newly gained knowledge at around one dozen interviews, we considered this number of interviews to be appropriate.

Analysis

All interviews were recorded electronically, then transcribed and coded. The codification started with the six characteristics presented in the literature section. This was then complemented with new codes that were derived from the interviews. These new codes were formed based on their frequency of occurrence. This procedure underlines the combinatory approach of using already existing information and expanding this with an exploratory approach (King, 2012). Therefore, new aspects, not yet covered by the existing literature, can be included in the analysis. To reduce any potential issues related to the subjective cognition of the interviewer, such as

the lack of objectivity, reliability and validity (Henn, Weinstein, & Foard, 2009), the authors created clusters/themes independently, and these were then jointly discussed. The discussions led to adjustments and refinements, until each cluster/theme was confirmed by the majority of the authors, helping establish a higher validity and reliability for the results (Yin, 2009).

Findings

Based on the interview findings, we explored a number of factors that were significantly related to innovation and entrepreneurship in the context of Smart Cities. Below, we present each of the factors separately before highlighting the various links among them.

Availability and Quality of ICT Infrastructure and Information Management

Our empirical evidence suggests that entrepreneurs consider the availability of ICT infrastructure almost as a given for a business location. This is especially true in highly developed countries, such as Germany, and in particular in the big cities. Interviewee 9 stated that 'high usage and quality of Internet connection in all highly developed countries are similar, so no advantages can be generated here', while Interviewee 3 emphasized, 'ICT infrastructure is more of a basic requirement for us. We would not have founded the company in this city, if this requirement had not been provided, enough alternatives exist in Germany'. Consequently, the availability of ICT infrastructure does not offer a competitive advantage to a location distinguishing one city from another, but rather acts as a commodity and a baseline (Carr, 2003).

Table 1. Overview of the Participating Companies/Entrepreneurs

No.	Industry	Main product	Employees	Established
1	Transportation services	Application	5	2012
2	General services	Coding of applications	9	2011
3	Transportation services	Application	20	2012
4	Mobile marketing	Application	13	2009
5	Transportation manufacturing	Electronic conveyance	60	2009
6	Sustainability services	Consulting	2	2011
7	Local retail services	Platform	6	2013
8	Sustainability services	Application	3	2011
9	Urban development services	Consulting	24	2012
10	Energy service	Services	15	2012
11	Mobile marketing	Application	7	2012
12	Transportation services	Application	3	2011

On the other hand, the quality and capacity were deemed of special importance and relevance for entrepreneurs, especially those whose main product or service depended on reliable infrastructure. For instance, Interviewee 4, a provider of an application for smartphones, stated that quality and capacity were 'very important, as the app is reliant on data volume and usage'. It was also found that there are major differences between urban and rural areas: 'Unfortunately ICT is not as developed as one would like. The moment you leave a built-up area, the Internet connection is gone' (Interviewee 6). This statement illustrates how infrastructure can limit the transferability of services and solutions from one place to another, as business models are highly dependent on it.

When it came to information management, the interviewees' answers reiterated a similar point, i.e. that the recording, preparation, analyses and availability are not even close to the much-quoted buzzword of 'big data' (Interviewees 2, 6, 9, 10, 11). Each stakeholder (like the government or firms) has developed proprietary databases that are used for internal needs, and will not open them up, or only in very few exceptional cases (e.g., Interviewee 3). As Interviewee 2 put it: 'The big picture is still missing. So far it is piecemeal. No one wants the driver's seat'. The high attention on data security and privacy fosters the establishment of barriers for citizens to actually take part in a smart, ICT-based development. Interviewee 7 stated on that matter, 'The NSA is nothing, we will know everything, albeit anonymized, but we will know how many people are where and so on. That is dangerous on the one hand, amazing on the other.' Also, following on from the previous point related to transferability, this can be further limited by the proprietary nature of information sources that may not be compatible with similar ones in other places, which in turn raises compatibility issues and increases complexity.

Business-Led Urban Development

Our empirical evidence suggests that the spirit of Smart Cities, in terms of a growing business sector, is not of fundamental relevance for entrepreneurs. Instead, it fosters the atmosphere and the willingness to take part in such a development. In this context, some interviewees (e.g., 3 and 12) emphasized the relevance of city planning, with the need to manage and structure such a development by the public sector. Our participants expect the city to control the development in such a way that clusters are created for different business

sectors. Consequently, the city itself appears to take the role of an essential lever that contributes to the success of a city by actually having a smart development and thus being a Smart City. This is perceived as important as the entrepreneurs regard closeness to related businesses as beneficial: 'What is nice in Cologne is that there are many like-minded people. You meet up regularly and sometimes even live in the same building' (Interviewee 6). Still when it came to networking, the interviewees were sceptical about its benefits:

For pure networks and exchanges you have to make sure that you don't forget your actual job. And I've yet to actually pay a price for networking. (Interviewee 8)

Social meeting point: 'We can't network the entire time'. They don't want to be a typical start-up, and in the foundation phase spend a lot of time with other founders in Berlin and elsewhere. But they find continual networking time-consuming and not very effective. They still have a friendly relationship with other start-ups, though, and also use the small scene in Düsseldorf, as contacts can more easily be made there. (Interviewee 4)

Our findings also suggest that a clear distinction needs to be made between the different kinds of factors making a city attractive from an entrepreneur's point of view. For example, on Berlin, Interviewee 3 said, 'The phenomenon of the business angel isn't really there in Berlin. Everyone heads there because it's hip and cool, but no-one can name any clear advantage.' The presence and initiative of the public sector is regarded as less efficient as this often means more bureaucracy from the viewpoint of the interviewees. For instance, Interviewee 10 stated that, 'Founder-friendly cities are an advantage, but the friendliness ends where the bureaucracy starts' (Interviewee 10).

Social Inclusion of Urban Residents in Public Services

Our analysis suggests that a city's residents are not included in its 'smart' development, according to the comments of our interviewees. Most of them appear not to be aware of the possible benefits that can be offered by a more efficient and therefore smart development of their environment and the businesses and entrepreneurs active in it. So far, residents have been in a consuming position: they demand new solutions and force entrepreneurs to create innovative applications which they can

use later on. The impact of residents on the creation of new, innovative solutions has not been felt yet. However, the interviewees would appreciate a more active inclusion.

Not essential, but important, is a high level of affinity among the residents, as then the step to other innovative points such as the E-Roller isn't far; customers are mostly older, which certainly lies in the high-quality product. But they think about not destroying the environment themselves; Munich is an interesting city with many leisure options. (Interviewee 6)

Interviewee 11 suggested that 'social inclusion is an important factor for them, so that they use the app and also feel responsible for the city; this means people from Düsseldorf stand behind their city'. This statement shows that in the case of two or more similar products, the local factor is in the end the decisive factor for use or non-use. Consequently, residents play an important role in the city's development and the preservation of its offerings. The disadvantage on social inclusion is the point that there is no chance to control or even optimize it with a solid plan (Interviewee 10); it is more than enthusiasm, pleasure or consternation (Interviewee 4). 'Social inclusion is very, very important for our business, but we are dependent on a soft force which is almost uncontrollable. But, we recognize a steadily growing market due to higher awareness of sustainability.' This feeling leads to more potential customers, but none of the interviewees could give a concrete example of fostering enthusiasm for and encouraging higher social inclusion. Smart Cities promote the open exchange of data and information. This is also reflected in the behaviour of the app users (Interviewees 1 and 4). Openness and transparency are necessary for common work. Interviewees 11 and 12 even noticed the beginning of a social movement.

High-tech and Creative Industries

The existence of high-tech and creative industries was expected to contribute to the brand and external image of a city. However, our evidence suggests that from an entrepreneur's vantage point this plays a minor role only. Only Interviewee 3 perceived it as important, as the company used their close relation to a university for networking and the recruiting of staff. In that case, the university provided a study subject focusing on innovations and entrepreneurship. Other high-tech and creative industries, especially if represented by larger companies, are seen

more as competitors rather than as potential business partners. This shows that there is no automatic link between existence and usage. Indeed, this situation hints at some tensions that discourage the entrepreneurs from engaging with the high-tech and creative industries. Maybe there is a feeling that one is not treated as an equal (Sauer, 2012).

Creative industry is sometimes very important; during our foundation we paid close attention to the university having a large IT and economics faculty. At the beginning they went to the university and the exchange with other students was very important for them. At the same time they now always have access to IT experts and web designers. (Interviewee 3)

We use the higher education institutes as a platform for network-building, introduce companies and careers in entrepreneurship comparative literature and so meet new entrepreneurs. (Interviewee 4)

Looking more closely at the cluster aspect, it is found that innovations benefit from each other and make the original product or process even better. 'Without the inspiration of my flatmate's (who is working for a service provider outside his own industry) idea, I would never have optimized my own App' (Interviewee 3). Typically, it is not the copy-cat phenomenon, but the demonstration of alternative ways and solutions. 'I know I had to address the user in a different way, but the "how" was hidden from me ... until a demonstration of an app, completely outside of my own field, at an informal network meeting' (Interview 1).

Role of Social and Relational Capital

The interviewees regard social and relational capital as a stimulus for their own business activities, creation and further development of their ideas.

Social meeting point: an intensive exchange is nurtured by the company not only briefly after the foundation. As before they sit together with 20 other young companies and use the spatial proximity for an exchange on aspects of marketing, bureaucracy (accountant recommendations) or the products themselves, as you receive neutral feedback from the other founders. Different experience among the other founders results in varied information possibilities. (Interviewee 2)

Especially in the process of business formation, the support of more experienced entrepreneurs is seen to overcome barriers of inexperienced ones, as suggested by the younger entrepreneurs surveyed (Interviewees 3, 4, 6). On the other hand, the closeness to other entrepreneurs is not always viewed as something positive, comparable with inspiration from outside the industry, business angel contacts or even motivation speeches: 'Networking is nice, especially when we founded our company, but more importantly we need to focus on our own idea and its development. Networking takes a lot of time and effort' (Interviewee 12). Referring back to the earlier discussion of networking, Interviewee 12's statement reveals the difficulties faced by entrepreneurs in balancing the benefits of relational capital with the costs involved in its maintenance.

Interviewee 11 explained social capital in a different way. He believes it is important for young people who do not know how to write a business plan. As an experienced advisor and strategist, it is not important for him. He also believes that people mostly get in contact first of all with people they know rather than those close to them, and the relevance of social exchange for problem-solving is declining and outdated. The significance of social (Nahapiet & Ghoshal, 1998) and relational capital (Kale, Singh, & Perlmutter, 2000) depends on personal experiences, personal education level and the personal network environment. The entrepreneur will face different issues and challenges over his or her career, so the benefits of social and relational capital can be interpreted as more important in different stages.

Social and Environmental Sustainability

Sustainability is regarded as an essential aspect, which has been of increasing importance. A contribution to the social and environmental sustainability of the city is an objective most of the interviewed entrepreneurs pursue. They often put more emphasis on social and environmental sustainability than profiting financially. For example, Interviewee 4 declared that sustainability is the core of his business. They choose products with quality and fairness and use bike couriers (the company use electro cargo bikes); the company pays a fair price and encourages customers to name the price for the product that they genuinely need to receive. They do not want to be in the role of a teacher, but to limit price wars. Similarly, Interviewee 3, who runs a parcel service, mentioned using e-bikes. The above does not imply that personal financial sustainability does not

matter, as Interviewee 11 succinctly put it: 'This is an opportunity to make a quick buck – no question. To be at the front would be amazing.'

A question that arises is whether the focus on sustainability emanated from the entrepreneurs' attitude or whether, driven by the commercial opportunity, they found themselves adopting sustainable practices more widely. For instance, following the example about transportation above, the informants stated that they prefer public transportation to private car rides. Was this a case of the corporate ethos permeating into their personal attitudes or vice versa? Our data suggest that when it came to the motivations of founding a new business, they were primarily interested in realizing their own ideas. 'I do it out of conviction, I experienced the demand at first hand' (Interviewee 1) or 'The product is exciting, start-ups are exciting. I'm only doing it for myself – then I'll look for something for me' (Interviewee 12). Our evidence suggests that the Smart Cities context did not influence the entrepreneurs' motivations and consequently there was not much difference from pursuing opportunities in different contexts.

A specific attitude towards values (openness, trust, fellowship) allows digital innovation in Smart Cities with the goal of sustainability. 'Sustainability is coined by the factors social, environmental and economic – but we focus on social and environmental' (Interviewee 10). In particular, the concept of sharing was very important to the entrepreneurs. It is the lived principle of give-and-take. Goods, experiences, ideas or money are shared with the aim of helping each other, supporting each other (Interviewees 8 and 9).

Government-Led Development and Support

From the interviews it was clear that a standard definition and view of what a Smart City was about did not exist in the minds of the entrepreneurs. A couple of them had never even heard of it (Interviewees 10 and 12). For those who were familiar with the term, it was regarded as a pool for innovative ideas and products, but contrastingly also as a term with no significant meaning and more of a 'buzzword' created by the city for marketing reasons. Interviewee 6 stressed 'You have to be careful not to overuse the term, like Smart Meter or Smart Home'. According to the interviewees, no pivotal strategy is transparent or has been communicated by the public initiators. Consistent support or consulting did not exist. The statements by the interviewees suggest that the cities and their governments themselves

have not fully understood the whole concept yet, as controlling and managing aspects of the networked city are not covered. The above can be summarized vividly in the quotes by Interviewee 2 who stated 'No-one knows exactly what's behind it' and that of Interviewee 3 who said: 'All talk, but no substance'.

The lack of a coherent vision and mission and, in turn, a plan as to how to operationalize these, made entrepreneurs feel that the government did not provide the necessary support. According to them, governmental support can be divided into administrative and financial subsidies. The interviewees miss suitable support from the administrative institutions: 'The city administration is unable to support us either intellectually or in terms of capacity. They only open hairdressers' (Interviewee 10). Qualified staff able to evaluate the business ideas seem to be missing. Additionally, according to the interviewees, the administrative processes are time-intensive and too slow. Cities or governmental financial institutions are not prepared to (financially) support business ideas of entrepreneurs within a Smart City. The business ideas of many of the interviewees are too abstract for the staff in charge and do not offer enough collateral or calculable benefits to justify an investment.

When it came to the financial support, even though subsidies for projects in Smart Cities exist, the findings indicate that the entrepreneurs try to act independently, since an application for such subsidies is connected to too much effort in relation to the possible benefits. Additionally, it was mentioned that there is the impression that only particular companies receive financial support for no observable reason. This finding suggests that the application for public funding and the decision process need to be restructured towards a more transparent, simplified and faster direction. The government also needs to maintain control over the granting of funds in order to minimize the risk of exploitation by specific companies only.

Financial support for entrepreneurs or specific initiatives did not exist. Instead, training is adapted to the needs of founding hairdressers. Entrepreneurship seems to be regarded more as a science by the initiators, leading to a missing willingness to invest and take a role in the city's development, as expected by the interviewees.

Despite the above, the entrepreneurs believed that Smart Cities will become of more importance in the future. 'I think we can't start to imagine what will happen' (Interviewee 10). The interviewees named exchange, the linking of information and processes, sharing of goods,

services and knowledge as essential elements, which are expected to shape the future of Smart Cities. Thereby as application areas, these developments will go beyond energy, transportation or IT, potentially extending to politics, welfare, communication and health. The focus on sustainability and efficiency, social interaction and high transparency are considered essential in the future, especially as cities will grow immensely on a global level. The Smart Cities project is also expected to help strengthen innovations in highly developed countries such as Germany.

Smart Cities will become very important, as they consider many aspects. The focus must be set and anything that lies to the left or right exterminated. (Interviewee 1)

Smart Cities will be pushed by the state, companies and also individuals – that is its strength. (Interviewee 10)

Discussion

Our study aimed to explore the views of entrepreneurs operating within a number of Smart Cities in Germany. Our first objective was to probe the views of the participants on the six key factors identified in the literature. We have found strong support for availability and quality of ICT infrastructure and usage, business-led urban development, social inclusion of urban residents in public services, the role of social and relational capital, social and environmental sustainability as well as partial support for closeness to high-tech and creative industries. The first factor related to the availability and quality of the ICT infrastructure was considered to be of fundamental importance for entrepreneurs in Smart Cities, as their business idea and activities depend on an intense use of the Internet and available data. The remaining five were seen as favourable conditions with only secondary influence. We have also added a new factor to our list, namely governmental led-development and support. We summarize the evidence from our interviews in Table 2.

We also considered the interlinks among the factors identified and in turn how these may encourage and facilitate entrepreneurship in the context of Smart City development. The first point to note is that, although large cities typically have the ingredients discussed in the previous section, their amalgamation into a coherent Smart City vision is not a simple matter. This could be seen in the entrepreneurs viewing 'Smart City' as a buzzword without much substance (Interviewee 2). The vision

Table 2. Summary of Findings

Characteristic	Support	Evident in firm
Availability and quality of ICT infrastructure and information management	Supported	1–12
Business-led urban development	Partly supported	1, 10–12
Social inclusion of urban residents in public services	Partly supported	1, 3, 5, 7, 9, 12
Closeness to high-tech and creative industries	Supported	1, 2, 4, 9–12
Role of social and relational capital	Supported	1, 2, 4, 6, 9–12
Social and environmental sustainability	Supported	1, 2, 4, 7–12
Government-led development and support	New-supported	1, 4, 6, 7, 10–12

needs to be clearly communicated to potential entrepreneurs, so that there is a sense of direction, which will ensure that scarce resources are invested in areas of priority for which there is demand. Demand would have ensured the sustainability of any new venture in the first instance. This is of importance as entrepreneurs perceive the market scope of Smart City innovation limited to the city boundaries due to the challenges of transferring solutions from one context to another (e.g., Interviewee 12). On that front local governments could play an important role in terms of creating and fostering a culture of innovation that would attract both the interest of their citizens but also the creative talent of entrepreneurs. In other words, they could help set the agenda and act as a catalytic factor and conduit for entrepreneurs to meet citizens' demands.

Managing the soft side well is as important as the technological solutions to the challenges faced. For instance, the availability of robust and reliable ICT infrastructure was not perceived as an issue by the entrepreneurs, who considered this a given for big cities (all interviewees). With technology improving over time and becoming more affordable, it follows that all cities could have the potential to become smart ones and differentiating one from another could become more difficult. In such a case why would an entrepreneur decide to start up in one city and not another? The Smart City vision may partly answer this by offering directions that are more specific as to what kind of smart city the local government envisages it wants to become. For example, the city could offer incentives for solving problems in specific areas that could help attract a critical mass of interest around them. This will not only maximize the chances of coming up with tangible and sustainable solutions, but also create a more focused creative cluster of entrepreneurs interested in smart solutions. Such a cluster could be more useful than having a generic

creative cluster or a university nearby, accelerating knowledge spillovers and collaborations (Interviewees 1, 2, 4, 9–12). The city could also encourage collaboration as opposed to competition among entrepreneurs, supporting them to export their solutions to other cities. This could involve playing a facilitating role, as opposed to offering subsidies (Papagiannidis, Li, Etkowitz, & Clouser, 2009). Effectively the city could adopt a smart specialization strategy (Carayannis & Rakhmatullin, 2014; McCann & Ortega-Argilés, 2015) and then potentially aim to export its outcomes. Such a strategy will further motivate and focus entrepreneurs as it will help maximize the scope and impact of their smart solutions. It would also help address the entrepreneurs' perceptions that the city with its administrative processes and structures is the main barrier for entrepreneurship in Smart Cities (e.g., Interviewee 1).

As a next step, our intention was to bring together the seven characteristics with the three key stages of the entrepreneurial process (i.e., opportunity identification, opportunity development, and exploitation) (Table 3). Opportunity identification refers to the discovery of a business idea, which may be made or found (Harms, Schulz, Kraus, & Fink, 2009). Opportunity identification and selecting the right opportunities are crucial for entrepreneurs (Stevenson, Roberts, & Grousbeck, 1985). Opportunities are the chance to meet the market needs (or its interest or what it wants) (Ardichvili, Cardozo, & Ray, 2003), which happens through a creative combination of resources that deliver superior value (Schumpeter, 1934). Social capital and the ability to connect with residents can be catalysts in terms of identifying key problems that need addressing and in turn could become viable businesses. Residents can not only help in identifying ideas, but also potentially propose or help shape solutions. The issue of social and environmental sustainability is a potential

Table 3. Mapping the Seven Characteristics on to Opportunity Identification, Opportunity Development and Exploitation

Characteristic	Opportunity identification	Opportunity development	Exploitation
Availability and quality of ICT infrastructure and information management		X	X
Business-led urban development		X	X
Social inclusion of urban residents in public services	X		
Closeness to high-tech and creative industries		X	
Role of social and relational capital	X		
Social and environmental sustainability	X		
Government-led development and support		X	X

source of ideas as tackling such challenges lies at the heart of Smart City development.

The next stage, opportunity development, includes the evaluation of the business opportunity, which could also result in new opportunities or the adaptation of the original idea. This process is cyclical and iterative. This stage involves creative work, which is needed to develop a viable business (Ardichvili et al., 2003). For the above to happen and for ideas to be developed beyond prototypes, having the necessary environment in place is imperative. This also applies to the existence of a creative business ecosystem that can facilitate and encourage not just the development of the relevant technical aspects but of the business ones too, for example in terms of developing a sustainable business model (e.g., Fellnhöfer, Kraus & Bouncken, 2014). Finally, exploitation refers to the realization part of the entrepreneurial process, the concrete steps that are needed to realize the business idea (Davidsson, 2012). This stage could be described as the one during which the market needs are satisfied (Venkataraman, 1997) and the monetization takes place (Hansen & Birkinshaw, 2007). At this stage, government-led development and support can help ideas not only to develop, but also to scale so that they can become financially viable in the longer term.

Conclusions and Future Research

In this article, we embarked from a set of factors identified in the literature as related to Smart City development. We have explored their applicability from the vantage point of 12 entrepreneurs operating within Smart Cities in Germany. We also refined them and extended them by adding a relevant extra factor. Overall, our findings suggest that entrepreneurs believe that Smart City initiatives need a clear vision

to drive their development and growth and that local government has a key role to play in bringing the necessary resources and stakeholders together. The topic is 'in vogue', but needs a holistic strategy (Grichnik & Harms, 2007). Given the relatively small number of entrepreneurs taking part in our study, the applicability of our findings to other contexts is limited. Future research taking place in a different geographical setting with its own characteristics, challenges and opportunities would be welcome, as it will help put our findings into perspective. Differences between more and less developed countries should be further taken into account. The above could potentially help not only test the already identified factors but also add new ones. More in-depth and holistic studies that examine these factors simultaneously from different stakeholder perspectives could produce interesting insights as to the development of Smart City initiatives. Another option for future research could be spatial statistics (e.g., Breitenacker & Harms, 2010) to discover unknown Smart City areas.

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Publication V

Richter, C., Brem, A., Kraus, S., Durst, S., and Gieselbrecht, C.

**Innovative Business Models for the Shareconomy: An Exploratory Study of 14
Entrepreneurs from the German-speaking Countries**

Under Review

Creativity and Innovation Management

INNOVATIVE BUSINESS MODELS FOR THE SHARECON- OMY: AN EXPLORATORY STUDY OF 14 ENTREPRENEURS FROM THE GERMAN-SPEAKING COUNTRIES

Abstract

“What’s mine is yours”: An increasing number of people participate in sharing and exchanging information and knowledge, data, and goods. As research addressing the so-called “shareconomy” is still in its infancy, this article aims to shed light on the connection between entrepreneurial activities and shareconomy. The central research questions is “What circumstances affect the entrepreneur in his business activities in the field of shareconomy?”. For this purpose, a qualitative research approach comprising guided interviews with 14 entrepreneurial companies from Germany, Austria, and Switzerland, provides detailed insights into different aspects of shareconomy. Our results show the direct contribution of the shareconomy to entrepreneurship, especially regarding business models of start-ups. However, we find a strict separation of the business approach from the social approach that seems to be in higher demand among the customers than among the entrepreneurs. Under the umbrella of an increased digitalized work and life environment, a combination of these factors leads to a changed living situation (urbanity, openness for new solutions, changed working situation, new mindset). The results led to an expansion of the goals of shareconomy: creating of and participating in *added value* and being a component of a *real win-win situation*.

Keywords: shareconomy; digital entrepreneur; entrepreneurship, start-up; opportunities; niches, qualitative research; specific fields of action

1 Introduction

The spread of digital systems in most areas of today's life has contributed to the emergence of large amounts of information. Through the interconnectedness of these systems, new and diverse scopes of actions have occurred – as for example the development of a more sustainable society (Trumm et al., 2013, p. 54; Hamari et al., 2015). Following the principle “What's mine is yours”, an increasing amount of people participate in the sharing and exchanging of information and knowledge, data, and physical goods (Botsman & Rogers, 2011). Sharing common resources is facilitated through the Web 2.0 as it provides structures for online platforms promoting business models for swapping, sharing, and lending (Trumm et al., 2013). Therefore, sharing can be regarded as an outcome of “the digital revolution, from Web 2.0, from social networks, from the generation of ‘digital natives’” (Grassmuck, 2012, p. 18) and is already considered as an successful business model in the economy of fully access to the world wide web (Denning, 2014).

Prominent examples of such sharing behaviors are services like “Uber”, “AirBnB”, and “Wikipedia” (Richter et al., 2015) – classic business models transferred into the new era of digitization. Whereas “Uber” changes the traditional cab services, “AirBnB” provides an alternative for hotel or apartment bookings and “Wikipedia” replaced the classical encyclopedia. Access to the Internet and a certain number of users to match supply and demand through digital platforms (so called intermediary) constitute the foundation of these services. Successful new businesses based on the idea of sharing are expected to facilitate a shift in consumer behavior from private to shared ownership, resulting in fewer purchases and therefore threatening established business models (Belk, 2014). Several authors (e.g., Dierig, 2013; Grassmuck, 2012; Kempf, 2013) anticipate the market to grow enormously, contributing to its economic attractiveness. In fact, the sharing services sector is forecasted to become a \$110 billion-plus market in the near future (Sacks, 2011) and hence offers a great revenue potential for entrepreneurs.

This radical approach of changing old-established and conservative business models and re-arrange the parameter in a new way, corresponds with the traditional entrepreneurial teaching by Schumpeter (Schumpeter, 1934). His idea of creative destruction coined entrepreneurship, which is also defined as occupying niches (Wiklund, 1998), monetizing business opportunities (Zott et al., 2011), as well as being innovative (Gartner, 1990), radical (Lassen et al., 2006), and risk-taking (Palich & Bagby, 1995). Limited resources (e.g., time, money, human resources) force entrepreneurs to be different, more conspicuous, and solution-finding-oriented (McDougall & Oviatt, 2000).

Thus, the idea of sharing seems to be closely connected with entrepreneurship, and also requires modern information and communication technology (ICT). Consequently, entrepreneurs with activities in the shareconomy can be described as “digital entrepreneurs” making use of modern ICT in order to create business opportunities (Segui, 2010). In this regard, collaborative IT can be of high value as it has been found to support high levels of interaction, as well as communication and information sharing among large groups (Karsten, 2003).

As research addressing the new way of sharing is still in its infancy (Katz et al., 2014), this article aims to shed light on the connection between entrepreneurship and shareconomy. The main focus of this paper lies on exploring the relevant conditions for entrepreneurs. Specific fields of action have to be found in order to ensure a practical approach. A qualitative research approach comprising guided interviews with 14 entrepreneurial companies from Germany, Austria, and Switzerland, provides detailed insights into different aspects of sharing. In this context, the question whether about an appointed hype or a serious business model behind the idea of shareconomy is analyzed.

The remaining part of this paper is structured as follows. First, the theoretical background provides a

definition of the shareconomy on the basis of several academic publications and elaborates on different dimensions of shareconomy and gives an idea of already discussed frameworks and conditions. Second, the subsequent methodology describes the data collection process, participants, and the analysis. Third, findings from the guided interviews are presented within several categories followed by a discussion of results. Finally, the conclusion provides a summary of relevant findings and considers limitations as well as future research directions.

2 Theoretical background

While the term “Share Economy” was coined by Weitzman (1984), the phenomenon of sharing economy, or “shareconomy”, as it is most commonly written nowadays, is rather new. Other recent phenomena, such as “peer economy”, “collaborative economy” and “collaborative consumption” are often not clearly distinguished from shareconomy, revealing a lack in consistent definition (Botsman, 2013). Sharing, i.e. the “the act and process of distributing what is ours to others for their use as well as the act and process of receiving something from others for our use“ (Belk, 2014, p. 127), constitutes an alternative to private ownership and includes the voluntarily lending, pooling, and allocation of resources (Demsetz, 2002, p. 248). In light of the recent economic crisis, increasing environmental concerns and the maturation of the social web, the idea of sharing has created a new generation of business models (Sacks, 2011). Shareconomy is a technological approach with sustainability promise and can therefore be considered as a strategic niche in the field of sustainable innovation (Schot & Geels, 2008). Due to the infancy stage, setbacks and even the end of this niche approach, due to a lack of sufficient momentum, are possible (Kemp et al., 1998).

Bendel (2014) defines shareconomy as the systematic lending and borrowing of objects, especially through private individuals, which is in line with the definition given by Botsman (2013), identifying this phenomenon as an economic model in which individuals share underutilized assets for monetary and non-monetary benefits. Recke (2008) points out the important role of the Internet and its generation of an independent economy of sharing. Supporting this view, Belk (2014) emphasizes the Web 2.0’s influence in creating various new ways of sharing as well as facilitating older forms of sharing. Drawing from these definitions, we define the shareconomy *as an economic model enabled and facilitated by the Internet and Web 2.0, in which users systematically share underutilized assets for monetary or non-monetary benefits*. Consumers leave their traditional role and transform into “micro entrepreneurs” (Balck & Cracau, 2015, p. 1) or “prosumers” (Rathnayaka et al., 2014, p. 41); the distinction between production, trade, and consumption is softened.

Considering shareconomy in context of entrepreneurship, strong overlaps can be seen. As already mentioned, occupying niches is part in both aspects (Kemp et al., 1998). Being innovative and finding so far unknown paths (Gartner, 1990), breaking rules (Brenkert, 2009), and replacing old business models (Osterwalder & Pigneur, 2010) are also common components. Entrepreneurship is strongly linked with the ability of identifying business opportunities in the environment and the matching of “the propensity to enterprise, and the ability to enterprise” (Gnyawali & Fogel, 1994, p. 54). Further entrepreneurial drivers are named by “creativity” or the ability of “independent thinking” (Binks et al., 2006), “leadership”, and “strategic planning” (Vesper & Gartner, 1997, p. 403), just to mention a few.

Disruptive innovation (Christensen et al., 2008) is one description of shareconomy, not only improving the existing business models but creating it in a complete different way (Balck & Cracau, 2015). In this specific case the availability of digitalization and ITC supports the radical changes. Therefore, it is surprising that very rare literature is available about the link between shareconomy and entrepreneurship. Though the connection between shareconomy and entrepreneurship is given, the literature and research are not up to date.

Due to a lack of several frameworks and missing controversial dispute and optimization of existing frameworks, the framework of shareconomy by Kempf (2013) serves as a first orientation and will be challenged in this article. According to Kempf (2013), digital entrepreneurs have the option to engage in three different dimensions of the shareconomy, namely 1) the sharing of digital content (e.g., Belk, 2014), 2) the sharing of physical goods (e.g., Möhlmann, 2015), and 3) crowdfunding (e.g., Sahn et al., 2014). The setup of this article follows the structure given by Kempf due to the subsumption of several aspects of shareconomy in one single work (compare Weishaupt, 2015). The following paragraphs assess these dimensions in more detail and discuss relevant examples of entrepreneurs leveraging on modern ICT to build successful businesses based on sharing.

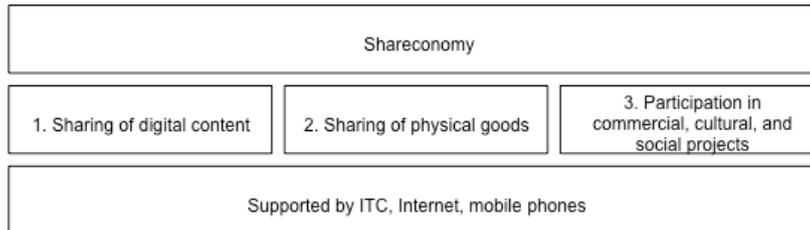


Figure 1 Shareconomy Framework by Kempf (2013)

1. Sharing of digital content and entrepreneurship

The origins of the shareconomy can be found in the sharing of digital content (Shapiro & Varian, 1998), which did not require a physical medium any longer, but rather peer-to-peer (P2P) models such as networks (e.g., BitTorrent, Limeware, Kazaa, eMule) or file sharing that enables the distribution, circulation, and reformatting of any digitalized content (Castells, 2011). In addition, mobile clouds (Katz et al., 2014; compare Sultan & van de Bunt-Kokhuis, 2012), online platforms, blogs, and other forms of social media provide a possibility to create, share, and distribute content online (Mullan, 2011).

Sharing of digital content offers favorable conditions for entrepreneurs due to digitalization, enabling the unlimited copying of digital data or objects without any material costs or loss of quality, and with only a minimum of effort (Unger, 2012). Despite high creation costs, the costs for content reproduction are substantially lower and because of no physical abrasion, digital content is more durable than physical goods (Seidenfaden, 2006). Entrepreneurs do not need to access large sources of capital and exert influence on gatekeepers when attempting to reach large audiences with their information (Hargittai & Walejko, 2008). Additionally, they are able to realize economies of scale due to the simple reproduction process (Seidenfaden, 2006). On the other hand, the sharing and distribution of digital content provides some hurdles for entrepreneurs. Based on the unlimited capacity, economic rules for price determination do not hold and digital content should be available at no cost. Furthermore, data protection and copyright issues pose additional challenges to business owners (Seidenfaden, 2006). Even independent currencies arise on the basis of peer-2-peer approach (Carroll & Bellotti, 2015).

A prominent example of a successful business models in this first dimension of the shareconomy represents Dropbox, a free cloud storage solution of up to 2 GB of data for private consumers and companies (Carney, 2013), whereas signing up new users or subscribing to the paid service for a monthly fee generates additional data storage (Quick & Choo, 2013).

2. Sharing of physical goods and entrepreneurship

The business model of sharing physical goods, such as bikes (e.g., Paul & Bogenberger, 2014), cars (e.g., Schiederig & Herstatt, 2014), and accommodation (e.g., Airbnb) is facilitated by the digitalization and is experiencing an increasing acceptance by consumers (Kempf & Pörschmann, 2012). Physical goods are tradable on markets, their production requires specialized knowledge (Parry et al., 2011), and investments and their quality decreases over time due to physical abrasion (Seidenfaden, 2006). According to Punsri Abeywickrema, founder of the renting platform “Rentalic”, physical goods that are suitable for sharing should be infrequently used, easily transportable, and have a value between \$100 and \$500 (Sacks, 2011). The high expected growth rate in this second dimension of the shareconomy makes it a very attractive field for entrepreneurs (Kempf, 2013). However, as the production of physical goods is rather costly (Seidenfaden, 2006), entrepreneurs should pursue business models providing infrastructure for sharing and trading, making ownership of physical goods obsolete. However, a lack of legal bases for user protection (Gerom, 2013) and clear operating guidelines (Hoge, 2013) constitute some obstacles for entrepreneurs in this field.

While the earliest marketplaces, such as “CouchSurfing” and “Freecycle” supported a free sharing of goods, the more recent business models are oriented towards commerce (Sacks, 2011). “Airbnb” constitutes one of the best-known examples of this phenomenon (Gerom, 2013). Following a broker’s model, it connects users demanding affordable accommodation with hosts in 8000 cities (Sacks, 2011) and offers a booking process, payment handling, and customer support. In exchange, travellers pay a fee between 6% and 12% of the total price and hosts are asked for 3% of their revenues, making it an extremely successful business model (Gerom, 2013).

3. Participation in commercial, cultural and social projects

Crowdfunding can be defined as an initiative in which an individual raises capital by asking a crowd of people to provide small to medium-sized investments for a project or start-up business through an online platform (Agrawal et al., 2014; Tomczak and Brem, 2013). Consequently, the project initiator is less dependent on his own financial resources and does not need to meet any essential requirements (Estellés-Arolas & González-Ladrón-de-Guevara, 2012). The entrepreneur, however, is obliged to reward the crowdinvestors in form of monetary benefits or with shares of their business or project (Pelzer et al., 2012). Offering an intermediary provider of an infrastructure and platform is a second advantageous business model for entrepreneurs in this dimension of shareconomy. Stors and Kagermeier argue that the phenomenon of shareconomy is an “existing trend in society, rather than a cultural turnaround” (2015, p. 3) or even a “paradigm shift” (2015, p. 3). This point is evaluated differently, e.g. Katz et al. call shareconomy explicitly a “novel trading paradigm” (Katz et al., 2014, p. 63).

The crowdfunding platform “Kickstarter” serves as a prominent example, bringing together project initiators and contributors, without claiming ownership of the projects. After the successful funding of a project, the platform applies a 5% fee to the total amount of funds collected (Strickler, 2014), allowing it to collect approximately US \$20 million revenue in 2013 (Popper, 2013).

3 Methodology

3.1 Research approach

In order to study the phenomenon of the shareconomy and its possible opportunities and challenges, we chose the perspective of entrepreneurs concerned. As the study of the shareconomy represents an infant field of research (Richter et al., 2015), a qualitative research approach was considered a suitable approach (Creswell, 2012). As researchers can get closer to informants, a qualitative approach was expected to provide a better understanding of how participants saw the world around them (Henn et al., 2009). More precisely the study followed an interview-based approach. The aim of this study was to identify the current conditions for entrepreneurs in the field of shareconomy, to challenge condi-

tions taken from the current scientific literature and to identify specific areas of action. The concrete research question is: “What circumstances affect the entrepreneur in his business activities in the field of shareconomy?”. This article offers the first chance to analyze shareconomy in a qualitative approach.

The data were collected by the means of semi-structured interviews. This type of interview is suitable when the planned study comprises an exploratory element (Saunders et al., 2009). Additionally, this mode of interviewing can generate new perspectives and questions and at the same time facilitate “an easier sorting, comparison and analysis of the material” (Alvesson & Ashcraft, 2012, p. 248). An interview guide supported the interview process. According to Gläser and Laudel (2010), a guided interview is suitable firstly, when the content of the interview is based on a specific research aim rather than on information provided by the interviewed person, and secondly, when single, determinable information should be collected. Since both aspects are applicable to the present study’s purpose, an interview guide was considered an appropriate method. The focal themes of interest were specified at the outset of the study. Consequently, the interviews’ focus lay on the motives behind the company foundation, the underlying business model, the perception of the concept of the shareconomy, and any benefits and challenges of the concept. Given the exploratory character of the study, the proceeding did not only follow a deductive approach, but an inductive one as well.

3.2 Data collection

Data were collected through interviews with entrepreneurs who founded a business that suits the previously discussed, underlying idea of the shareconomy. These individuals were considered suitable participants for the present study, as they had the necessary knowledge and experience concerning the topic under investigation, within a current real-life setting. Participants for this study came from three countries, namely Austria, Germany, and Switzerland. Suitable companies/entrepreneurs were identified by means of an online search. In a first step, the requirement criteria for interviewees were defined, by using the four-question pyramid by Gläser and Laudel (2010). Gläser and Laudel ask for a strict selection of interviewees, because the selection already decides on the type and the quality of information. The online search was conducted by using the buzzwords “shareconomy”, “share economy”, “founder”, “start-ups” and the countries”. 52 companies could be identified. Afterwards, the authors individually assessed each company to ensure that it demonstrated the necessary relations to the ideas of the shareconomy. Disagreements among the authors were discussed and as a result companies were only selected if a majority of the authors identified the required connection. Thus, our sampling method followed the ideas of purposive sampling (Easterby-Smith et al., 2008). This proceeding led to narrowing down our sample to 14 companies. As this study focuses on the specific conditions for entrepreneurship in a shareconomy, solely the founders/entrepreneurs were considered suitable interview candidates. They were invited to participate in personal or Skype interviews, a process that resulted in 14 interviews conducted in March and April 2014.

Generally, there is no fixed guideline for the number of participants needed, indeed the number depends on research aim, the type of information needed, the issue of credibility, and the resources available (Saunders, 2012). Since Eisenhardt (1989) identifies a saturation degree of newly gained knowledge at ca. one dozen interviews, we considered 14 interviews as an appropriate amount.

It should be noted that the willingness to participate in the study amounted over 90%, only one single company rejected participation. Reasons could be the recent emergence of shareconomy – sharing experiences and learning from each other. This is underlined by the fact that all 14 interviewees agreed to their names being explicitly mentioned in this paper and waived claims of anonymity. A certain marketing effect through a scientific collaboration could be an additional aspect, though it was never explicitly pronounced. Furthermore, none of the interviewees asked for any kind of reward for the interview, which generally lasted between 60 and 80 minutes. The interviews were conducted in German.

Table 1 gives an overview of the interviewed shareconomy entrepreneurs. The average number of employees is around ten (compare Richter et al., 2015), which signals that we are assessing small firms (European Commission, 2003). With the concept of the shareconomy being new, the companies examined were relatively young as well. Regarding the gender distribution, male founders outweigh female founders.

No.	Name	Country	Business model field	Employees	Established	Gender of founder
1	Autonetzer GmbH	Germany	Car-sharing	11	2010	Male
2	BringBee c/o PolyPort GmbH	Switzerland	Community sharing of souvenirs	4	2012	Female
3	Common Vintage GmbH	Germany	Sharing of clothes	1	2012	Female
4	Miavia Limited	Austria	Sharing of travel experiences	5	2013	Male
5	UnserParkplatz GmbH	Germany	Sharing of parking lots	5	2013	Female
6	parku Verwaltung GmbH & Co. KG / AG	Germany Switzerland	Sharing of parking lots	33	2012	Male
7	Sharely AG	Switzerland	Sharing of utility objects	6	2013	Male
8	Selando Gbr. / Mitpackgelegenheit	Germany	Community sharing of souvenirs	3	2013	Male
9	Ezebee AG	Switzerland	Sharing of all items	24	2012	Male
10	LifeThek GmbH	Germany	Sharing of media items	5	2012	Male
11	MamiKreisel GmbH	Germany	Sharing of children toys and clothes	6	2012	Male
12	Usetwice	Austria	Sharing of utility objects	3	2012	Male
13	Mila AG	Switzerland Germany	Sharing of services	35	2013	Male
14	PaulCamper GmbH	Germany	Sharing of camping mobiles	3	2013	Male

Table 1. Overview of the participating companies/entrepreneurs

3.3 Analysis

All interviews were recorded electronically, then transcribed, and finally coded. The codification started with already known themes outlined in the literature section of this study and was enriched by new themes raised by the interviewees. Therefore, the overall approach to data analysis followed a combination of inductive and deductive reasoning (Saunders et al., 2009), that is, the findings from the interviews were combined with the current body of knowledge regarding the concept of the shareconomy and expanded by new aspects that were introduced during the interviews. In other words, the prior framing (deductive stage) supported in coming close to the interviewees but was open to amendments and changes (inductive stage). This proceeding led to nine themes in total, which are displayed in Table 1.

Theme	Origin
Sharing of digital contents	Literature
Sharing of physical goods	Literature
Customers as providers and consumers	Interviews
Mindset	Interviews
Changed living conditions	Interviews
Urbanity	Interviews
Real win-win situation	Interviews
Added value	Interviews
Trusting business model	Interviews

Table 1. Summary of themes used in the study

Data analysis was conducted in German. Also the writing of findings happened in German. Once this was completed, the findings were translated into English. A person who is bilingual carried out the translation. This proceeding increases the likelihood that the meaning of the speech is preserved, as far as possible (Griffin and Pustay, 2010).

4 Findings

Based on the interview findings, we were able to explore a number of factors that were related to shareconomy and entrepreneurship. These factors are presented below.

The framework established by Kempf (2013) served as basis for the analyzes, therefore the results will be compared to each other and the framework will be adjusted at the end.

It has to be mentioned that the theme “Participation in commercial, cultural, and social projects” could not be established in this study in the existing form of the term. This is probably due to the cumbersome formulation. Because the general willingness to participate in social or cultural projects is given, the participation in commercial projects remains missing.

4.1 Sharing of digital content

Our evidence clearly highlights that entrepreneurs take advantage of the opportunities provided by ICT as well as social and mobile web in order to provide their businesses to users (customers). The entrepreneurs are also trying to continuously develop their offerings to make their business models more handy and usable for potential and existing users. For example, interviewee 4 has planned to provide an app that can be used for the self-documentation of travels.

The findings also show that only with these ICT developments, the business models offered were actually possible to establish in a reality setting. On that matter, interviewee 9 stated that *today there are these technical means to organize it so that utility for unused time can be created with great accuracy. Thirty years ago, this wasn't possible.* These developments have made it easier to become an entrepreneur, as less tangible and intangible resources are required. Interviewee 12 gives an illustration: *Only thanks to the Internet it is possible for private persons to have business contacts with each other, those did not exist previously. There are many micro entrepreneurs which can do business with the resources at hand. What earlier was only limited to larger deals can nowadays be realized one to one.* His statement also clarifies the implications of these developments for marketing: mass-customization

has established itself.

4.2 Sharing of physical goods

The sharing of physical goods, which are currently not used or needed, forms the main fundament of the business models, which is in line with extant literature outlined above. The following statements illustrate this:

Interviewee 1: *The business model is quite simple. There are people with cars who did not use them all the time. And there are many people who deliberately abstain from having a car or who did not have the right car and so are interested in having access to a car from time to time. We are trying to bring these individuals together.*

Interviewee 3: *We have enough of everything, so the main issue is to make it available. If 5,000 pieces of clothing that I can't wear are lying around in my closet, it is stupid not to make it visible, so these pieces will not have to come from China.*

Interviewee 6: *It is about a more efficient use of limited resources. One can see a rethinking of the people in that direction that status symbols are less relevant compared to earlier days and one can see how innovative technologies make it possible to converse with each other, without losing quality.*

4.3 Customers as providers and consumers (prosumers)

The findings provide some evidence that customers can take two different roles in businesses provided by the shareconomy, namely that of a goods and services provider and that of a user of these goods and services:

Interviewee 2: *Around 50% of my customers say that they would do both. I offer and I use.* And Interviewee 4 stated *„at any time one can access the individual travel moments, share them, and present them.* The findings underline the power of the shareconomy to provide an opportunity for individuals of being active participants not only in terms of consumption but also of production, delivery, and promotion of the services and/or products as well (Tuten & Solomon, 2013).

4.4 Open mindset

The analysis of the findings suggests that the acceptance and introduction of the shareconomy businesses is supported by the existence of a certain mindset to be found with both sides: entrepreneur and customer (user). From the customer side, this mindset requires a positive attitude towards sharing and the ideas of sustainability and openness. And this mindset is not a matter of age, even though among younger generations these attributes might be found more often.

Interviewee 1: *The typical customer has a high affinity with sharing. One brings this sharing mindset and this mindset can be possessed by someone who is in their early twenties or someone who is sixty years old.*

Interviewee 7: *We need a specific way of thinking... an openness for those projects.*

Interviewee 13: *People are more willing and prepared to share and to rent rather than to possess. This supports the idea of Shareconomy.*

Regarding the side of the entrepreneurs, they might act upon their personal wish of doing something good (Interviewee 11). Additionally, a positive attitude towards collaboration between the entrepreneurs can be determined. In this context, interviewee 5 declared *shareconomy is something good. All companies active in this area like to connect and are easily accessible.* This situation also contributes to a higher number of integrated offerings in order to serve customers even better: interviewee 10: *“We are having cooperation with Car-To-Go and Cambio-Carsharing, with whom we have developed complementary strategies. There is someone who has a car who needs a child seat and someone who is on their way with the children using carsharing and needs a tent at once as one may go camping.*

Access is provided by a network.

The development of this mindset has been supported by different incidents, such as the aftermath of the financial crisis and the rising interest in the underlying assumptions of sustainability, specifically regarding the economy and its functioning: Interviewee 7: The issue if sustainability is an important part of Shareconomy. We try to develop business models which come from the daily demand situation. Sustainability is a key factor of our idea. It helps to gain acceptance.

Interviewee 9: *...on the other hand, there is a strong demand for getting away from this growth oriented capitalism and a move to resource oriented thinking. What is the demand for goods and products?*

4.5 Changed living conditions

The findings suggest that changed living conditions have provided a fruitful basis for the shareconomy and its offerings. Societies have been developing into more mobile and less stable ones, which in turn calls for alternative and novel business models. Additionally, these changes have led to a different attitude towards property, which worked in favor of the concept of the shareconomy.

Interviewee 9: *... also the fact that one can no longer bank on static life and career planning. People who are in their fifties don't know this. They have completed school education, have studied, and said this would provide a lifelong employment... Younger generation cannot plan that way, more globalization, more movement, more career changes Whenever the career fails, the young generation has to be ready to create own ideas and move on. One trend we recognized in the last years is the comeback of repairing products instead of buying new ones.*

On that matter, interviewee 10 highlighted the issue of mobility and stated that *our students are not interested in buying new things at all, as they don't know where they are going to be in two or three years.*

These changed conditions have made the development of new mindsets as specified in section 4.4 possible.

4.6 Urbanity

Although the findings suggest that the business location was not strategically chosen but mainly a pragmatic decision (i.e., residence of the founder(s); rooted in the city), the companies are all located in bigger cities or metropolitan areas, such as Berlin, Munich, Palma de Mallorca, Vienna, or Zurich. The underlying reasons are greater openness to new solutions, greater anonymity and mobility, greater number of like-minded individuals, better education, higher salaries, lack of space and resources, better ICT infrastructure, and adoption rate, as highlighted in the exemplary statements:

Interviewee 2: *Yes, here in the countryside the people have neighborly relations, extended families. Therefore they don't need a Shareconomy, they have everything on site. In cities it is more international, more anonymous, higher fluctuation. So it does make sense to open up for new models.*

Interviewee 10: *The life in cities is expensive. So one has to organize himself/herself in order to cope with the money available.*

Interviewee 12: *Many people live here in a relatively small area, so it is easier to reach the critical mass for the business model. The area of living is smaller, flats are smaller, storage room is not given unlimited. The decision "buy or rent" is more relevant due to this simple issued of storage room. People in cities are supposed to be higher educated in general, higher salaries are paid and most of the time, trends are started in cities. Therefore, we start our business there.*

The statements by interviewee 10 and 12 clarify the issue of scarcity of resources as both, motive and basis of success for shareconomy business models. The statements also underline that urbanity provides a higher and necessary likelihood of getting access to people sharing the same mindset (section 4.4).

4.7 Real win-win situation

The findings showed that shareconomy business models follow the idea of involving actors of equal standing. Consequently, the outcomes of the transactions between entrepreneur and customer can be regarded as a win-win situation, in which both actors regard themselves as winners.

Interviewee 1: Shareconomy is a personal business, not a “cold” business relation. It is always a personal experience, in a peer-group related environment. More personal means more emotion, more details and more chances to connect to the business model. We offer business experiences, what makes is special. Whenever you read marketing books about great companies, it tells about customer experience management. We definitely work on that part. They have to feel the difference.

Interviewee 7: *The image of previous times that a company is large, bad, and profit-oriented, and determines what will be sold will no longer work in the shareconomy. In the end, private persons are the ones that matter.*

4.8 Added value

The findings indicate that the transactions taking place in the shareconomy deliver important value added, which not only benefits the two parties involved but also society as a whole. In regard of the three aspects of sustainability (economic, environmental, and social issues), one can conclude that the business models involved, contribute to at least two of these aspects.

Economic and social issues

Interviewee 3: *The events we are organizing are the highlights. Many people find new friends which underlines the social aspect.*

Interviewee 13: The social aspect is very strong in relationship with retirees. They reported about more daily joy due to a concrete job or service they are offering. The experience the feeling of being needed, which is more important for them than earning money. It is a great opportunity to make contacts, stay in touch with several generations.

Economic and environmental issues

Interviewee 5: No personal parking spaces are needed anymore, the spaces are already reserved and available in a great amount. It saves life time and good mood, energy, petrol and CO₂. *Most of the time cars are just parking. We try to move them – and gain advantage of it.*

Interviewee 9: *On the one side, one gains an economic advantage. On the other hand, one is assured to do something valuable for the environment.*

Economic, environmental and social issues

Interviewee 8:

Our customers are very interested in some personal words or personal help. Especially elderly persons are interested in our personal business – it is the lack of social commitment in bigger cities. They are looking for social components in their life; we offer it. At the same time, the business model is very easy to understand and way more comfortable.

Interviewee 11:

The most dominant part for our customers is saving money. But several additional advantages are given: For example, some customers told me that they are happy about *the fact that the textiles have already been washed several times so toxic substances are gone. Thirdly, the mothers can get in touch with other mothers.*

4.9 A trustworthy business model

As with other online business models that are focusing on (online) trade, trust is an issue that matters in the shareconomy. The findings suggest that a trustworthy, transparent, and reliable business model is even more important, which may reflect the increased expectations from the customers regarding nowadays business models.

Interviewee 7: *A platform such as Sharely is about transparency and closeness to customers and about dialog and honesty. ... We are a provider one can trust. We have a rating system and a Sharely goodwill, a kind of insurance. These two elements help in establishing trust into our platform*

Interviewee 9: *... the reliability of the platform. We are talking about how to control one's users, how to distinguish the black sheep from the good ones and how to rapidly discard those black sheep.*

Interviewee 11: *Assuming responsibility is something that unfortunately has disappeared in our society. Now people stand up and say: I believe in this product (or business model). I try to reach the best for myself, but also for the community.*

5 Discussion

During the interviews, nine different themes of shareconomy could be addressed. In particular, the sharing of digital content and physical goods, the idea of prosumers, changed living conditions, and *added value*. As stated above, the aspect of “participation in commercial, cultural, and social projects” was not mentioned at all during the interviews. This is surprising because several theoretical articles consider the social aspect of the shareconomy as the most important and most changing aspect in the existing business world, and even talk about “social transformation through Shareconomy” (Castells, 2013). The aspect “participation in commercial, cultural, and social projects” seems to be misleading, the general willingness to participate in social activities (e.g., sustainability) is given, the existing term is hard to catch.

The nine different themes are listed below for a better overview:

1	Sharing of digital content
2	Sharing of physical goods
3	Customers as providers and consumers (prosumers)
4	Open mindset
5	Changed living conditions
6	Urbanity
7	Real win-win situation
8	Added value
9	A trusting business model

Table 2. *Central aspects of the interviews*

Comparing the results of 14 interviews in order to identify the circumstances which affect entrepreneurs in their work in the field of shareconomy with the framework by Kemp (2013), shows urgent needs for readjustments.

Establishing a solid basis for the field of application is needed. In the context of shareconomy, this means a trusting business model and customers as providers and consumers (prosumers). These two requirements are elementary. In comparison to the framework by Kemp (2013), the pure existence of

Internet, ITC, and mobile phones finds no mentioning anymore. The existence of those requirements is obviously expected in well-developed countries like Germany, Switzerland, and Austria. This elderly requirement will not find recognition in the future framework.

The insights of the interviews forces the authors to add a new component – the drivers of shareconomy. The link to the research of entrepreneurship is given – the motivations of change in the established consumer behavior are changed living conditions, urbanity, and open mindsets.

The field of changed living conditions is a broad area, which touches different academic fields such as urban planning, social research, and entrepreneurship. The less predictable and less local “way of life” dominates the presence. Remote workplaces, flexible working time models, and a higher demand for work-life-balance are well-discussed in public and among the young generation of employees (Kelly et al., 2014). The much-discussed rural exodus and the corresponding reinforced *urbanity* are major drivers for the changed consumer behavior and the will and need to share objects or digital goods.

The frequently named ideas of open mindsets, general openness and affinity to share, constitute the dominating aspects for the customers. Doing something good and sharing something with someone to gain a positive feeling, are other drivers that are commonly discussed.

The three fundamental fields of application in the field of shareconomy remain. The sharing of digital content and physical goods is the main component of shareconomy. Economical advantages are a strong argument for participating in the shareconomy. Less consumer investments, lower fixed costs, a higher degree of selection, getting to know new aspects, sustainability, and saving resources are further aspects named in the interviews, which strongly underline the existence of the two fields of applications.

The third aspect is renamed – sharing in context of social projects. The former third aspect was named “Participation in commercial, cultural, and social projects” and could not be confirmed in the interviews. One specific reason is the obvious contrast of “sharing” on the one side and “commercial” on the other side. As business making with a more social approach could not find support, it will not find recognition in the future framework. Generally, it is to be stated, that the social aspect of shareconomy is supporting the knowledge and encouragement of the new concept. Supporting refugees via shareconomy platforms completely without monetary interests constitutes a concrete example. Therefore, the exclusive use of the shareconomy for social/charitable issues could be confirmed.

The framework was expanded by the goals of shareconomy: creating and participating of *added value* and being a component of a *real win-win situation*. It is important to underline that shareconomy is not purely a social approach as the entrepreneurs want to earn sufficient funds to make a living – or even more – out of their business model. But, and this is important, the customer have to notice their own benefit, otherwise the idea of sharing via specific platforms will not be successful.

Business models differ regarding the utility offered and the use for costumers. Besides branding aspects (e.g., a specific history or a certain emotion that can be created), which may help to make an average product/service a sought-after one, a key factor of business model success is its *customer benefit*, which was also clearly underlined in this study. Smarter, cheaper, faster, or more extravagant offerings and business ideas are possible attributes for reaching this aim. Start-up entrepreneurs should seek to build a business based on trust, where customers and entrepreneurs have the feeling of mutual dependence and can rely on each other. Taking the “perceived social and or environmental contributions” into consideration when designing their business model, the start-up entrepreneurs can establish win-win situations, benefiting not only themselves but also giving the customers the feeling of receiving a benefit.

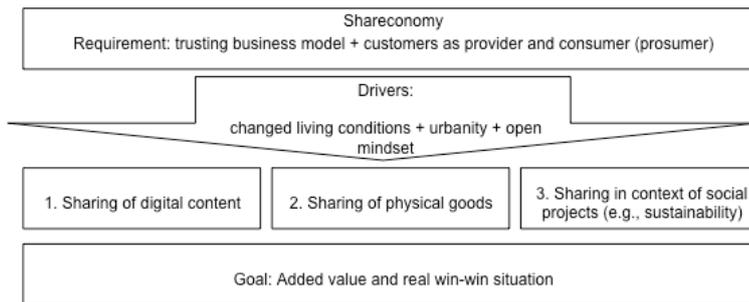


Figure 2 Further developed framework of shareconomy

Figure 2 shows the modified and advanced framework, originally created by Kempf (2013). This framework consists of basic requirements, drivers, fields of application, and the goals of shareconomy and contains the insights of 14 interviews with entrepreneurs. Since this article is the first to address this topic with a qualitative approach and, therefore, exceeds the pure literature work and presents concrete circumstances affecting the entrepreneur, it will serve as base for further discussion, criticism, or support. As the fast pace of the phenomenon of shareconomy will support the rapid change, this framework serves as a friction surface and as basis for further scientific work.

The advanced framework gives concrete answers regarding the research question; the main topics for entrepreneurs are worked out and will be the starting point for further research and discussion. As referring to the title of this article, the authors proceed on the assumption that the phenomena of shareconomy will grow rapidly in the near future. Beside the enormous business opportunities and the positive outlook and revenue forecasts, the changing mindset will support further developments in this specific field. As sharing and creating real *added value* and serious win-win situation is not subject to limitations, a trustworthy business model constitutes the necessary requirement. Shareconomy is going to play a more important role for social behavior and the classic consumer – therefore it is accepted as a future concept that will not end up as a buzzword without content but rather comprise the ability to transform behavior and business models.

6 Conclusion

In this article we explored the newly arising topic of shareconomy in more detail and discussed several examples of entrepreneurial approaches to it. This is the first article with a qualitative approach and in-depth interviews with entrepreneurs working in this field. Existing literature and derived conditions have been tested on real relevance, and concrete fields of action could be identified. Furthermore, the paper sheds light on the shareconomy as conducted in a German-speaking environment. Therefore, it expands our understanding of this concept in different parts of the world. Based on our qualitative empirical results, we can conclude that the shareconomy is a very young form of entrepreneurship that aims at monetizing ideas and comprises a business making with a forward-looking orientation.

The shareconomy relies on modern information and communication technology and Web 2.0 in order to establish successful business models that are based on sharing underutilized assets for monetary and non-monetary benefits. 14 semi-structured interviews with start-up entrepreneurs from Germany, Austria, and Switzerland provided more insights in this new area of interest. The interviews showed the elementary requirements of shareconomy: a trusting business model and a base of customers which also act as providers. Also, drivers for the movement of shareconomy are named: the interviews revealed that changing living situations – such as urbanization, higher flexibility, and mobility – have established the foundation for entrepreneurial activity and applications. Additionally, the trend to more openness supports the concept.

While the interviewees confirmed the presence and importance of sharing digital content and physical goods, the findings of our exploratory study could not completely support the third theme identified in the literature – namely that of participation in commercial, cultural, and social projects. The participation in commercial projects was declined and accordingly renamed.

Additionally, interview findings suggest that while customers are expecting economic advantages as well as social and economic contributions through shareconomy, the entrepreneurs' major motive seems to be the realization of economic benefits. Consequently, these findings suggest that the shareconomy cannot be regarded as a business model, which solely serves social aspects, but rather as a business model that is similar to renting and leasing, and offers the opportunity of revenues.

Like every other study, this article is subject to a number of limitations. This, however, presents possibilities for future research. The small number of participants provides only a very restricted view of the shareconomy and the geographical setting of the German-speaking countries, which are doing extraordinarily well in these times of ongoing worldwide economic crises, may have introduced a bias, rendering the findings at least partly unsuitable for application in other countries.

Future research could also include other perspectives, e.g. that of the customers, to obtain a more balanced understanding of shareconomy. Furthermore, future quantitative empirical research design would allow for more generalizable findings and conclusions. An examination of these limitations could positively influence the design of future studies. The integration of the shareconomy and the academic field of entrepreneurship clearly need more attention and development in order to better understand the different options shareconomy can offer to the study of start-up success in this area. A closer examination of the importance of the social aspect for customers as well as entrepreneurs is called for.

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Publication VI

Kraus, S., Richter, C., Brem, A., Chang, M.-L., and Cheng, C.-F.

Strategies for reward-based crowdfunding campaigns

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Empirical paper

Strategies for reward-based crowdfunding campaigns



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ABSTRACT

Crowdfunding represents an alternative way of funding entrepreneurial ventures – and is attracting a high amount of interest in research as well as practice. Against this background, this paper analyzes reward-based crowdfunding campaign strategies and their communication tools. To do this, 446 crowdfunding projects were gathered and empirically analyzed. Three different paths of successful crowdfunding projects could be identified and are described in detail. Practical implications of crowdfunding strategies are derived, and are dependent on the required sales effort and the project added value. The terms *communicator*, *networker* and *self-runner* are created for this crowdfunding strategy and filled with practical examples. This paper contributes to the literature in different ways: first, it sheds more light on the developing concept of crowdfunding, with an overview of current academic discussions on crowdfunding. Furthermore, the analysis of success factors for crowdfunding initiatives adds to an emerging area of research and allows entrepreneurs to extract best practice examples for increasing the probability of successful crowdfunding projects under consideration of the key influencing factors of communication.

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Estrategias para campañas de crowdfunding de recompensa

RESUMEN

El crowdfunding representa un modo alternativo de financiar proyectos empresariales – y está atrayendo un gran interés tanto en el ámbito de la investigación como en la práctica. En este contexto, este artículo analiza las estrategias de campañas de crowdfunding de recompensa y sus herramientas de comunicación. Con este fin, se han reunido y

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analizado empíricamente 446 proyectos de crowdfunding. Se han podido identificar tres formas diferentes de proyectos con éxito de crowdfunding, que son descritos en detalle. Las implicaciones prácticas de las estrategias de crowdfunding son obtenidas y dependen del *sales effort* requerido y del *valor añadido del proyecto*. Los términos *comunicador*, *networker* y *self-runner* son creados para esta estrategia de crowdfunding y explicados con ejemplos prácticos. Este artículo contribuye a la literatura en diferentes formas. En primer lugar, aclara el concepto en desarrollo de crowdfunding al proporcionar una visión general de las discusiones académicas actuales de en esta materia. Además, el análisis de los factores de éxito para las iniciativas de crowdfunding es valioso para esta área emergente de investigación y permite a los emprendedores extraer ejemplos de las mejores prácticas para así aumentar la probabilidad de éxito en proyectos de crowdfunding bajo la consideración de factores influyentes de comunicación clave.

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Introduction

Facing the problems of insufficient cash flows and an information asymmetry with investors about the venture's quality, the greatest challenge for entrepreneurs is to attract outside funding for their venture, especially in the beginning of their entrepreneurial activity (Cosh, Cumming, & Hughes, 2009). A lack of operating history and/or proven track record contributes to the challenges of obtaining credit (Stemler, 2013). Entrepreneurs therefore often turn to a variety of external capital sources, including venture capitalist funds, banks, leasing firms, as well as private individuals (Cosh et al., 2009) such as the entrepreneur's friends and family (Agrawal, Catalini, & Goldfarb, 2014). The use of internal financing through personal funds, family and friends, also called *bootstrapping* (Belleflamme, Lambert, & Schwienbacher, 2014; Brush, Carter, Gatewood, Greene, & Hart, 2006; Ebben & Johnson, 2006; Sannajust, Roux, & Chaibi, 2014; Winborg & Landström, 2001), remains one of the most used options. However, many ventures are not successful in attracting sufficient capital due to failed attempts to convince investors, a lack of sufficiently large sums from investors in general, and a lack of concrete specification of industries or what capital is needed for (Lambert & Schwienbacher, 2010). A new form of funding for small entrepreneurs has however recently emerged: entrepreneurs turn to a large number of individuals, the crowd, to raise funds (Agrawal, Catalini, & Goldfarb, 2013; Kleeman, Vofß, & Rieder, 2008; Unterberg, 2010). So-called *crowdfunding*, which describes a large number of investors' contributions of finances to projects, products, or business ideas (Wenzlaff, Gumpelmaier, & Eisfeld-Reschke, 2012), has emerged as an alternative possibility for individuals to receive funding in different ways (Tomczak and Brem, 2013).

The concept of mobilizing funding in small pieces is not new, and traditionally occurs in almost every corporation (Fiedler & Horsch, 2014; Harrisson, 2013; Zademach & Baumeister, 2013). Contrary to typical financial investments, crowdfunding is fundamentally open to everyone (Blohm, Leimeister, Wenzlaff, & Gebert, 2013; Wenzlaff et al., 2012). The concept originally gained prominence with the financing of artists or creative projects and then spread across further sectors (Bradford, 2012; Meinshausen, Schiereck, & Stimeier,

2012). Initiatives in journalism, software, and fashion constitute examples of the ongoing spread of this funding concept (Schwienbacher & Larralde, 2010).

The remainder of this paper will first see a literature review discussing several alternative definitions of crowdfunding, clarifying the main concepts of this type of funding, including different models and actors. This part sets a common understanding of crowdfunding. The methodology section then defines key variables, analyzes the prior-defined dataset, and describes the approach taken to answer the research question "What factors are responsible for a successful crowdfunding campaign?". Third, a discussion of findings provides the reader with greater insights into relevant factors that determine the success of crowdfunding initiatives. The conclusion summarizes key thoughts and theories, discusses limitations of this study, and points to future research directions.

Background

Definitions

Crowdfunding has evolved from the concept of crowdsourcing and represents one dimension of this phenomenon that includes crowdvoting and crowdcreation (e.g. Leimeister & Zogaj, 2013; Leimeister, 2012; Richter, Seidler-de Alwis, & Jötten, 2014). The term originally comes from Howe (2006a, 2006b, 2008), who defined crowdsourcing in an online article in 2006:

"The act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call." – (2006a, p.1; 2006b, p.1)

This definition to date remains the most prominent scientific one, which we will therefore follow (Brabham, 2009; Starbird, 2012). The term *crowdsourcing* stems from "crowd" and "outsourcing," pointing to the meaning to outsource specific functions to a group of external persons (Kleeman et al., 2008). Entrepreneurs and companies not only can obtain feedback and creative solution to business problems, but can also

tap into individuals' excess capacities, such as their financial resources (Zheng, Li, Wu, & Xu, 2014).

In addition to crowdfunding's embeddedness in crowdsourcing (Lehner, 2013; Zheng et al., 2014), it also borrows concepts from micro finance (Mollick, 2014); crowdfunding is in fact closely connected to micro lending (Vitale, 2013), a concept that refers to the idea of funding individuals who do not have access to conventional financing from credit institutions (Armendariz & Morduch, 2010).

Similar to crowdsourcing, crowdfunding finds itself in a juvenile state of scientific research (Howe, 2008; Mollick, 2014). This is why various definitions of crowdfunding exist, none of which have received overall scientific acceptance (e.g. Belleflamme et al., 2014; Tomczak & Brem, 2013; Bouncken, Komorek, & Kraus, 2015). Upon close examination of the various definitions, some reoccurring patterns include: crowdfunding focuses on raising financial funding from the public, represented by a group of people, using specific internet-based platforms (e.g. Mazzola & Distefano, 2010; Ribiere & Tuggle, 2010; Yang, Adamic, & Ackerman, 2008).

Crowdfunding as a two-sided market

Crowdfunding is typically a two-sided market, tying "together two distinct groups of users in a network" (Eisenmann, Parker, & Van Alstyne, 2006, p. 2). Two-sided networks have a subsidy-side and a money-side. The subsidy-side consists of a group of investors, the funders or "backers" that contribute to the money-side, that is, the founder. Intermediaries, usually online platforms such as Kickstarter, charge fees to fundraisers while funders are not required to pay fees to the platform (e.g. Indiegogo, 2014; Kickstarter, 2014; Osterwalder & Pigneur, 2010).

Crowdfunding models

The dimensions of crowdfunding differ in terms of the allocation of resources and the return to investors (e.g. Moritz & Block, 2014; Tomczak & Brem, 2013; Zhang, 2013). Individuals composing the crowd generally receive rewards in different ways: material compensation, often in the form of monetary rewards (Vukovic, Mariana, & Laredo, 2009), or immaterial compensation in the form of social acknowledgment (Kazai, 2011) are the most prominent. In the case of material compensation, the reward can consist of monetary payments when the project initiators agree to refund the paid amount directly. This can also occur indirectly with rewards composed of products or services (Pelzer, Wenzlaff, & Eisfeld-Reschke, 2012). Overall, scholars divide crowdfunding into four models, as displayed in Fig. 1: donation-based crowdfunding, reward-based crowdfunding, crowdlending, and equity-based crowdfunding (e.g. Beck, 2012; Giudici, Nava, Rossi Lamastra, & Verecondo, 2012; Leimeister, 2012).

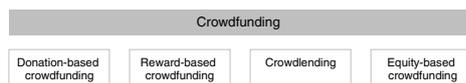


Fig. 1 – Types of crowdfunding.

The following briefly outlines the four options for the sake of completeness:

The donation-based crowdfunding model refers to a classic fundraising objective, with the difference that the donations arrive via Web 2.0 and in most cases through a specific intermediary. Investors do not expect material rewards in exchange for their contribution (Giudici et al., 2012), but a social reward instead (e.g. acknowledgements) (Leimeister & Zogaj, 2013). The reward model offers both material as well as immaterial compensation and is currently the most prevalent crowdfunding model (Mollick, 2014). On the one hand, funders can benefit from pre-selling or pre-ordering, thereby receiving the financed project or product before publication or market entrance, often at a better price (Hemer, Schneider, Dornbusch, & Frey, 2011; Röhler & Wenzlaff, 2011) or even only at the price of an acknowledgment or plug (Belleflamme, Lambert, & Schwiendbacher, 2013; Kortleben & Vollmar, 2012). The most cited, analyzed, and one of the oldest and largest crowdfunding platforms, Kickstarter, is a reward-based community (Frydrych, Bock, Kinder, & Koeck, 2014; Kuppuswamy & Bayus, 2014). Reward-based projects are often non-profit organizations, for example a registered association (this is an "e.V." in Germany). Based on earlier research, they tend to be more successful than other organizational forms of crowdfunding (Belleflamme et al., 2013).

In the lending model, investors provide funds through small loans (Allison, Davis, Short, & Webb, 2015; Bruton, Khavul, Siegel, & Wright, 2015). In this type of crowdfunding, funders can earn an interest payment that was contractually agreed upon before the loan was made (Giudici et al., 2012). These kinds of contracts can either be between private persons, so called peer-to-peer lending (Hemer et al., 2011; Kaltenbeck, 2011; Kortleben & Vollmar, 2012), or between private persons and companies (Barasinka & Schäfer, 2010; Mach, Carter, & Slatery, 2013).

The equity-based crowdfunding model treats project funders as investors by making them equity stakeholders in return for their support (Mollick, 2014) with the goal of profit sharing in the future (Beck, 2012; Brem & Wassong, 2014). Here, the crowd buys shares of the fundraised company. In the German-speaking realm, this type of crowdfunding is often referred to as *crowdinvesting*, *crowdlending* (e.g. Brem, Jovanovic, & Tomczak, 2014; Hornuf & Klöhn, 2013; Leimeister & Zogaj, 2013) or *investment crowdfunding* (Barnett, 2013, p. 1).

Literature review

Academic literature on factors determining the success of a crowdfunding project is rather limited. However, a few authors have in fact made initial attempts at analyzing some characteristics of successful crowdfunding projects.

The literature review has two parts: literature on success factors in the preparation of the crowdfunding project and success factors during the crowdfunding project.

Starting with the success factor in the preparation time, Belleflamme, Lambert, & Schwiendbacher, 2010 for example find that the type of project has an effect on the success rate. In fact, projects that are part of non-profit organizations are more successful than other organizational forms.

The authors see the reason for this in the argument made by [Glaeser and Shleifer \(2001\)](#) who suggest that due to the reduced focus on profits, non-profit organizations find it easier to attract outside capital. In addition, [Mollick \(2014\)](#) examines the underlying dynamics of project success and failure and concludes that social network size as well as the project's quality relates to project success. The author further suggests that geography has an influence on project success, reasoning that founders' proximity to project supporters results in more successful projects. [Colombo, Franzoni, and Rossi-Lamastra \(2015\)](#) empirically investigate the relationship between the early contributions shortly after the launch and the success of the crowdfunding campaign. [Cholakova and Clarysse \(2015\)](#) investigate the motivation of investing in crowdfunding, but not the specific factors of a project. [Mollick \(2014\)](#) argues that potential funders are more likely to select realistic funding goals, as project goals that are too high or too low are not likely to lead to a successful funded project.

The second part of the literature review observes success factors during the crowdfunding project. This observes in detail web presence, the amount of supporters/backers, updates and blog entries, rewards/incentives, and the number of comments.

The following section subsumes different aspects, hereafter called *web presence*, a term that consists of videos and pictures in the project presentation, a personal picture of the project owner, the existence of a separate Facebook page, or websites.

[Wheat, Wang, Byrnes, and Ranganathan \(2013\)](#) describe the video as the most important part of the funding appeal to potential project backers. Videos should touch the heart of backers and tell a real story about the own project. Mollick identifies the lack of a video as extremely negative, stating how "producing a video is a clear signal of at least minimum preparation" (2014, p. 8). [Wheat et al. \(2013\)](#) make another important point: the video is an opportunity to introduce the project owner or team. [Cholakova and Clarysse \(2015\)](#) describe how backers recognizing a project owner in the video have no positive influence on the project's success. They found out that a personal, emotional relationship between the project owner and the backers is not positively related to the investment in a crowdfunding project ([Cholakova & Clarysse, 2015](#), p. 160).

[Zheng et al. \(2014\)](#) encourage the use of information about the project through various media to improve the communication and the understanding between the entrepreneurs and the backers (sponsors). According to [Boeuf, Darveau, & Legoux, 2014](#), announcements of personal information about the entrepreneur (project owner) including personal pictures are considered positive due to the higher trust and serious support this achieves from the backers. [Colombo et al. \(2015\)](#) point out that crowdfunding platforms are a social environment, and therefore a picture of the project owner underlines the social capital component and boosts the probability of successful projects.

[Mollick \(2014\)](#) points to the increasingly important role of social networks in funding new ventures. Further, authors such as [Belleflamme et al. \(2014\)](#) highlight the importance of Web 2.0 and social networks to facilitate founders' access to the crowd. A link to the founder's or project's Facebook page, visible on the project description page or the founder's

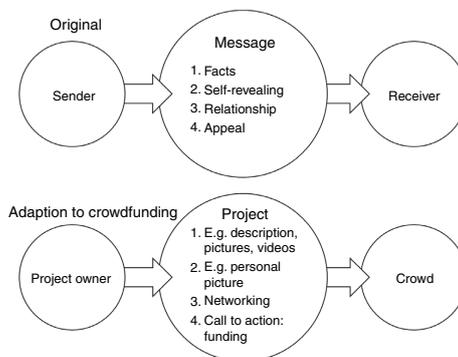


Fig. 2 – Theory of communication by Schulz von Thun (2000) and the adaption to crowdfunding.

profile, facilitates access to the project's social network page. Interested backers can gain more information on the founder and the project and can easily create awareness of it through liking and sharing the page. The availability of a direct link to the founder's Facebook page is documented in a dichotomous variable that will be used in the models later in this study. Due to the importance of Web 2.0 in crowdfunding ([Belleflamme et al., 2014](#)), the existence of a website supplying more information to potential funders should have an effect on project success. Furthermore, [Frydrych et al. \(2014\)](#) argue that information on the founder or the founding organization adds legitimacy to the project, attracting more funders as a result. Hence, the availability of a link to the project's website on the founder's profile or the project description page is coded into a dichotomous variable that functions as an independent variable in this study. [Belleflamme et al. \(2014\)](#) state that strong engagement in social networking activities does not raise the funding amount. On the other hand, [Lu, Xie, Kong, and Yu \(2014\)](#) argue that social networking, especially in the early stage of the project, can strongly raise the probability of a successful project funding. [Byrnes, Ranganathan, Walker, and Faulkes \(2014\)](#) highlight e-mailing to social networks as a driver of successful projects.

Finally, considering the high relevance of the communication between the project owner and the crowd, the classical theory of communication is also important. In his four-sided model, [Schulz von Thun \(2000\)](#) reveals that every piece of information between the sender (in our case the project owner) and the receiver (crowd) consists of four facets: facts, self-revealing, relationship, and appeal. Applying this theory to crowdfunding, challenges in communication can lead to poor funding results (see [Fig. 2](#)). Therefore, the transmission of a mix of facts, personal information, customer relationship, and the call to action itself are the fundamental duty of the project owner and determine the success of projects (e.g. [Hui, Greenberg, & Gerber, 2014; Wu, Wang, & Li, 2015](#)).

[Colombo et al. \(2015\)](#) underlines the importance of strong support by backers in the early stage of the project, especially when the quality of the product is unclear. Whenever potential

backers recognize that funding has already taken place, they are more encouraged to donate. The information about the amount of backers and the money collected are clear indicators of interest and are therefore highlighted by the platforms. According to [Kuppuswamy and Bayus \(2014\)](#), backers typically join projects in the very early stages and in the end.

[Xu et al. \(2014\)](#) underline the importance of *updates and blog entries*. The tendency here is clear: updates are crucial. Projects with frequent updates can almost double the probability of successful funding (32.6% vs. 58.7%) in their specific cases. Xu et al. compare the importance of updates with the initial presentation of the project on the platform. An intensive communication between the project creator and the community is “more predictive of success than the representation of the project page” ([Xu et al., 2014](#), p. 9). [Kuppuswamy and Bayus \(2014\)](#) discover that recent updates, especially in the final stage of the crowdfunding project, have a positive influence on achieving the project goal in how they awaken emotions and excitement from backers.

In the different dimensions of crowdfunding, backers can receive either material rewards ([Vukovic et al., 2009](#)) or immaterial rewards through social acknowledgment ([Kazai, 2011](#)). Recording the number of rewards backers receive in gratitude for supporting a project allows conclusions about backers' motivation for participation. [Steinberg \(2012\)](#) denotes the incentives as the most important motivation for participating; it is therefore the all-important aspect for a successful project. [Wheat et al. \(2013\)](#) shows how incentives are expected and should have a personal connection to the project. According to Wheat, public acknowledgment without material rewards is the most promising pathway. The least promising form on the other hand is not offering any incentives, while a middle way is offering material incentives. [Colombo et al. \(2015\)](#) underlines the importance of incentives, especially for generating backers in the very early stage of the project.

The number of comments on a project matter as well. [Antonenko, Lee, and Kleinheksel \(2014\)](#) point out that intensive communication positively impacts successful projects on the project website, as well as reacting promptly to questions, posting own questions, and providing frequent status updates.

Methodology

Research approach

Reward-based crowdfunding is the dominant type of crowdfunding when it comes to the funds raised and number of projects ([Wilson & Testoni, 2014](#)). Against this background, this paper focuses on empirical evidence about what factors are responsible for a successful crowdfunding campaign, and has the basis of a reward-based crowdfunding approach. For this, we analyze a platform which focuses on the reward-based approach in Germany. As part of our project, we received data from VisionBakery, a German online platform and service for crowdfunding. A rewarded-based community, VisionBakery is a suitable model of study, thanks to its similar approach to and structure of the worldwide market leader Kickstarter ([Boeuf et al., 2014](#)). It has also been in operation since 2011 ([Sixt, 2014](#)). VisionBakery considers itself as the first supporter

and first funding partner for project owners. Intensive consultancy is part of this relationship, with the common experience of the project and the common will of improvement uniting the platform and the project owner. VisionBakery stands for social interaction and the aim to generate and share practical implications for project success for the next generation of projects ([VisionBakery, 2015](#)), making it a qualified research project.

The data set from VisionBakery comes from all projects since its launch in 2011. There are 446 projects from this date until the end of 2014; canceled projects and not-launched projects were eliminated.

An empirical approach analyzes the data in an effort to answer the research question on success factors of crowdfunding. The applied fuzzy set qualitative comparative analysis (fsQCA) is a new analytic form in frequent use in scientific work in the fields of marketing, innovations and entrepreneurship (e.g. [Huang & Huarng, 2015](#); [Tóth, Thiesbrummel, Henneberg, & Naudé, 2015](#); [Wu & Huarng, 2015](#)). The selected analyses represent an innovation model to reach advanced empirical analyses, and are a state-of-the-art research approach for entrepreneurship and innovation (e.g. [Mas-Verdú, Ribeiro-Soriano, & Roig-Tierno, 2015](#); [Wu & Huarng, 2015](#)). fsQCA is a suitable approach for this study because it identifies and assesses different paths as well as key success factors. Another important factor for choosing fsQCA is that QCA includes the skill that combinations of factors explain a certain outcome, in our case successful crowdfunding projects. This is the opposing position to the linear causal additivity that conventional variable-oriented methods are based upon ([Aus, 2009](#)). It follows the approach by [Katz and Kahn \(1978\)](#) that “a system can reach the same final state, from different initial conditions and by a variety of different [or multiple] paths.”

Object of analysis

Every founder needs to indicate a target level of funds that a project should achieve. Similar to the Kickstarter model, VisionBakery allows founders access to the money raised provided that the funding goal has been reached. Otherwise, backers receive their funding back via bank transfer. The structure of the websites Kickstarter and VisionBakery is, as mentioned above, very similar to each other. In the center of the project website are videos (Kickstarter) and pictures (VisionBakery). The key information about the project is identical: the amount of backers, and the amount of pledged funding including the funding goal and the remaining time for funding. Kickstarter offers more details about the project owner than VisionBakery. The look and feel as well as the structure are very similar, and the project information and rewards offered appear in the exact same structure. An interesting difference is the updates feature. While Kickstarter has an own section just for updates in the description of an ongoing project, VisionBakery updates directly appear in the project description, with the amount of updates only counted in the database. And while Kickstarter has only the comments section, VisionBakery additionally offers the features of blog, questions, and backers, presenting the comments at the end of the website.

Variables

The following section describes the key variables in this study:

Web presence: VisionBakery allows founders to post a video, offering more detail about themselves and their project's aim on the project's description page. Here, founders can include several pictures in the explanation of their project. Photos of the project, the rewards, and the founder can provide additional information to interested funders and increase the project's credibility. Founders have the option of including a profile picture of themselves, or in case the founder is an organization, its logo. Profile pictures can add a level of personalization to the project and help potential backers identify with the founder or the founding organization. A link to the founder's or project's Facebook page, visible on the project description page or the founder's profile, facilitates access to the project's social network page. Interested backers can gain more information about the founder and the project and can easily create awareness of it through liking and sharing the page. In this article, these relevant individual aspects merge together into the term *web presence*.

Backers: The number of backers indicates the amount of people that have supported the project through its duration.

Updates and blog entries: VisionBakery encourages project founders to post and share updates about their project. Potential funders with an interest in the project and existing funders can gain more insight into the development of the project along with new information about project developments. Another option for interaction between the project owner and the backers is the blog. Experiences gained, news, and moods can be communicated by the project owner. The number of blog entries is recorded as well as the amount of updates.

Rewards/incentives: The number of different rewards/incentives backers receive as a way of saying thanks for support is part of the analysis.

Comments: Funders, potential funders, the founder, as well as administrative and support staff from the VisionBakery website can post comments about the project on the bottom of the description page. This then records the number of negative and positive comments, with the difference being comments from founders. The resulting continuous variable serves as an input for various statistical analyses in this study.

Analysis procedure

The following section describes the procedure of the analysis. Ragin (2008a) proposes that set relations in social research are central to social science theorizing, making analyses of set relations critically important to social research. As a result, the new fuzzy set qualitative comparative analysis method (fsQCA) has received significant attention from academics and practitioners (e.g. Bell, Filatotchev, & Aguilera, 2014; Chang & Cheng, 2014; Fiss, 2011; Misangyi & Acharya, 2014; Tóth et al., 2015; Woodside, 2013; Woodside & Zhang, 2011). Fiss (2011) has suggested that fsQCA is based on the analysis of set-theoretic relationships rather than linear relationships between variables, and that it can handle significant levels of causal complexity based on a configurational understanding of how causes combine and contribute to an outcome. Most researchers have employed a set-theoretic approach based on

fsQCA and focused on categorizing relevant antecedents (e.g. web presence or updates and blog entries in our specific case) into causal recipes for achieving high outcomes such as performance, profit, satisfaction or, in our case, the probability of successful crowdfunding projects.

Accordingly, this study employs a set-theoretic approach to explore how causal conditions (i.e. web presence, backers, updates and blog entries, rewards/incentives, number of comments) combine to contribute to an outcome (i.e. realized funding in percentage) by following Ragin's fsQCA guide (Ragin, 2008b) step by step. First, to transform ordinary data into fuzzy sets, this study follows Ragin (2008a, 2009) and Misangyi and Acharya (2014) to specify fuzzy set full membership (95%), cross-over anchors (50%), and full non-membership (5%). This study specifically sets the original values of the 95th percentile, 50th percentile, and 5th percentile from ordinary data to respectively correspond to full membership (fuzzy score = .95), cross-over anchors (fuzzy score = .5), and full non-membership (fuzzy score = .05).

In the second step, this study follows Chang and Cheng (2014), Fiss (2011), Misangyi and Acharya (2014), and Ragin (2008b) to construct a data matrix known as a truth table with 32 (i.e. 2^5) rows, where 5 is the number of causal conditions in this study. To construct the truth table, we set the frequency and consistency threshold. In terms of the frequency threshold, Ragin (2008a, 2008b) indicates that the frequency the researchers specified should have at least 75–80% of the cases included in the analysis. In terms of the consistency threshold, Fiss (2011) suggests that the acceptable consistency should be above the minimum recommended threshold of .75, and Misangyi and Acharya (2014) proposed that minimum raw consistency was .80. In line with this literature, this study specifies the frequency threshold as 10 and the consistency threshold as .85.

While specific analysis and standard analysis are two possibilities for each analysis, Ragin (2008a, 2008b) strictly recommends standard analysis because this is the only way to generate the intermediate solution (partial logical remainders are incorporated into the solution). In standard analysis, there are three solutions (i.e. complex solution, parsimonious solution, and intermediate solution) for each analysis. Ragin (2008a, 2008b) further suggests that these solutions are based on a different treatment of the remainder combinations (i.e. there is no logical remainder used in the complex solution, although all logical remainders are allowed in the parsimonious solution without any evaluation of their plausibility), recommending the intermediate solution. This study thus attempts to combine relevant conditions into various causal recipes for exploring the configurations to achieve high realized funding in percentage based on intermediate solutions.

Results

Table 1 displays the intermediate result produced from fsQCA. Note that the parsimonious result is exactly the same as the intermediate one, indicating that the conditions of the causal paths in Table 1 are central conditions rather than peripheral (see details in Fiss, 2011).

Table 1 – Causal configurations sufficient for achieving funding in percentages.

Conditions	Outcome = achieved funding in %		
	Path 1	Path 2	Path 3
Web presence		○	●
Amount of supports/backers	●	●	●
Updates and blog entries		●	●
Rewards/incentives		●	○
Number of comments	●		
Raw coverage	.43	.37	.31
Unique coverage	.14	.06	.05
Consistency	.86	.91	.90
Solution coverage	.61		
Solution consistency	.85		

Notes: Black circles (●) indicate the presence of causal conditions (i.e. antecedents). White circles (○) indicate the absence or negation of causal conditions. The blank cells represent “don't care” conditions.

Three causal configurations are found to be sufficient for high achieved funding in percentage with acceptable consistency levels. The consistency index serves as significance (Ragin, 2008a) and supports an argument of sufficiency (Ragin, 2009). In addition, the unique coverage for each causal path recognizes that each path offers a unique contribution to the explanation of the crowdfunding success. Coverage, like strength, measures the extent to which the configuration accounts for the outcome (Ragin, 2008a). In short, these three solutions constitute a high consistency (.85) and explain over 60% of the outcomes.

The solutions in Table 1 indicate that the amount of backers is evidently the most important condition for high achieved funding in percentage. This is a necessary condition regardless of how other conditions combine. Put more specifically, more backers represent more cash flow. The amount of backers and the number of comments jointly constitute a causal path to successful crowdfunding without regard to other conditions (i.e. path 1). The comments can be regarded as the public statements from a brand's spokesperson, and thus function as a marketing tool for influencing the potential backers' perceptions of respective projects. Founders can also update information on their projects via comments. Accordingly, path 1 with the highest unique coverage signifies that the breadth and the depth of the crowd's interest are sufficient to achieve funding. While the amount of backers denotes how many people show interest in the projects (i.e. the breadth), the number of comments represents how much attention people can pay to the projects (i.e. the depth).

However, when the number of comments is not taken into account, founders' updates and blog entries become more significant (see path 2 and path 3). In other words, founders need to maintain the crowd's interest by updating relevant information about the projects on their blogs. Web tools such as videos, pictures, and Facebook appear to play an important role in updating information and keeping the crowd's interest. Again, when founders lack these tools, they need to design an incentive plan for backers to enhance their interest (path 2). On the other hand, when founders are incapable of offering

rewards or incentives to potential backers, they have to effectively utilize web tools in order to grab the crowd's attention (path 3).

Furthermore, a comparison of path 2 and path 3 shows that these configurations involve a pattern of substitution. Web presence and rewards/incentives here appear to substitute for each other. Simply put, the presence of one of the conditions combined with the absence of another constitutes a part of causal conditions. While the web presence represents an intangible pull for attracting the crowd's interest, the incentive plan acts as a tangible motivation for encouraging the potential backers to take action. These two conditions cannot be present simultaneously when achieving successful crowdfunding.

A comparison across all solutions also reveals that the number of comments can substitute for the portfolio of web presence, updates and blog entries, and rewards/incentives. Because founders can also market their projects or update information by posting comments, this means that they have no need to focus on marketing their projects by using web tools, updating information, or designing the incentive plan when they frequently post comments. In sum, these solutions indicate that these conditions are critical factors, even though founders should appropriately combine these conditions to achieve funding.

Discussion

The following discussion comes from the two-part literature review of success factors in preparation of and during the crowdfunding project and the insights gained through our analysis.

Crowdfunding is fundamentally changing the way new projects access funding. In daily business, the focus is very much on equity-based crowdfunding projects. However, reward-based campaigns have quickly become the dominant type of crowdfunding all over the world. In 2012, 14% of funding volumes were reward-based, compared to 4% of equity-based crowdfunding (Wilson & Testoni, 2014). Part of this high growth can be attributed to the agile nature of reward-based campaigns, where the return on the contribution – be it a product, service, or acknowledgment – is clear and defined a priori, not bound by the exit liquidity concerns of an equity investment.

In answer to the research question, it is important to remember that success factors during the projects are multi-layered. Mollick (2014) finds that social network size as well as the project's quality relates to project success. Hence, communication of crowdfunding projects appears to be a key element for their success. We find that videos, pictures, blogs, and other online elements in many cases play an important role, as expected by the analysis of earlier research. However, the relationship to the crowdfunding campaigns' success is not automatically positive, and sometimes is even negative: in path 1, there is no influence; in path 2, it is an inhibiting factor, while in path 3, it is a main argument for success.

So depending on the causal configuration of realized projects, it does not always make sense to use all available communication instruments. This is in several cases

contradictory to earlier research: [Wheat et al. \(2013\)](#) and [Mollick \(2014\)](#) found the lack of a video to be negatively related to crowdfunding success. [Boef et al. \(2014\)](#) as well as [Colombo et al. \(2015\)](#) point out that a picture of the project owner boosts the probability of successful projects. [Belleflamme et al. \(2014\)](#) highlight the importance of Web 2.0 and social networks, while [Antonenko et al. \(2014\)](#) research that successful projects are positively affected by intensive communication on the project website, reacting promptly to questions, posting own questions, and giving frequent status updates. The importance of updates is supported by [Xu et al. \(2014\)](#): projects with frequent updates can almost double the probability of successful funding. Regarding the use of social media, earlier research reveals different directions as well. [Belleflamme et al. \(2014\)](#) note that social networking activities do not raise the funding amount. On the other hand, [Lu et al. \(2014\)](#) argue that social networking, especially in the early stage of the project, can strongly raise the probability of successful project funding. [Byrnes et al. \(2014\)](#) highlight e-mailing to social networks as a driver for successful projects.

When it comes to incentives, we can only partly support [Steinberg \(2012\)](#) and [Colombo et al. \(2015\)](#) who identify incentives as the key elements of a successful crowdfunding project. We even find all three possible variants: rewards can be key for success (path 2), can have no influence (path 1), or can even be harmful (path 3). This might be explained in general by the fact that incentives are expected in any case by those involved ([Wheat et al., 2013](#)). Especially in the case of path 3, it might be just too much to do extensive communication with videos, pictures, social media, updates, blogs, etc. when supporters are sufficient in the first place.

The only constant success factor for crowdfunding success is the number of supporters and backers, who may receive either material rewards ([Vukovic et al., 2009](#)) or immaterial rewards in the form of social acknowledgment ([Kazai, 2011](#)). This supports the research done by [Colombo et al. \(2015\)](#). This support is considered to be a key success factor in all of the paths.

With the three different paths for successful crowdfunding projects in mind, this strongly confirms the adapted communication theory of crowdfunding based on the original theory of communication by [Schulz von Thun \(2000\)](#). The heterogeneity of the crowd requires a broad information approach. As a result, renouncing one of the four elements (detailed description of the project including pictures or videos; personal information about the project owner; networking; and a call for action) may undermine the success of a project.

It finally is important to remember that earlier research did not have such a broad approach when it came to analyzing crowdfunding success. So this might be the reason why their results differ in individual sections.

Implications for practice

Reward-based campaigns provide funders the opportunity to pre-purchase a product or service, and the reward structure often also includes the option to support the project through a donation without actually pre-purchasing any product or

service. This different reward structure offers options to founders to establish different relationships with their audience: some funders fit well into the potential customer profile, while others take the profile of a fan or project supporter. While the pre-purchasing customer profile might behave in accordance with new product launch marketing theory, the additional source of variation introduced by the fans of a project (regardless of whether they are pre-purchasing or not) changes the dynamics of the crowdfunding campaign evolution, modifying what would otherwise be a classic marketing plan for a new product or service.

Based on prior research on crowdfunding dynamics, we expect to see campaign success determined by whether there was a strong (funding) wave as the project started ([Etter, Grossglauser, & Thiran, 2013](#)), together with the surge of a high (social) networking effect – virality of the project – that would drive the project funding through to completion ([Mollick, 2014](#)). What we find is that the crowdfunding campaign dynamics are far more complex, especially in terms of the influence of crowdfunding communication approaches, which the last section of this paper discusses.

With our results in mind, we propose a typology of crowdfunding campaigns for future consideration:

- (a) Communicator: this type yields a strong social network and fans, using online marketing and public relations. It helps the project to “turn heads.” Nevertheless, a lackluster product or service keeps visits-to-contributions ratios low, and most of the funds come from symbolic contributions and/or reward offerings. Put another way, the communicator is rewarded for his/her strong effort as part of a rather weak project. This strategy comes from path 3 identified in our research.
- (b) Networker: funders start building virality through their personal network and their community, and the project gradually draws more attention as founders manage to fit their offering to what ticks with their audience through blogs and updates. Summarizing the networker, the focus is on already-known potential founders and the intensive work with them, keeping the information flow running and offering attractive rewards. This approach can be referred to as path 2.
- (c) Self-runner: an attractive product is the driver of virality with an active community of backers; the success of the launch gets media attention, a high number of comments, and brings additional fans to the project in addition to the potential customers. It appears here that the product is simply outstanding, and therefore no self-determined online activity is needed to lead the project to a successful funding. The work for this kind of project appears complete before the crowdfunding project starts, with the campaign seen as given. Here, path 1 serves as a basis.

It is therefore important before starting a crowdfunding project to consider which strategy fits best with the idea, and the founder or the founding team in particular. A distinctive use of communication tools like social media, pictures, rewards, etc. is achieved based on this decision.

The chart below ([Fig. 3](#)) summarizes the findings in this article, and serves as a basis for practical guidelines which are

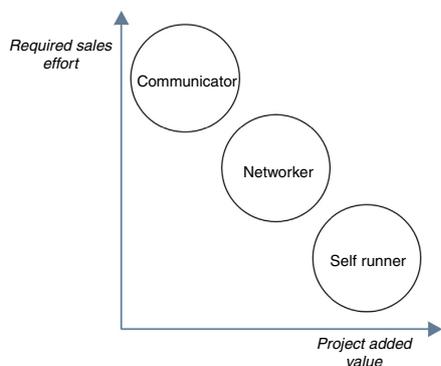


Fig. 3 – Typology of crowdfunding campaigns.

useful for the choice of a strategy. The axes are required sales effort and project added value.

The following practical guidelines for future project owners can be derived based on this threefold division:

Start creating new projects with the simple goal of generating added value for third parties, not for the project owner. Added value can be multi-layered, and include everything from knowledge, entertainment, experiences, emotion, or quality of life.

Get a feeling for the project. Start discussing the idea in a very early stage with your close peer group in an effort to identify market demand and optimize the project. Do this, and it will be easy to recognize a “Wow!” project and a “tough” project.

Keep the desire for continuous development, for example with the help of sample through-runs, fixed feedback routines, pre-testing, or re-designing the project if needed. Consequently re-examine the project. Most of the hard work comes before the crowdfunding project is even online.

Win the crowd before starting the project online. Start the communication with family, friends, and colleagues early – they are crucial for the first stage of the campaign and therefore for the degree of attention to the whole project. If you feel strong restraints, invest time and effort in offering attractive rewards and setting up online tools.

Create constant updates about optimization, news, innovation, experiences, and feedbacks – the crowd will show their appreciation for improvements and a consistent work ethic via their funding.

Limitations and further research

As with every research, our approach has some limitations. First, we focus our analysis on a reward-based platform. If the same analysis examines another platform, for example with an equity-based or donation-based focus, results might differ. Applying our approach to other types of crowdfunding platforms, especially in an international and interdisciplinary context, might bring new insights into the topic of crowdfunding

success. To be sure, this is the main shortcoming the authors see with this research, as equity-based crowdfunding investors will definitely have different motivations to invest than people interested in reward- or donation-based projects. Another point is that we only have objective data available, that is, observations from VisionBakery's website. Participants however could state why they choose to invest in specific projects. Here, additional qualitative research, for instance interviews with investors and companies, is a good idea. Our findings are generalizable to a limited degree because the data collection stems from a single website and its research focus is set on Germany. Comparisons with platforms from other European countries might contribute to a better understanding of the link between crowdfunding motivation and the local economic situation. In any case, the shortcomings here ultimately offer interesting avenues for future research.

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Publication VII

Kraus, S., Ferreira, J., Richter, C., Breiteneker, R., and Brem, A.

Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs

Under Review

International Entrepreneurship and Management Journal

Directing the wisdom of the crowd: Key success factors for crowdfunding-based financing opportunities for entrepreneurs

Introduction

After the great economic crisis from 2008 on, especially small organizations and entrepreneurs found it difficult to buoy up in terms of receiving funding for their projects (Absatzwirtschaft 2015; Gompers and Lerner 2004; Prive 2012). Especially for innovative projects, entrepreneurs suffered a lack of funding in an early stage (Cosh et al. 2009). This lack results from the difficulty of entrepreneurs to offer investors a credible and detailed information basis in order for investors to estimate the risk of their investment decisions (Moss et al. 2015). In addition, the crisis had led to a questioning of conventional financing methodologies while additional sources of funding were needed since the barriers to receive credits from traditional finance institutions grew. Therefore, crowdfunding emerged (e.g. Kleeman et al. 2008; Unterberg 2010; Wenzlaff et al. 2012) as an enabler for businesses of all kinds to present their projects and ideas to the world and receive funding for it (Fiedler and Horsch 2014; Zademach and Baumeister 2013). Crowdfunding is based on a transparency, which creates, in combination with web 2.0 and social networks, effects of viral marketing (Blohm et al. 2014). It "uses collective decision making via a social media platform to evaluate and raise financing for new projects or new commercial ventures" (Bruton et al. 2015, p. 12).

The rise of crowdfunding is reflected by its statistics as the crowdfunding volume is extremely increasing. From 2012 to 2013, the crowdfunding volume grew over 51% (5.1 billion US dollars total) (Massolution 2013; Statista 2015a). Due to an estimate of the crowdfunding platform *Fundable*, between 2013 and 2014 the volume increased 90% to 100 billion US dollars (Blohm et al. 2014). The number of crowdfunding platforms rose over 60% in 2012 alone (Statista 2015b). By 2020, the global crowdfunding volume is estimated to rise up to 35 billion US dollars which equals an CAGR of about 30% (Wardrop et al. 2015).

During the past years, crowdfunding has been much more prominent in the United States than in other highly developed countries, e.g. in Europe, represented by a coverage of 59% of the global crowdfunding volume by the United States and 35% in Europe (Massolution 2013). Recently, in global comparison, crowdfunding has been booming especially in Europe. The location of the main growth pole therefore switched. Due to a recent publication of the University of Cambridge and Ernst & Young, the revenue of European crowdfunding platforms increased by 144% between 2013 and 2014. Still, up to today, in Germany crowdfunding is less distinguished with crowdfunding revenues of 150 million Euros compared to 2.3 billion Euros in the United Kingdom in 2014. By 2020, the crowdfunding volume in Germany is forecasted to rise up to 359 million euros (Wardrop et al. 2015).

Parallel to the strong growth of crowdfunding in general, focal areas of incentives are extending. First, the approach was applied in creative industries for projects of artists or films but quickly gained as much attention as more and more sectors began to use crowdfunding (Bradford 2012; Meinshausen et al. 2012). In 2012, 30% of the incentives were contributing to social causes followed by 28% other and about 17% business & entrepreneurship (Statista 2013). With business & entrepreneurship being one of the three most distinguished sectors of crowdfunding, it is shown that crowdfunding is particularly used by entrepreneurs (e.g. Schwienbacher and Larralde 2012). For entrepreneurs, the success of an incentive more likely represents a crucial factor for

economic success, critical success factors influenced by crowdfunders are of high relevance. It is accepted, that the success of a crowdfunding incentive can be influenced by the project owners, the crowdfunders with factors such as topic of incentive, period of incentive or length of incentive description (e.g. Estellés-Arolas and González-Ladrón-de-Guevara 2012). Still, up to today, little is known about fostering or impeding factors of crowdfunding projects.

Due to crowdfunding being a recent phenomenon, the scientific research base on the topic is scarce (Estellés-Arolas and González-Ladrón-de-Guevara 2012). Scholars started to focus on research on the topic from 2010 on (Moritz and Block 2014) and so far predominantly focused on definitional issues and affiliations to superordinate topics as crowdsourcing (Estellés-Arolas and González-Ladrón-de-Guevara 2012) or financial aspects of using crowdfunding (e.g. Schwienbacher and Larralde 2012). Little empirical contributions have been made as crowdfunding had to be recognized and understood as a first step. As mentioned above, the United States represent the country, for which research from a scientific perspective is most developed (Kappel 2009; Mollick 2014a) due to this geographic area representing the origin of crowdfunding (Blohm et al. 2013). The world's biggest crowdfunding platform Kickstarter is situated there (Kickstarter 2014). Less research so far focused on other highly developed countries with an emerging number of entrepreneurs such as Germany.

Thus, this paper's objective is to contribute to scientific research on crowdfunding as a financing opportunity for entrepreneurs by aiming at four different research gaps. First, we will study success factor for crowdfunders empirically. Second, this paper particularly addresses Germany by investigating the success factors of crowdfunding (Leimeister and Zogaj 2013). Third, our empirical study focuses on entrepreneurs only as one of the most important user groups. Fourth, we will discuss our findings on success factors in crowdfunding for entrepreneurs in comparison to the current state of research. Since this state of research focused on the United States, we will compare our results for Germany with the United States in particular.

The paper is structured as follows: After this introduction, the current state of scientific research is summarized in a second section as a basis for further discussion. Third, the data basis and methodology of research are being presented. The chosen variables and their effect on the analysis are discussed in a fourth section. Subsequent to the essential findings of the survey conducted, these findings are considered. An outlook on future research and a conclusion will finalize this work.

State of research

Even though crowdfunding is a young approach, it is derived from different concepts in the scientific literature. In some cases, it is regarded as one part of crowdsourcing with *crowdvoting* and *crowdcreation* as the second and third part (Leimeister and Zogaj 2013). Crowdfunding is understood as the outsourcing of specific tasks to a group of individuals (Bretschneider and Leimeister 2011). Other authors refer to micro-finance (Murdoch 1999) or micro-lending (Vitale et al. 2003). These two approaches are associated with the idea of funding persons, with typically no access to conventional sources of funding from financial institutions (Armendariz and Murdoch 2010).

A number of studies have been conducted on the topic of crowdfunding in recent years, but definitions vary. Most existing definitions follow a general approach (Belleflamme et al. 2010; Fiedler and Horsch 2014; Tomczak and Brem 2013). Predominantly, definitions comprise the process of receiving financial funding from a group of people via Web 2.0 (Ribiere and Tuggle 2010). As this work focuses on crowdfunding for entrepreneurial ventures, we follow the most recent definition by Mollick (2014a, p. 2):

Crowdfunding refers to the efforts by entrepreneurial individuals and groups - cultural, social and for profit - to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries.

The empirical study of this article is concerned with success factors of crowdfunding projects on platforms in Germany. Therefore, the literature review will focus on the actors involved in the crowdfunding process as their interaction and motivation has the highest impact on a crowdfunding projects success.

In order to analyze the influencing factors from a full, detailed perspective we propose a three level approach (see figure 1). We expect success factors to differ and depend in their extent on the point in time of the project.

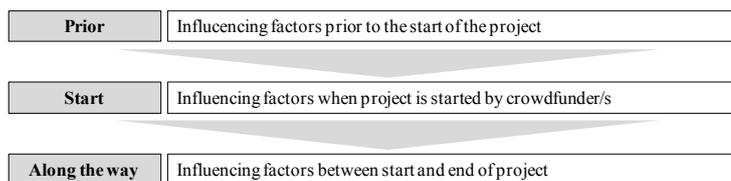


Figure 1 Three level approach of success factors from a crowdfunder's perspective

We distinguish between a point in time prior to the project, when the project is started and during the elapsed time of the project. The first level is currently not fathomed in the state of research. The second level, when the incentive has been started by the crowdfunder, influencing factors for investors concerning the project description, running time of the incentive, amount of requested money etc. become relevant. This level is the one, which research has focused on the most in comparison to the other levels in recent years (Estellés-Arolas and González-Ladrón-de-Guevara 2012). Mollick (2014a) has published his research on these influencing factors with the title "tapping the right crowd" for the United States. Still, little research has been conducted on these influencing factors and no research for Germany in particular. The third level of influencing factors focuses on factors with relevance from start to end of an incentive, e.g. comments, posts on social media or updates. In this concern, Mollick (2014a) had included some aspects in research in the United States. A perspective of different influencing factors during the process of an idea becoming a crowdfunding incentive has not yet been applied. This three level approach will serve as a basis for the following remarks in this study.

Following the current state of literature, two groups of actors are involved in the two-sided market of crowdfunding (Eisenmann et al. 2006). The investors are the subsidy-side, funding the money-side, the crowdfunders (Osterwalder and Pigneur 2010). They underlie different influencing factors for participating in crowdfunding. Since the success of a project depends on the amount funded by investors, critical success factors as a focal area of this paper are adapted to investors. The state of research on investors will be presented in the following, taking our three level approach into account.

Crowdfunder

Especially small companies or entrepreneurs struggle with the access to external funding. Before forms of micro financing emerged (Murdoch 1999), these companies and their economic growth relied on the accessibility and quantity of internal financial resources (Carpenter and Petersen 2002). With crowdfunding, crowdfunders can access a market while raising external money at the same time (Burkett 2011). The variety of types of

crowdfunders is high: whole industries (Grier 2011), companies of different sizes (Burger-Helmchen and Penin 2010) or non-profit organizations (Brabham 2009) acted as crowdfunders in the past. So far, companies as crowdfunders have been a focus of scientific research in the past (Moritz and Block 2014). Entrepreneurs as crowdfunders are less fathomed, even though entrepreneurs prefer this kind of funding with low risks (Hemer et al. 2011; Kuppuswamy and Bayus 2014). Predominantly, crowdfunding projects focus on small projects, asking for a funding of 1.000 US dollars for one particular initiative. Still, the importance of crowdfunding for entrepreneurs is shown by 42 funded projects of the fifty highest funded projects on the global leading platform Kickstarter were initiated by an entrepreneurial venture (Bruton et al. 2015). Besides the funding aspect, crowdfunding implies the advantage of testing market acceptance of a new product. If no or only a small amount of funding is contributed by the crowd, the project fails before a lot of capital is invested or even already produced and tested on the market. Furthermore, the potential customer base is increased leading to higher revenue. Thus, market potential can be identified and used more efficiently (Belleflamme et al. 2010). Kleeman et al. (2008) identified a rising relevance of feedback for crowdfunding incentives from the crowd. In addition, Crowdfunders receive access to a wide range and variety of knowledge of the crowd (Colombo et al. 2015; Surowiecki 2004).

To start a crowdfunding project, crowdfunders have to apply to the platform with detailed information on the project or on the company such as homepage, pictures or videos (Belleflamme et al. 2011; Bruton et al. 2015). In theory, barriers or requirements for crowdfunders to become involved in crowdfunding are low (Estellés-Arolas and González-Ladrón-de-Guevara 2012).

The willingness to self-market your idea, project or company is the only essential requirement (Pelzer et al. 2012). In practice, in order to initiate a crowdfunding incentive, detailed information needs to be given to the intermediary, platform, on the project demanding for funding (Belleflamme et al. 2011). Following the signaling theory, decision makers of investments need public as well as private information in order to make an investment decision as a high information asymmetry between crowdfunder and investor influences the decision negatively (Moss et al. 2015). As crowdfunding is regarded as a composition between traditional investment decision making and emotions, the information provided needs to aim at both requirements of investors (Galak et al. 2011). It is uncertain which private information fosters a positive investment decision the most due to the dependence on individual preferences (Moss et al. 2015) - while one investor is not interested in the personal background of the entrepreneur others are positively influenced. Still, two types of private information are of particular relevance due to signaling theory: (1) characteristics of crowdfunder and (2) the intention (Stiglitz 1990). Investors prefer to have private/personal information on the project owner - individual and company - as they perceive a more realistic assessment of a funding success (Bruton et al. 2015), for example the picture of the crowdfunder or number of projects already published and their funding success. Investors tend to contribute to projects and therefore also project owners they believe in and identify an emotional attachment to the project (Schwienbacher and Larralde 2012). As mentioned above, investors mostly spend money on social projects (Statista 2013). Information on ethical motivations or values are decisive for crowdfunders to provide - the overall project goals needs to be detailed in order for the project to become tangible and concrete for the investor (Payne et al. 2013). Thus, the crowdfunder as the project owner as well as the project goal become a critical success factor besides the industry supported. Therefore, the information the crowdfunder provides in the description is decisive for the funding success (Estellés-Arolas and González-Ladrón-de-Guevara 2012). After

the information is filled in by the crowdfunder, the platform then decides on publishing the project or declining it.

Crowdfunders can further influence the likeliness of their incentive (rewards) to be fully funded by their characteristics (Moritz and Block 2014). Investors find interest in incentives, they seek to be implemented (Belleflamme et al. 2013). The composition of rewarding is connected to the kind of decision making of crowdfunding (Galak et al. 2011). Investors are motivated by extrinsic and intrinsic factors (Cholakova and Clarysse 2015). On one hand, investors decide on a traditional basis by estimating their financial rewards but on the other hand incentives with a social motivation or emotional connection are often prioritized (Allison et al. 2015). Further influence takes the period of funding (duration in days) as well as the amount. Between 30 and 90 days is the usual period for crowdfunding incentives (Mahlstede 2012). In case this duration is exceeded, the likeliness for the incentive to be fully funded decreases (Estellés-Arolas and González-Ladrón-de-Guevara 2012). A further factor for a funding success is the requested amount of funding by crowdfunders, as the investors have a fixed amount, defined prior to the investment decision (Schwienbacher and Larralde 2012).

The presented factors predominantly relate to the second level of success factors as the information (e.g. project details/goal, duration, industry) are provided when the project is started on the crowdfunding platform.

Investors

The group of investors are the crowd, who "[...] decide to financially support these projects, bearing a risk and expecting a certain payoff" (Ordanini et al. 2011, p. 5). Thus, the kind of *rewarding* influences the decision to participate in crowdfunding. Usually, each member of the crowd is a registered user on the crowdfunding platform as information on the incentive needs to be provided (Baba et al. 2014). The likeliness of an individual to participate in crowdfunding as an investor is rising with the *number of projects already supported* and their *funding success* (Leimeister 2012). Individuals tend to be skeptical concerning investing money under high uncertainty and via an online platform. The previous activity on crowdfunding platforms or even entrepreneurial websites can therefore be regarded as an indicator for the likeliness of investors to participate in crowdfunding (Brabham 2008). Still, the lower barrier of the younger generation of digital natives might relate the influence of the *number of projects already supported* as a factor to invest for the *funding success*. This generation grows up in a digitalized world in which they share information and possibly also money (Sixt 2014). Every member is participating anonymously (Poetz and Schreier 2009). Investors are characterized as intelligent and qualified persons (Howe 2008). There is no necessary qualification for the investors in terms of knowledge or solvency (Schenk and Guittard 2011).

As for crowdfunders, social motivation is most relevant for the investors whereas financial rewarding is less important (Lambert and Schwienbacher 2010; Richter et al. 2014). An essential success factor of an incentive is therefore the emotional connection to the project or company (Eickhoff and De Vries 2011). In most cases, investors are particularly motivated to fund when they regard the quality of the incentive as high (Mollick 2014a). Furthermore, social networks contribute highly to a decision for or against funding of an incentive by the crowd (Lawton and Marom 2010). If a crowdfunder or the project goal is positively referred to in social media, the likeliness for a crowdfunding project to succeed is increasing (Mollick 2014a). As mentioned above, investors need to be emotionally affected in order to participate in crowdfunding (Cholakova and Clarysse 2015). This affection can result from positive reactions in a social network they participate in such as *Facebook* or *blogs* on entrepreneurial websites (Schwienbacher and Larralde 2012). The closer crowdfunder, project and

investor are related via social networks, the more likely the funding success (Zheng et al. 2014). With a field study on a crowdfunding project, Brabham (2008) shows that 70% of the current investors had heard from the project via a *blog*. Furthermore, the *comments* by other potential investors during the run time of the crowdfunding project should be examined (Mollick 2014a). The outcome of the reaction on these networks, positive or negative, is of high relevance as it has an impact on the social motivation for crowdfunding investors. With an increasing number of potential investors, interested investors are more likely to contribute lower funding as they expect the incentive to be realized. Thus, the *number of investor* freezes or decreases and motivates the investors to finally contribute as they want to ensure the realization of the incentive (Smith et al. 2013).

Referring to the three level models of success factors of crowdfunding, investors are influenced on each level. Even before the incentive is started, they might question the credibility of crowdfunding and crowdfunding platforms. Not everyone willing to contribute to an idea or project is willing to contribute via an online platform (Gerber et al. 2012). Especially, subsequent to different scandals concerning web security, some potential investors are not willing to contribute via a web based platform. Thus, investors, who already have been active on crowdfunding projects are more likely to become an investor, since barriers non-specific for an incentive can be applied. On the second level, when the crowdfunding project is started, investors are influenced by the project itself and by the information on the project provided by the crowdfunder (see crowdfunder). During the current time of the crowdfunding project, reactions by other investors become decisive, such as *the number of investors*, *social media* or *comments* on the project page.

Overall, due to the current state of literature, the crowdfunder can fundamentally influence the success of his projects by the kind of information he/she decides to provide before and when the project is started. Barriers prior to the start of the crowdfunding project for investors are hard to be affected by crowdfunders.

Data and Methodology

Data

As an exploratory empirical study, the goal of this study and the analysis is to find out key factors during crowdfunding projects and the options for the project owner and entrepreneur to optimize these factors to lead the project to successful fundings. This method is well-accepted for emergent themes like crowdfunding, identified success factors can be used as base for discussion in the near future. Instead of challenging formal hypothesis, the goal of this work is to find links to existing literature, controversies and success or failure of projects (Mollick 2014a).

Trying to allow a broad approach to the field of crowdfunding, a general crowdfunding platform was chosen without a specific orientation, e.g. social crowdfunding, sport crowdfunding, art crowdfunding. Visionbakery is the second largest crowdfunding platform from Germany, Europe, which makes it a suitable model for this analyzes due to the size (Visionbakery 2015a), the amount of started projects, the closeness and comparability in technical orientation to the dominant crowdfunding platform in the world (Kickstarter), and the 5 years of existing since 2011 (Visionbakery 2015b).

We considered all 446 started projects from Visionbakery since the start of this crowdfunding platform in 2011. We eliminated projects from our sample with incorrect or insufficient information. Thus, our final sample of crowed funding projects consists of of 432 funding projects comprising of 231 (53.5%) successful funded and 201 (46.5%) non-funded projects.

Measurement

We collected data in a two-step process. After receiving the origin data set by Visionbakery, the data set was expanded through individual visual inspection on the project web page. This exercise was accomplished by two authors, following the four-eye principle to secure validity and correctness. With regard to the qualitative content analysis (Mayring 2000), the researchers followed an inductive approach to evaluate information on project web pages and to form appropriate variables. We considered 16 different aspects in this study:

Funding success: Funding success is the dependent variable. We measure funding success with a dummy variable. The variable has the value one if the project is successful (targeted amount of money was reached) and zero if the sum of investments could not reach the predefined level.

Other projects: Variable captures if the project owner has or had crowdfunding projects already started before. The dummy variable has the value one if a project owner has started one or more crowdfunding project before and is zero otherwise.

Number of projects supported: The numeric variable capture on how many other projects the project owner has invested.

Industry: Projects are categorized by Visionbakery. Due to the enormous level of detail, the article subsumed into seven different categories and differentiates into “art, theater, design & fashion”, “movie and photo”, “music”, “social”, “events”, “games (sport and dance)” and “other”. Therefore we measure industry with a nominal variable which is represented by six dummy variables in the regression analysis. The largest category “art, theater, design & fashion” builds the reference group in the regression analysis.

Person / project owner: A distinction is made according to the sex of the project owner (male, female), registered unincorporated associations, enterprises and others. In the regression analysis we consider if the project initiator as a private person or an organization. The dummy variable takes the value 1 if the project owner is an individual person and 0 otherwise.

Project goal: The desired amount of funding, which is defined by the project owner. Visionbakery only allows the distribution of the funding, insofar the predefined project goal was achieved. Otherwise, the money transfer is cancelled. This tough knock-out criterion reprimands the project owner to set realistic goals – high enough to finance the project idea and stimulate the crowd, low enough to allow a cash flow. The project goal is measured in thousand Euros.

Pictures: Pictures sometimes tell more than words, following this saying, explaining pictures for the projects are counted. The dummy variables pictures take the value of one if there are one or more pictures to support the funding project and zero otherwise.

Facebook: Facebook represents a social media platform and options to present and advertise the crowdfunding project. Attention can be gained, unknown persons can be reached. The dummy variable Facebook checks the presence of a separate Facebook link for the project. The variable has the value one if there is a separate Facebook link on the project webpage and zero if otherwise.

Homepage: An additional homepage is a further option of presenting the information around the crowdfunding project. This dummy variable checks the presences of an individual homepage for the project and takes the value one if there is a homepage and zero otherwise.

Video: Visionbakery encourages the project owner to produce a video to introduce the project to a broader audience. Videos can be used, like pictures, to explain different aspects without long words, emotions

can be created easily. We checked the presence of videos. The dummy variable has the value one if one or even more videos are present on the project site and zero if no video could be found.

Picture of the project owner: A picture of the project owner shows more, deeper information about the person. In case of registered clubs, enterprises or others, the logo is the equivalent of the picture. We capture the presence of a picture of the project owner or a logo of the organization by a dummy variable. The variable takes the value of one if there are pictures or logos to support the funding project and zero otherwise.

Duration in days: The defined duration of a project is analyzed as well. Too short may be perceived as too self-confident, too long may be perceived as not convinced by the own project. The numeric variable *duration* measures the days the funding project is open for funding.

Rewards: We analyzed the amounts of offered incentives as well. Rewards can encourage backers to give money in return of an attractive incentive, personal or material. We measure with this numeric variable the number of different rewards offered to investors.

Updates: Project owners are supposed to inform the crowd about new developments, tendencies or modifications of the project. This job is time consuming, could be perceived as caring and dedicated. We use a dummy variable to measure if the project information was updated one or more times (1) during the funding phase or not (0).

Comments: Right below the project presentation, there is the chance for the project owner and the crowd to comment on the specific project. Supportive comments or displeasure are not distinguished in this specific case. We capture with a dummy variable if there are comments or not from potential investors or project owners. The variable takes the value one if there are one or more comments and zero if no one comments on the project.

Blog: The blog section is another option for the project owner to inform the crowd about new developments around the project. The blog provides a very individual one-way communication by the project owner, the content is multilayered (e.g. updates, impressions, news, information, pictures). The analysis checks with a dummy variable the presence of a blog. The variable takes the value one if there is a blog and blog entries and the value zero otherwise.

Method

We applied a two-step approach to identify influencing key factors. First, we run bivariate tests to identify variables, which show differences concerning crowdfunding success. In case of nominal variables, we applied Chi-squared statistics and in case of numeric variables, we run independent t-tests (Welsh's t-test in case of unequal variances) to analyze differences of mean values concerning successful and unsuccessful fundraising. Second, due to the dichotomous character of the dependent variable *funding success* (0=non funding, 1=successful funding), we applied binary logistic regression analysis to identify the most influencing key factors in crowdfunding projects. Thus, we model the probability of successful funding. To evaluate the goodness of fit of the logistic regression analysis we calculated pseudo R-square measures (Nagelkerke and Cox & Snell), the percentage of right classified data sets, and the area under the Receiver Operating Characteristic (ROC) curve (Hosmer and Lemeshow 2000). For all statistical tests in our study, we use the significance level of 10% as threshold to interpret a result as being significant.

In addition to the binary logistic regression analysis, we provide a table where we calculated, based on the logistic regression model, findings probabilities for each of the variables by changing one's variable values

and leaving the rest of variables the same. Thus, the change in probability means that we change the value of one variable in the reference model. The variables in the reference model have the following values: Each dummy variable takes the value zero and the numeric variables take the mean value. Table 4 describes how the probability of successful funding changes if one variables value is changed.

Findings

The bivariate tests to analyze differences concerning successful and unsuccessful crowdfunded projects indicate significant differences of twelve variables out of 17 variables. The tests of differences in mean values of the variables *number of projects supported*, *project goal*, *duration in days* as well as *rewards* indicate significant differences between successful funded projects and non-funded projects. Project owners of successful funded projects have supported more other projects than projects owners in non-funded projects have. Further, successful funded projects seem to have smaller project sums and the duration time of the projects is smaller than for non-successful projects. Concerning the number of provided rewards, the analysis indicate that project owners of successful funded projects offered more rewards than in non-funded projects (see Table 1).

Table 1: Summary and test of numerical variables

	Total sample	Funding success		Test of differences			
		no	yes	difference	t-value	df	p-value
mean	mean	mean					
	(std. dev.)	(std. dev.)	(std. dev.)				
Number of projects supported	0.59 (1.69)	0.30 (0.82)	0.85 (2.16)	-0.55	-3.575***	303.46	<0.001
Project goal	7.23 (38.79)	12.17 (57.25)	3.01 (4.08)	9.16	2.264**	201.76	0.025
Duration in days	43.33 (16.22)	45.01 (12.13)	41.76 (19.19)	3.25	2.133**	394.12	0.034
Rewards	7.39 (3.96)	6.60 (3.41)	8.01 (4.33)	-1.41	-3.775***	425.80	<0.001

Notes: Level of Significance: *** $p < 0.01$; ** $p < 0.05$

The test of bivariate relationships between categorical variables and successful funding show that there are significant dependencies related to the *project owner*. First, there is a significant relationship between funding success and the initiators of the project. Registered clubs (“e.V.”), enterprises and other organizations have a higher percentage of successful funded projects compared to individuals. Looking at the individual level, we tested differences concerning the *sex* of the projects owners. We could not identify significant differences between projects initiated by males’ and females’. For individuals level it seems that successful projects have a significant higher percentage of *pictures of the project owners* than non-successful projects. For the total sample, we could not identify any significant relationship between a provided picture and logo of the project owner. We detected a significant relationship between success of the funding project and supporting other projects launched at the funding platform (*number supported projects*). It seems that project owners who supported other funding projects can build up higher attention and awareness for their own projects.

The industry variable shows a significant relationship to project success. The percentage of successful funded projects is above 60% for projects in the *music* and *events* sector. In the industry group *movie and photo* as well as *social* the percentage of successful funded projects is higher than the percentage of non-funded projects. In contrast, the industry-groups “*art, theater, design*“, “*games, sport and dance*” and the mixed group with *other* industry related projects have a higher percentage (> 50%) of non-funded projects.

The existence of an additional *facebook* page has a significant relationship to funding success. In contrast, an external project homepage shows no relationship with successful funding. The presence of *pictures* also seems to have no influence to successful funding, as we could not identify a significant relationship.

Concerning the potential influencing factors in the between the start and the end of project phase, we can report the following test results. The variables *updates*, *comments* and *blogs* have a significant bivariate relationship to funding success. The tests and tables show that successful funded projects provide more updates than non-successful projects. Concerning the communication with potential investors, it seems that the more comments and blogs on the project page the more successful the project is (see Table 2).

Table 2: Summary and test of categorical variables

		Funding success				Total	Chi-Square	df	p-value
		no		yes					
		N	%	N	%				
Project owner	other	59	34.3%	113	65.7%	172	17.168***	1	0.000
	individual	142	54.6%	118	45.4%	260			
Pictures	no	68	48.9%	71	51.1%	139	0.472	1	0.492
	yes	133	45.4%	160	54.6%	293			
Comments	no	158	55.1%	129	44.9%	287	24.974***	1	0.000
	yes	43	29.7%	102	70.3%	145			
Other projects	no	181	48.5%	192	51.5%	373	4.381**	1	0.036
	yes	20	33.9%	39	66.1%	59			
Updates	no	125	64.1%	70	35.9%	195	44.128***	1	0.000
	yes	76	32.1%	161	67.9%	237			
Blog	no	126	63.3%	73	36.7%	199	41.800***	1	0.000
	yes	75	32.2%	158	67.8%	233			
Video	no	57	58.2%	41	41.8%	98	6.898***	1	0.009
	yes	144	43.1%	190	56.9%	334			
Industry	art, theater, design, ...	43	52.4%	39	47.6%	82	10.661*	6	0.099
	movie and photo	23	40.4%	34	59.6%	57			
	music	25	37.3%	42	62.7%	67			
	social	33	43.4%	43	56.6%	76			
	events	19	38.8%	30	61.2%	49			
	games, sport, dance	23	56.1%	18	43.9%	41			
	other	35	58.3%	25	41.7%	60			

Facebook	no	118	52.9%	105	47.1%	223	7.558***	1	0.006
	yes	83	39.7%	126	60.3%	209			
Homepage	no	68	51.1%	65	48.9%	133	1.634	1	0.201
	yes	133	44.5%	166	55.5%	299			
Picture of the project owner	no	17	60.7%	11	39.3%	28	2.422	1	0.120
	yes	184	45.5%	220	54.5%	404			
Total		201	46.5%	231	53.5%	432			
Sex	female	59	51.8%	55	48.2%	114	1.030	1	0.310
	male	91	58.0%	66	42.0%	157			
Picture of the project owner	no	22	78.6%	9	32.1%	28	3.455*	1	0.063
	yes	128	31.7%	112	27.7%	404			
Total (sub-sample)		150	55.4%	121	44.6%	271			

Notes: Level of Significance: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

The results of the goodness of fit statistics of the binary logistic regression model are satisfying. The Hosmer and Lemeshow is not significant and therefore indicates that the model fits the data well (Hosmer and Lemeshow 2000). The Nagelkerke pseudo-R-Square value and the Cox & Snell pseudo R-square value are about 0.346 and 0.259, respectively. The percentage of right classified data sets is about 72.9% and above the percentage of group membership of the largest group of the dependent variables (53.5% successful funded projects) which would be the percentage in case of random assignment. We also calculated the area under the ROC curve, which is about 0.797 and indicates acceptable discrimination of the binary logistic regression model (Hosmer and Lemeshow 2000).

The binary logistic regression analysis shows the following results. Concerning factors, which are already fixed before starting a crowdfunding project, the model indicate one positive significant coefficient for *number of project supported* (“*number supported projects*”). The number of projects supported by the project owner (either an individual or an organization) seems to have a positive influence on the probability to get the project successfully funded. The *number of additional funding project* (“*more than one project*”) is not significant and therefore seems to have no influence.

Concerning potential influencing factors, which have to be adjusted by start of the projects, the result shows five significant relationships. The coefficients of *project owner* and *project goal* are significant negative. Thus, individual persons as project owners are less successful compared to organizations. The targeted investment seems also to have an important impact on funding success. Concerning our results, projects with a smaller amount of money have a higher probability to reach the targeted investment.

The variable *rewards* show a positive significant relationship with funding success. Thus, the offer of rewards increases the probability to get a project successfully funded. It seems that there is a difference in funding success concerning the project related industry. Our results indicate that *social* projects (positive significant) have a higher probability to be successfully funded compared to all other industry categories. The variables *pictures*, *picture of the project owner*, *homepage*, and *video* show no significant relationship to funding success and therefore no discriminating influence between successful and non-successful funding.

Out of three potential factors, which can influence the funding during the project phase, only one shows a significant relationship in the logistic regression model. The variable *comments* show a positive significant relationship with funding success. The variables *updates* and *blog* are not significant (see Table 3).

Table 3: Results of the logistic regression analysis

Modell III (along the way)			
	B	Wald	Exp(B)
more than one project	-0.072	0.033	0.930
number projects supported	0.231**	3.963	1.260
Industry		8.469	
movie & photo	0.632	2.347	1.881
music	0.575	2.164	1.777
social	0.884**	5.416	2.421
events	0.555	1.594	1.742
games (sports and dance)	0.396	0.796	1.486
other	-0.044	0.011	0.957
Project owner	-0.835***	10.462	0.434
Project goal	-0.128***	14.931	0.880
Pictures	-0.219	0.545	0.804
Facebook	0.335	1.895	1.398
Homepage	0.106	0.177	1.112
Video	0.387	1.424	1.473
Picture of the project owner	0.394	0.663	1.483
Duration in days	-0.013*	3.111	0.987
Rewards	0.061*	2.809	1.063
Updates	0.857	0.758	2.356
Comments	0.845***	10.933	2.328
Blog	0.214	0.047	1.239
Chi-Square Model	129.441***		
Homser & Lemeshow Test	7.267		
-2 Log likelihood	467.353		
Cox & Snell R-Square	0.259		
Nagelkerke R-Square	0.346		
Correct cases classified	72.9%		
Area under ROC	0.797		

Notes: Level of Significance: *** p < 0.01; ** p < 0.05; * p < 0.1

Binary logistic regression with dependent variable: Funding success: 0= "no funding" and 1= "funded 100% or more"

Number of observations: 432; Intercept omitted; Cut-value : 0.5

Table 4 shows the change in probability based on the binary logistic regression model for each variable change in comparison to the reference model. In the reference model - where all dummy variables have the value one, and all numeric variables take the mean value – the probability that the project get funded is about 14.5%. In contrast, the probability in the reference model that the project is not funded by the crowd and therefor is not successful is about 58.5%. Table 4 shows how the probabilities for successful funding and non-successful funding changes, if the value of one variable is changed. The results indicate e.g. that existence of *videos* and a *picture or logo of the project owner* increases the probability of successful funding from 14.5% in the reference model to 20%. *Updates* and *comments* on the project homepage also increase the probability of success up to 28.6 and 28.4%. Table 4 also highlights that a change in the desired amount of funding has influence on project success. The probability of project success increases e.g., when the project goal is set to 1,000 Euros compared to the mean value of 7,234 Euros. In contrast, the probability of project success is declining to approximately zero if the project sum, is about 50,000 Euros and all other variables are kept constant compared to the reference model.

Table 4: Change in probability of successful (non-successful) funding

Probability of ...	Successful funding	No funding
Reference Model	14.5%	85.5%
more than one project (yes)	13.7%	86.3%
number projects supported=0	15.8%	84.2%
number projects supported=5	37.2%	62.8%
Industry		
movie & photo	24.2%	75.8%
music	23.2%	76.8%
social	29.2%	70.8%
events	22.9%	77.1%
games (sports and dance)	20.2%	79.8%
other	14.0%	86.0%
Project owner (individual)	6.9%	93.1%
Project goal = 1,000 Euros	27.4%	72.6%
Project goal= 50,000 Euros	0.1%	99.9%
Pictures (yes)	12.0%	88.0%
Facebook (yes)	19.2%	80.8%
Homepage (yes)	15.9%	84.1%
Video (yes)	20.0%	80.0%
Picture of the project owner (yes)	20.1%	79.9%
Duration= 10 days	20.6%	79.4%
Duration= 80 days	9.7%	90.3%

Rewards= 1	10.3%	89.7%
Rewards= 10	16.6%	83.4%
Updates (yes)	28.6%	71.4%
Comments (yes)	28.4%	71.6%
Blog (yes)	17.4%	82.6%

Discussion and Conclusion

The goal of the study was to identify success factors for crowdfunding projects of entrepreneurs. Therefore, the findings are concrete and applicable success factors. The aspect “number projects supported” underlines the peer effect of crowdfunding. Supporting and getting supported, it is “give and take”. Supporting projects as official project owner shows commitment for the crowdfunding platform and for collaborators. It also emphasizes the social aspect of crowdfunding. Investments as project owner inclusively picture and full name may also encourage previously unknown and not reached investors to visit the own project page and get informed about the own crowdfunding project. Regarding the industry of crowdfunding projects, it is not surprisingly that social projects are stronger supported than other. Crowdfunding in general is built around the supportive and social idea (Mollick 2014b; Burtch et al. 2013). This approach and the will to do something good for the public, is even strengthened by the result, that mergers of people (e.g. groups, associations) have better chances to achieve the project goal in comparison to individuals. Individuals partly face the adoption of self-interest and own-benefit, justified or not.

Small project goals are another success factor. This fact is solely not very exciting, but the fact of achieving a successful first project even with a small project goal, is the foundation for further successful crowdfunding projects. Regarding to the Wall Street Journal (2015), project owners who have met the project goal on one project have a 73% chance to repeat it within the next project. Reasons are the increased awareness by potential investors and the crowdfunding community, comparable with loyal followers. Additional aspects are intangible: the increased self-confidence of knowing how to succeed, deeper experience and more preparation (Greenberg and Gerber 2014).

The aspect of Facebook integration as success factor is discussed controversial in the existing literature. Our results support the use and the maintenance of this social media tool to attract potential investors. Mollick (2014b) as basis for our article, also underlines the relevance of Facebook. Our findings support Mollick’s findings. Facebook can be used as communication channel with high reach, especially for previously unknown investors. Communication is considered as one of the central aspect of crowdfunding, because comments are identified as success factors as well. It could be interpreted that there is consistent communication and interaction.

Less surprisingly are the positive influence of rewards for the crowdfunding success, it underlines the existing findings, but does not represent a new added value.

Managerial and practical implications

Summarizing the findings and deriving practical and managerial implications, a clustering is recommended.

Table 5: Social aspects and framework of the findings

<i>Social Aspects</i>	<i>Framework</i>
<p><i>Supporting other projects:</i> Getting involved in the crowdfunding community and the specific platform. Show your commitment and support others – it underlines the aspect of cooperation.</p>	<p><i>Setting small funding goals:</i> Getting small things done, do not get greedy. Remember that successful projects lead to high attention, strong self-confidence, a certain number of loyal supporter for your next project</p>
<p><i>Funding as a group / association, not as a single person:</i> Team up! It supports your idea and you have your first supporter even in your own team.</p>	<p><i>Setting up short project duration:</i> Short projects indicate self-confidence. Use your network (Facebook, follower) to inform them before the official project starts, make them excited and shortage the amount of time.</p>
<p><i>Supporting social projects:</i> Private interests are “no go’s” – find projects with public interests. Convey enjoyment for others.</p>	<p><i>Offering Rewards:</i> Rewards are expected – offer it.</p>
<p><i>Using Facebook to keep the crowd informed and excited:</i> Use the viral and social aspect, getting in touch with foreign person and convince them with your idea.</p>	
<p><i>Generate comments and reply on comments to attract the crowd:</i> Ask questions, report of innovation and optimizations.</p>	

Our eight findings could be transferred to concrete implications, the probability of success increases significantly for project owners.

All in all, this study investigated potential success factors for crowdfunding projects of entrepreneurs on the base of 432 projects. To our knowledge, it is the first study that demonstrates clear practicable implications based on scientific work and statistical approximations. Our results show eight success factors for crowdfunding campaigns, which are able to be divided in social and framework factors. Considering the social factors, the aspect of “supporting other projects” must be highlighted, because with our knowledge, no other article could provide this success factor so far. The aspect of “teaming up” and secure the first investors out of your own group is also new, the factors “using facebook” and generate “comments” go in line with existing literature, in particular to our groundwork of Mollick (2014b). The factor “supporting social projects” is very obviously, because crowdfunding in general is about social togetherness, helping out each other, sharing ideas and supporting each other. The framework factors “setting small project goals” appear logically, as well as the factor “offering rewards”. Nevertheless, the result of achieving the project goal, even with a small goal budget, leads to higher self-confidence, more loyal supporter for upcoming projects and even deeper experience of sharing ideas and generating fundings. Funding goals higher than 50,000 Euro have only a 0.1% chance to succeed. In other words: avoid five-digit funding goals. The aspect “setting up short project duration” is interesting and goes in line with the literature, which already identified two strong funding periods: the early stage and the last days of a

project. So keeping the duration shortly, the own self-confidence is demonstrated to the public and secures statistically higher probability of success.

Future research on the field might concentrate on questions like:

- What is the relevant amount of supported projects to secure the probability of own success?
- What is the distinction by gender for individual project owner, which gender has higher chances?
- What could be relevant project goals after a successful crowdfunding project?
- What amount of rewards is purposeful? What is a relevant value of rewards (perceived and objectively in Euro)?
- Why are comments more relevant than blog entries?

While this paper contains several meaningful findings and concrete management (and practicable) implications, as any other research, it also holds a number of limitations. First, this paper works with rewards-based crowdfunding solely. The broader approach of crowdfunding (e.g. equity crowdfunding) is not considered. Second, the data set comes from a German-speaking area and includes only a fraction of the world, quite strong with the same attitude in matters of social challenges and the way of life. Third, subjective results of the platform have been combined with objective observations by scientists. Therefore, human errors are not excluded despite applied 4-eyes principle.

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