

The Digital Transformation of Local Owner-Operated Retail Outlets

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To Sarah

and our shared passion for shopping

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List of Abbreviations

Abbreviation	Description
APA	American Psychological Association
CCEC	Competence Center E-Commerce
CIMA	CIMA Beratung + Management GmbH
ECC	ECC Köln
EHI	EHI Retail Institut
EU	European Union
FMCG	Fast Moving Consumer Goods
HDE	Handelsverband Deutschland e.V.
HNA	Hyperlink Network Analysis
IFH	Institut für Handelsforschung
IHK	Chamber of Commerce and Industry
IoT	Internet of Things
IS	Information Systems
LOORO	Local Owner Operated Retail Outlets
LSP	Local Shopping Platform
ME	Micro Enterprises
NRW	North-Rhine Westphalia
PLS-SEM	Partial Least Squares Structural Equation Modeling
ROPO Effect	Research Online – Purchase Offline Effect
RQ	Research Question
SEO	Search Engine Optimization
SERVQUAL	Service Quality Approach
SME	Small-Medium Enterprises
SNA	Social Network Analysis
S-O-R Model	Stimulus – Organism – Response Model
TOE-Framework	Technology – Organization – Environment Framework
VSW	Verein der Soester Wirtschaft
WMS	Wirtschaft und Marketing Soest GmbH

“Everyone takes the limits of his own vision for the limits of the world.”

Arthur Schopenhauer

1. Introduction

1.1 Transformation of the Local Retail Sector

A disruptive change and transformation process in the retail industry threatens the very existence of Local Owner Operated Retail Outlets (LOOROs) (HDE, 2016, p. 9; IFH, 2015; Heinemann, 2014). Accordingly, the traditional business model of LOOROs is challenged by digitalization pressure imposed by online and offline competitors (Liebmann, 2013; Holden, 2017) as well as by changing shopping habits of their customers (IFH, 2016, p. 33; Statista, 2017). However, to understand the present state of development of the suspended business type LOORO, it is necessary to look back in history: The retail sector is one of the oldest industries in the history of mankind. Archaeological evidence for trade dates back more than 10.000 years to antiquity (Shaw and Jones, 2005, pp. 241-242; Bintliff, 2002, pp. 209-217). Retail's core activity, the exchange of goods between people and organizations is named the driving force for development, prosperity and wealth in today's societies (Niemeier et al., 2012, pp. 10-12; Shaw and Jones, 2005, pp. 241-242). But, despite the rapid development of the retail outlets from simple booths in ancient history to sophisticated and complex shopping malls today, the basic trade process (including the necessary face-to-face interaction) remained untouched for centuries (Coleman, 2006, pp. 19-49, Niemeier, 2012, pp. 10-12).

Only recently, with the advent and the spread of internet-ready devices (stationary and mobile) in private households and organizations in the end of the 20th century, the disruptive transformation process of the retail sector has started to change the trade process fundamentally (Feinleib, 2017, p. 69). Accordingly, the so called “digitalization” has extended a competitive environment for the former locally orientated retailers like LOOROs on a broad scale. On the one hand, the digitalization has introduced new pure e-commerce players to the retail industry, which do not possess physical shops and showrooms (Wolny and Charoensuksai, 2014, p. 317). Furthermore, these pure online players offer a wide range of products and merchandise to low prices via online shops throughout the internet (Feinleib, 2017, pp. 20-22). Unattached to limited catchment areas, shelf spaces and regulated opening hours, these e-commerce players have started to challenge the local retailers traditional business models in their very core (IFH, 2015; Heinemann, 2014). On the other

hand, the new digital competition for local retailers is not only imposed by the internet. Already today, formerly pure online players begin to conquer the cities with digital empowered physical stores (Liebmann, 2013; Holden, 2017). And Big-box retail outlets as well as traditional chain stores are digitalizing their stationary business models and offer multichannel sales and services to their local customers' on-site (HDE, 2017, pp. 1-14).

Simultaneously, the available digital information and communication channels and the according devices also enable the local customers to fundamentally change their shopping habits as well as their shopping expectations (IFH, 2016, p. 38). Subsequently, local stationary retailers have to face new shopping behaviors by their customers, i.e., "Showrooming" and its counterpart "Webrooming". Showrooming describes the customer behavior of viewing and evaluating a physical product in-store, but then buying it online. The term Webrooming is used when customers research and evaluate a product online, but then go and buy it in-store (Wolny and Charoensuksai, 2014, p. 318). Accordingly, shopping has become a complex journey in which customers choose the route they take (e.g., which device or sales channel) and which, arguably, needs to be understood by retailers. In the past, research has developed many approaches to map the touchpoints of customers to the retail organization, like service blue printing (e.g., Granbois, 1968; Naumann and Jackson, 1999; Bijmolt et al., 2010) or the many different kinds of the "Customer Decision Journey" (Court et al., 2009). However, today's multichannel customers research online and offline, switch devices and collect purchase related information wherever possible (see example in Figure 1.1) (Schramm-Klein et al., 2011, p. 8; Wagner, 2015, p. 130).

Channel / Touchpoint			Stages of the Customer Journey				
Channel	Device	Touch point	Pre-Purchase			Purchase	Post-Purchase
			Awareness	Information	Evaluation		
Mobile	Smart-phone	Mobile App	○	②	○	○	⑤
		Mobile Website	①	○	○	○	○
	Tablet	Web App	○	○	○	○	○
		Responsive Website	○	○	○	○	○
Fixed	Laptop / PC	Website	○	○	○	○	○
Store	-	Sales Area	○	○	③	④	⑥

Figure 1.1 Cross-Channel / Cross-Device Customer Journey (Example based on Wagner, 2015)

The triade of digital advanced online and offline competition on the one side as well as changing shopping habits and expectations on the other puts pressure on all local stationary retailers to adapt to the new digital state of the art. However, studies show that not all kinds of retailers are adapting to the new situation in the same pace (IFH, 2016, p. 38; HDE, 2017, p. 9). Especially the small and owner operated retail businesses suffer most under the digital transformation of the local retail sector and seem to be suspended (Simón-Moya et al., 2016, pp. 159-162). Accordingly, the market share of the LOORO business type in Germany has already declined from 26% in 2003 to 17.9% in 2015 (HDE, 2017, p. 9). Furthermore, several independent studies predict a decline in revenues of 30% for LOOROs in Germany over the next four years (IFH, 2015; Heinemann, 2014) and about 50% in the next ten years (Siemssen, 2017).

However, the above described development has not only negative implications on the future prospects and the survival of LOOROs. For European countries like Germany, local owner operated retail outlets are an unreplaceable part of city centers, which are the heart and soul of the local communities. Subsequently, the steady dying of LOOROs has also negative implications on the local labor markets (where LOOROs are still employing huge numbers), the attractiveness of the city centers and finally on the future prospects of the associated professions like cafes, restaurants and many more (IFH, 2016, p. 3). In the end, the German cities have more to lose than just an old-fashioned business type, they are threatened to lose a core part of their economic power and their traditional cultural identity (HDE, 2017, pp. 3-14).

Surprisingly, the traditionally strong research activities on trade and commerce in Germany have neglected research on small and medium sized owner operated retailers and their faced challenges towards the digitalization. Instead, well-known research institutions and universities (e.g., IFH, ECC, HDE, EHI, CIMA) concentrated their research activities on retail market research, research on large retail corporations (e.g., the digitalization of retail chains and/or big box retail outlets) and customer research in the past. This dissertation fills in this research gap and aims to reduce the amount of considerable backlog on research on the digitalization of small retailers by conducting extensive research on the current state of digitalization of LOOROs. Therefore, it is aimed to derive and to identify possible options for actions to foster the adoption of digital tools and applications by LOOROs as well as to point out further measures for LOOROs to regain competitive power and to survive in the digital future.

1.2 Definition of Local Owner Operated Retail Outlets

The main research subject and target group of this dissertation are Local Owner Operated Retail Outlets (LOOROs). As LOOROs are individual businesses which are following individual business models, the aimed field of research was characterized by its high diversity in terms of types and kinds of retailers and their individual and different product and merchandise offers (HDE, 2017, p. 9). Despite the necessary owner involvement, there was no clear definition for LOOROs to build on. Accordingly, a simple framework to define LOOROs has been developed. It was derived from existing market research (e.g., HDE, 2015) and published studies (e.g., IFH, 2015) and used as contrast to larger retail organizations like chain stores, with obviously different background, possibilities and market situations.

Accordingly, a retail store is considered as LOORO if it fulfills the following criteria:

- 1) It is a local store with existing physical sales area.
- 2) The owner is involved into the day-to-day operations of the store.
- 3) The store is independent (not part of a retail chain or a franchise / not more than three subsidiaries).
- 4) The store is selling consumer goods (e.g., Fast Moving Consumer Goods (FMCG)).
- 5) The store follows standard opening hours (open at least 8 hours per day, at least five days per week).

1.3 Content and Structure

1.3.1 Research Questions & Methodology

In front of the introduced background, this dissertation aims to deliver a deeper understanding about the current readiness of Local Owner Operated Retail Outlets (LOOROs) for the challenges of the digitalization. Building on the gained insights about the current state of digitalization of LOOROs and the challenges they face in their day-to-day operations, it is aimed to derive possible options for action for LOOROs to regain competitive power and to help them to survive the ongoing disruptive innovation and transformation process of the retail sector. Accordingly, this dissertation aims to give answers to the following overall research questions:

RQ1: *What is the current state of digitalization of local owner operated retail outlets?*

RQ2: *What are possible options for actions for local owner operated retail outlets to regain competitive power and to survive in the digital future?*

To approach these overall research questions, this dissertation contains eight individual studies and is structured in the following three sections: 1) Pilot Study, 2) Main Study and 3) Specialization Area (see Figure 1.2).

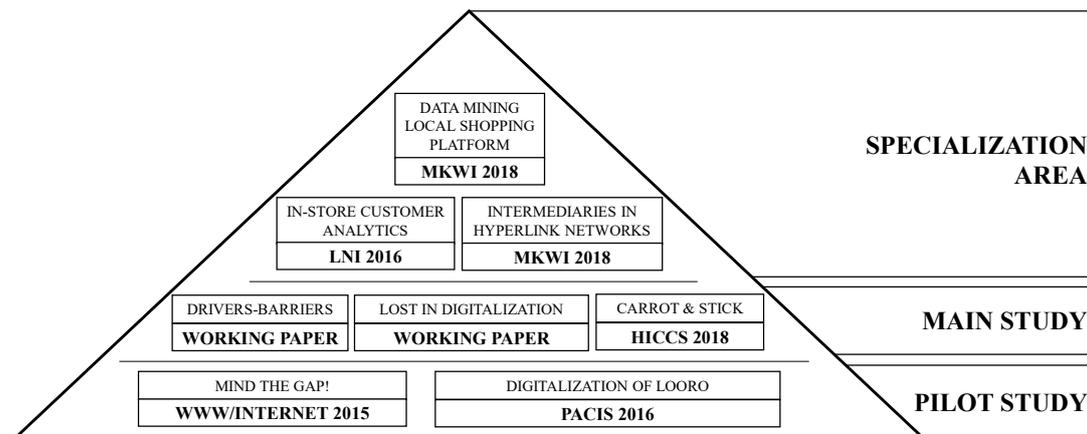


Figure 1.2 Publication overview

While two studies are descriptive and are based on a literature analysis (chapter 2 and chapter 7), all other studies, however, are using methods of empirical research (Structural Equation Modeling (PLS-SEM), Hyperlink Network Analysis, Web Usage Mining, Association Rule Mining) to contribute to answer the overall research questions (see overview Table 1.1).

Chapter	Name	Methodology	Sample
2.	Mind the Gap! Are Local Retailers misinterpreting customer expectations regarding digital services?	Literature Analysis, Focal Action-Set Approach	-
3.	Digitalization of Local Owner Operated Retail Outlets: The Role of the Perception of Competition and Customer Expectations	Structural Equation Modeling (PLS-SEM)	Owner of LOOROs (N=52)
4.	Lost in Digitalization: Why Local Owner Operated Retail Outlets Hesitate to Digitalize their Businesses	Structural Equation Modeling (PLS-SEM)	Owner of LOOROs (N=223)
5.	Drivers and Barriers of the Digitalization of Local Owner Operated Retail Outlets: A Case of Retailers in Rural Areas of Germany	Structural Equation Modeling (PLS-SEM)	Owner of LOOROs (N=223)
6.	Carrot-or-Stick: How to Trigger the Digitalization of Local Owner Operated Retail Outlets?	Structural Equation Modeling (PLS-SEM)	Owner of LOOROs (N=223)
7.	In-Store Customer Analytics – Metrics and Maturity Scenarios for the Collection of Physical In-Store Customer Data	Structured Literature Analysis	-
8.	The Role of E-Intermediaries in Local Retail Hyperlink Networks: A Hyperlink Network Analysis	Hyperlink Network Analysis	Local Websites (N=14,780)
9.	Are Local Retailers Conquering the Long Tail? A Web Usage and Association Rule Mining Approach on Local Shopping Platforms	Web Usage Mining, Association Rule Mining	Page Views (N=487,906)

Table 1.1 Overview methodology and sample

1.3.2 Research Area

The research presented in this dissertation is embedded into the research project “Future Lab Retail South Westphalia 2020”. The “Future Lab Retail” is an EU-funded research project (EFRE 2014-2020 | 34.1.15-EFRE-0200331 (AO 971621005)) based in the rural region of South Westphalia, Germany. It was launched on April 1st, 2016. The official end of the project is scheduled for March 2019. The stated research goal of the “Future Lab Retail” is to strengthen the competencies of the resident retailers in the region of South Westphalia (in particular local owner operated retail outlets) in the multi-channel area. Accordingly, all studies and samples are related to the region of South Westphalia.

South Westphalia itself is a region in North Rhine-Westphalia (NRW), Germany. It comprises the subregions Sauerland, Siegerland and Soester Börde. The mostly rural region of South Westphalia is the most sparsely populated region of the federal state NRW (Südwestfalen Agentur, 2017).

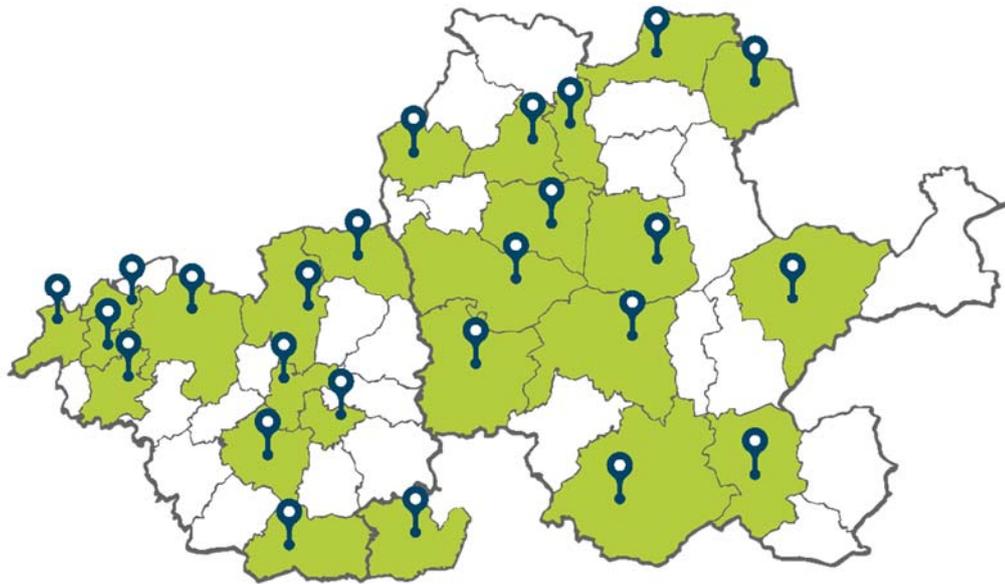


Figure 1.3 Map of South Westphalia with participating districts in the analysis phase

The “Future Lab Retail South Westphalia 2020” is a cooperative research project among the Chambers of Commerce and Industry (IHK) of Arnsberg and Hagen, the South Westphalia University of Applied Sciences, the University of Siegen and the Research Institute for Regional and Knowledge Management gGmbH in Iserlohn. The project is supported by the following South Westphalian cities: Altena, Arnsberg-Neheim, Attendorn, Bad Sassendorf, Brilon, Geseke, Gevelsberg, Hagen, Iserlohn, Lippstadt, Lüdenscheid, Marsberg, Meinerzhagen, Menden, Meschede, Möhnensee, Rüthen, Schmallenberg, Schwelm, Soest, Sprockhövel, Sundern, Warstein, Werdohl, Werl, Wetter and Winterberg.

More information about the Future Lab Retail South Westphalia 2020 is provided on the project website: www.einzelhandelslabor.de.

1.3.3 Section I: Introduction & Pilot Study

The first section of this dissertation is based on two preliminary papers building on a first pilot study to examine the current state of digitalization of LOOROs. The pilot study was conducted in February 2015 and surveyed 52 owners of LOOROs from the City of Soest, South Westphalia, Germany. The survey was supported by a group of local retailers, the city owned marketing agency (Wirtschaft & Marketing Soest GmbH, WMS), the association of the local retailers (Verein der Soester Wirtschaft, VSW) and the City of Soest itself. The

WMS provided the addresses of 135 retail outlets, of which 85 corresponded to the parameters for local owner operated retail outlets (see chapter 1.2). From the 85 personally invited LOOROs, 44 participated in the survey in paper form and 8 via an online form. Accordingly, 52 full datasets have been included into the pilot study.

The first paper of the first section: “*Mind the Gap! Are Local Retailers Misinterpreting Customer Expectations Regarding Digital Services?*” offers a literature-based introduction concerning the challenges and opportunities of the digitalization for local owner operated retail outlets. With the help of the “Focal Action-Set Approach” of Conway and Steward (1998), which guides researchers through the process of selection (abstraction) of specific aspects of the total (social) network surrounding the field of interest, this first study identifies the important actors of the digital transformation in the local retail sector and highlights key issues and possible research directions. Finally the study concludes with an overview about the digitalization opportunities for LOOROs, structured among the customer’s journey (Court et al., 2009). This introductory paper aims to be a first contribution to launch the research on the overall topic, structure the field and leading the way for all following empirical papers of the pilot and main study.

The second paper: “*Digitalization of Local Owner Operated Retail Outlets: The Role of the Perception of Competition and Customer Expectations*” is the first empirical study of this dissertation. It is emphasizing the importance of the perception of the activities of the competitors and the interpretation of the customer expectations for the digitalization efforts of LOOROs. The analysis was built on the Technology-Organization-Environment Framework (TOE) and was carried out with the help of partial least squares structural equation modeling (PLS-SEM) (Hair et al., 2014, p. 14). The paper concludes with the finding, that LOOROs seem to lose track of their customers’ needs and wants. It suggests that owner and manager need to take countermeasures and start with a step by step digitalization of their business processes to catch up with the digital development.

1.3.4 Section II: Main Study

Section two builds on three papers derived from the main study. The study was conducted from May to June 2016 and is advancement with regards to the sample size and the used research framework compared to the pilot study.

The improvements in detail: 1) the main study is built on a larger sample to improve the explanatory power of the conducted research. The new study contains data from retailers of

26 cities from the region of South Westphalia, Germany. The survey contained 240 questions and was supported by the Chambers of Commerce and Industry (IHK) of Arnsberg and Hagen as well as by representatives of each of the 26 participating cities. The local representatives delivered in total 620 already preselected addresses of retailers matching the criteria (see chapter 1.2). 489 of these retailers could be reached and had been personally invited to take part in the survey. Finally 243 retailers have participated in the survey. From the entries, 223 contained full datasets and which subsequently had been used for the analysis of three papers covering the main study. 2) The main study is built on an improved research framework. The new framework is focusing on an owner-centric examination on the individual-level. In larger companies, decisions are subject to collective, collaborating scrutiny and testing, and are influenced by internal groups to a much higher degree than in micro-enterprises like LOOROs. In LOOROs, the owner is the executive manager, salesman, and storekeeper in personal union (Venkatesh, 2006, pp. 497-500). Hence, the owner-managers of LOOROs are the company's key decision-makers and they are more influenced by external factors than by (not existing) internal structures (Lieberman-Yaconi et al., 2010, p. 80). Accordingly, an improved Stimulus-Organism-Response Model (S-O-R Model) as research framework on the individual-level is introduced.

While each of the main study papers is using the same data source, each paper is analyzing different parts of the collected data and is using individual theoretical backgrounds and viewpoints. However, all papers use, like the second paper of the pilot study, partial least squares structural equation modeling (PLS-SEM) as analysis technique. Accordingly, the three papers are strongly related to each other and have theoretically (S-O-R Model) and analytically (PLS-SEM) intersections. Thus, each of the papers can be seen as individual evolutionary step to scrutinize the digital development of LOOROs from different stands.

The first study: *“Lost in Digitalization: Why Local Owner Operated Retail Outlets Hesitate to Digitalize their Businesses”* examines the low digital development-level of LOOROs and scrutinizes why, despite the manifold digital options to regain competitive power, LOOROs are hesitating and struggling in their digital transformation. The paper concludes with the finding that LOOROs are facing a shortage of available infrastructure and human resources, and, even more important, that they face a situation of uncertainty. It seems that LOOROs hold and wait with their decision towards digitalization, as they do not know whether their own available infrastructure is sufficient or not for the digitalization and if necessary, in which technologies they should invest.

The second study: *“Drivers and Barriers of the Digitalization of Local Owner Operated Retail Outlets: A Case of Retailers in Rural Areas of Germany”* analyzes the survey data of the main study for possible drivers and barriers of the digitalization of LOOROs. The aim of this study is to identify possible trigger points that can help to promote LOOROs digital development. The paper concludes with the finding that despite manifold barriers, the digitalization of back-end activities can be a suitable starting point and trigger for all subsequent business areas of LOOROs. The use of tools and applications for digital marketing also offers promising perspectives towards digital development. However, it seems unlikely that suspended business types like LOOROs can independently overcome their manifold barriers to recover. LOOROs will depend on external support to adapt to the digital development of their competitors as well as their customers.

The third study of the second section: *“Carrot-or-Stick: How to Trigger the Digitalization of Local Owner Operated Retail Outlets?”* scrutinizes possible triggers for the public sector (politicians, city managers and retail lobbies) to push the digitalization efforts of local retailers from the outside. The findings of the study show that LOOROs are receptive for the “Carrot-and-Stick Approach” (Carrot = Subsidies, Stick = Regulations). LOOROs suffer from a shortage of resources and perceive pressure from their environment. With low resources and a high perception of pressure the prospects of success of a “Carrot-and-Stick Approach” are promising (Salamon and Elliot, 2002, pp. 1-47). Both subsidies (adding resources) and regulations (creating pressure) will have an impact on LOOROs digitalization efforts.

1.3.5 Section III: Specialization Area

The contributions of the last section are build on the findings of the main study. The following three studies aim to discuss and deepen possible options for actions of LOOROs with regards to the digitalization of the physical sales areas and in-store analytics, the improvement of LOOROs web presences and the use of local shopping platforms as digital sales and communication channel.

The first contribution: *“In-Store Customer Analytics – Metrics and Maturity Scenarios for the Collection of Physical In-Store Customer Data”* is based on a structured literature review (Webster and Watson, 2002, pp. 3-11) and offers insights about the analytical performance of possible digital applications for the physical sales areas. This study is focusing on in-store analytics and customer tracking. Based on the results of the derived maturity assessment

matrix, the study points out that a hybrid solution (e.g., connection of optical sensors and smartphone) can overcome the data gaps of normal proxy technologies (e.g., only smartphone). At the same time, hybrid solutions also offer opportunities for the development of customized and personalized services to target specific clients and still respect their privacy. Accordingly, In-store customer analytics based on hybrid solutions can be a basis for the reorganizing of pricing, products and the marketing setup in physical stores and offer therefore a wide range of possible development options for LOOROs.

The second study of the last section: *“The Role of E-Intermediaries in Local Retail Hyperlink Networks: A Hyperlink Network Analysis”* analyzes the current state of online presences of LOOROs and their link behavior towards e-intermediaries with the help of Hyperlink Network Analysis (HNA). HNA is a subset of Social Network Analysis (SNA). SNA is the process of investigating social structures by applying networks and graph theory (i.e., Richards and Barnett, 1993). The difference between hyperlink and social network analysis is that HNA does not analyze social relationships. HNA relies on the use of hyperlink data that can be obtained only from websites. However, little is known about LOOROs online networking patterns, link-building strategies and the specific role of e-intermediaries in this matter. The results of this study show that there are no direct hyperlink networks between local retailers. Nevertheless, local hyperlink networks between local retailers and other retail stakeholders are present. With regards to the role of e-intermediaries, the results show that e-intermediaries play a central role in the analyzed local retail hyperlink networks. E-intermediaries have relationships with LOOROs and with most of the other stakeholders, too. Furthermore the results show that e-intermediaries act as link hubs and mainly target local retailers. However, the brokerage power of the e-intermediaries within the networks and between the stakeholders is limited. LOOROs hesitate to link to e-intermediaries and therefore thwart their brokerage role.

The last study of this dissertation: *“Are Local Retailers Conquering the Long Tail? A Web Usage and Association Rule Mining Approach on Local Shopping Platforms”* analyzes the web usage data of a local shopping platform (LSP) and gives insights into the expected performance for LOOROs as product providers on these platforms. Web usage mining is the application of statistics and data mining techniques to discover usage patterns from web usage data like web logs and web tracking reports (Nagi et al., 2011, pp. 167-168). The goal of Web Usage Mining is to capture, model, and analyze the behavioral patterns and profiles of users interacting with a website (Kumar and Rukmani, 2010, p. 400). The results show that due to the limited catchment area of LOOROs, the local shopping platform attract

visitors and potential customers from outside the local and the distant catchment area and thus help LOOROs to extend their market reach. Surprisingly, the LSP at this point does not attract their visitors to browse around on their platform, to look at various offers of the local vendors, and to discover unknown niche products. LSPs not seem to work as full functional e-marketplace. Additionally to this main insight, the web usage data revealed demand patterns, indicating Long Tail opportunities for the expansion of the catchment area and opening hours for LOOROs, and is also pointing at demand for digital shelf extensions in the local shops.

In summary, the collection of the presented eight individual studies is shedding light on different questions and challenges concerning the reluctant digitalization of LOOROs and offers insights on how to trigger this process. However, the eight studies are also documenting the development of the growing maturity level of the research process itself. The studies show the journey from the literature based introduction of the topic in chapter 2, over the first empirical analysis in the pilot study in chapter 3, to the extended and improved analysis of the main study in chapter, 4, 5 and 6. And finally the deep dive into special and more applied topics in chapter 7, 8 and 9.

1.3.6 Adjustments and Modifications

In order to improve the readability of this dissertation the following adjustments and modifications of the publications have been elaborated:

- 1) A continuous numbering of the sections, tables and figures were implemented.
- 2) The inline references to the sections, tables and figures were updated.
- 3) The overall reference style had been harmonized to the APA style (American Psychological Association, <http://www.apastyle.org/>).
- 4) The overall language has been harmonized to American English.
- 5) The page numbers were added to the references.
- 6) The ordering, the language and the expression of the publication “*Mind the Gap! Are Local Retailers Misinterpreting Customer Expectations Regarding Digital Services?*” were slightly improved and updated.
- 7) The publication: “*In-Store Customer Analytics – Metrics and Maturity Scenarios for the Collection of Physical In-Store Customer Data*” were translated from German to English language.
- 8) If necessary, figures were updated to improve their display quality.

However, the content of the studies remained unchanged.

Section I

Introduction & Pilot Study

2. Mind the Gap! Are Local Retailers Misinterpreting Customer Expectations Regarding Digital Services?

2.1 Publication Details

Abstract: Local owner operated retail outlets (LOORO) are in a phase of intense transformation. Digitalization and e-commerce are questioning the traditional retail business models. A survey conducted in a mid-sized German city points out that local retailers are aware of the importance of digitalization for their businesses in future, but nonetheless do not think that their customers actually expect sophisticated digital services by them. In contrast to these findings, another recent study for the same city just revealed that 45% of all asked customers have already changed their buying behavior towards online retail. Shopping-convenience (e.g., time saving) is a known key factor for the buying decision and for the channel choice of customers, but local retailers do not seem to be fully aware about the opportunities of digital shopping convenience for their own business. If so, they run the risk of losing sight of the continuously developing digitalization-based business model innovations and the accordingly changing customer expectations, which would inevitably weaken their competitive position. In this context, this paper uses the SERVQUAL Gap-Model by Parasuraman et al. (1985) to classify and interpret these observations and offers examples of digital capabilities for LOORO to facilitate the Customer Journey.

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2.2 Introduction

In a low growth market environment, the local owner operated retail outlets (LOORO) represented the group with the highest revenue losses in 2014 (HDE, 2015, pp. 3-14). The continued digitalization and further development towards chain stores threatens the very existence of local retail outlets run by their owners. In contrast to this, online retail has been expanding at a growth rate of 17.8 % in 2014 (HDE, 2015, p. 9). According to the German Retail Federation (Handelsverband Deutschland e.V., HDE), online retail will continue to have good growth prospects in the future, especially due to its pioneering digitalization work. But so far, retail is still dominated by in-store sales. However, despite the huge growth rates, the turnover share of e-commerce of retail is still only 11.1% in Germany (Statista, 2014, p. 13). The biggest changes in store-based retail in the last 20 years have been a tendency towards market concentration as chain stores and specialist retailers winning more and more market share from LOOROs. The share of LOOROs among German retail businesses is down from 30% in 1995 to now at only 14% (Ben-Shabat et al., 2015, p. 3).

This development leads us to the question whether the digitalization, which is the key ingredient of online retail and at the same time an important aspect of chain stores, specialist stores and big retail companies, can also open a new development perspective for LOOROs? However, as most of the research into digitalization in retail has concentrated on strategies for implementing digital applications in big organizations, there is a major gap in research into digitalization of small owner-run businesses. In order to address this gap, the authors of this paper have conducted a survey on the current state of digitalization of LOORO in a medium-sized town in Germany. In addition to providing information about the state of digitalization of LOORO, the survey's findings indicate a misalignment or mismatch between the perceived importance of digital services in the future on the one side, and the current implementations and availability of digital services – or even the willingness of LOORO to engage in digitalization – on the other side. This paper aims to be a first contribution to the overall topic. It will discuss and analyze the introduced mismatch on a rather descriptive level and offer the ground work for following empirical studies. Finally, the paper presents the hypothesis that owner-run business are in danger of being alienated from the expectations of their customers and that they seem to underestimate the relevance of service convenience for customers who have already changed their buying behavior in the context of digitalization.

The remainder of this paper is organized as follows: In the third section, we define the field of research and derive a Focal Action-Set (Conway and Steward, 1998, p. 12) based on the

Technology-Organization-Environment framework (i.e., Tornatzki and Fleischer, 1990) to identify the main actors of the digital transformation of the retail sector. In the fourth section, we focus on customers as key actors and describe the relevance of convenience for their buying and channel decisions. In the fifth section, we introduce the SERVQUAL approach and the Gap-Model as frameworks for the discussion of the descriptive survey findings provided in the following sixth section. Next to these results of our own survey on retailer expectations regarding digitalization and digital services, the sixth section also contributes findings of a separate study about the change in the customers buying behavior. In the last section, we summarize our findings, provide new research questions and outline exemplary options for LOOROs to digitally support the customer journey.

2.3 Mapping the Local Commerce Innovation Network

In the age of digitalization, the retail sector is experiencing major changes. Established structures are eroded, business models are questioned, information asymmetries shift, and power structures among competitors and also between retailers and customers change. Furthermore, limitations of time and space are put into question, and new entrants from other industries introduce innovative ideas and new solutions to customers. The many technology and non-technology-driven changes triggered intense retail business research in general, but the digitalization of LOORO has captured only little attention so far. LOORO are no part of any large retail association or chain store and are very hard to classify as they encompass different owner personalities, different business sectors, different target groups and different business strategies.

To overcome the obstacles of the heterogeneity of LOORO, we start this line of research with designing a conceptual framework to map this special field of interest. To do so, we used the Focal Action-Set approach of Conway and Steward (1998), which guides researchers through the process of selection (abstraction) of specific aspects of the total (social) network surrounding the field of interest. It focuses the attention on the actors of innovation (in this case also transformation) and their relationships to each other. Following the approach of Conway and Steward, two decisions are necessary: The first decision is about the rules of inclusion (which actors to include in the framework) to find a definitional focus. To make this decision, we searched for a well-established theoretical model with regard to the adaption of technologies in comparable (small) companies. Ramdani and

Kawalek (2007) developed the following well-structured overview of the most used models in the context of adaption of technologies and innovation in SMEs:

- Technology – Organization – Environment Framework (TOE-Framework)
- Technology Acceptance Model (TAM)
- Theory of Planned Behavior (TPB)
- Combined TAM and TPB
- TAM2
- Diffusion of Innovations Theory
- Resource-Based View
- Stage Theory
- Unified Theory of Acceptance and Use of Technology (UTAUT)

Ramdani and Kawalek (2007) summarized that the listed models typically examine the categories of technology, organization and environment, which also represent the basis categories of the also named TOE-Framework. Hence, for our definitional focus, we chose the Technology-Organization-Environment Framework (TOE-Framework) of Tornatzki and Fleischer (1990) as the theoretical foundation for our coming Focal Action-Set.

The second decision concerned the manner in which the abstraction of the definitional focus is anchored or centered, termed nodal-anchoring. The nodal-anchoring of our network is centered on the technological and innovational decision making by LOORO, which is termed an ego-centered anchoring (Conway and Steward, 1998, p. 7). The graphical output of these thoughts is termed “Actor Positioning Template” and is depicted in Figure 2.1:

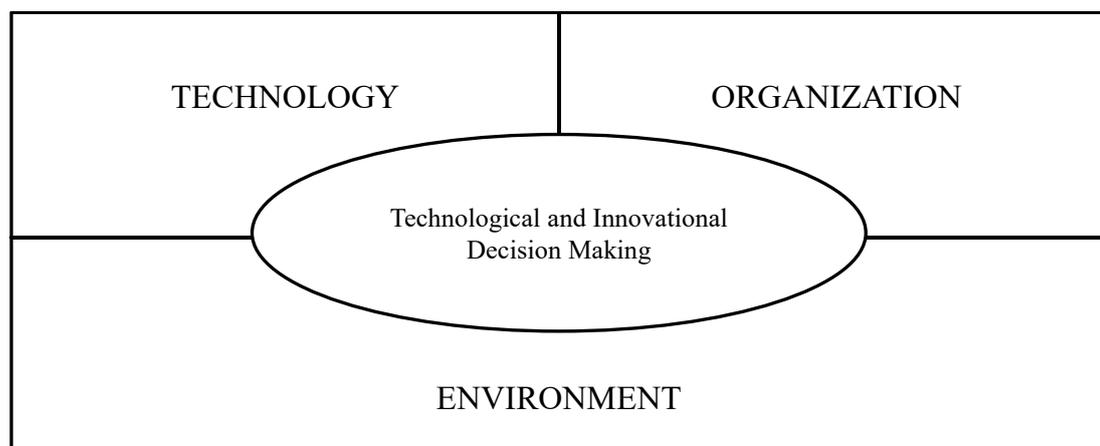


Figure 2.1 TOE-framework based Actor-Positioning Template (based on Conway and Steward, 1998, p. 12)

The last step in designing the local commerce Focal Action-Set is to place the actors (i.e., transformation drivers) on the Actor-Positioning Template. Therefore, we translated the indicators of the TOE-Framework of Tornatzki and Fleischer (1990) into categories of LOORO transformation drivers: Technology, Owner, Competition, Customers, Suppliers, Urban Infrastructures and Politics. All were placed around the focal actor, the decision-making LOORO (Figure 2.2). With the help of the Focal Action-Set, it is now possible for further research to focus on specific fields of interest in this wide range of actors / drivers.

The last step in mapping an innovation network based on the work of Conway and Steward (1998) is to describe the relationships between the drivers and the focal actor. In this paper, we will focus on the relationship between LOOROs and their customers. We want to get a better understanding of how customer decision-making works and what opportunities evolve in this process. Therefore, we will show in the following that today's customers have changed their shopping behavior and that shopping-convenience is a key factor for shoppers to make their buying decisions and their choice of channel. Accordingly, we will examine the hypothesis that the use of digital services to increase shopping-convenience could be promising for LOOROs, and, regarding to the TOE-Framework and the identified transformation drivers, that the change in shopping behavior should influence the state of digitalization of LOOROs.

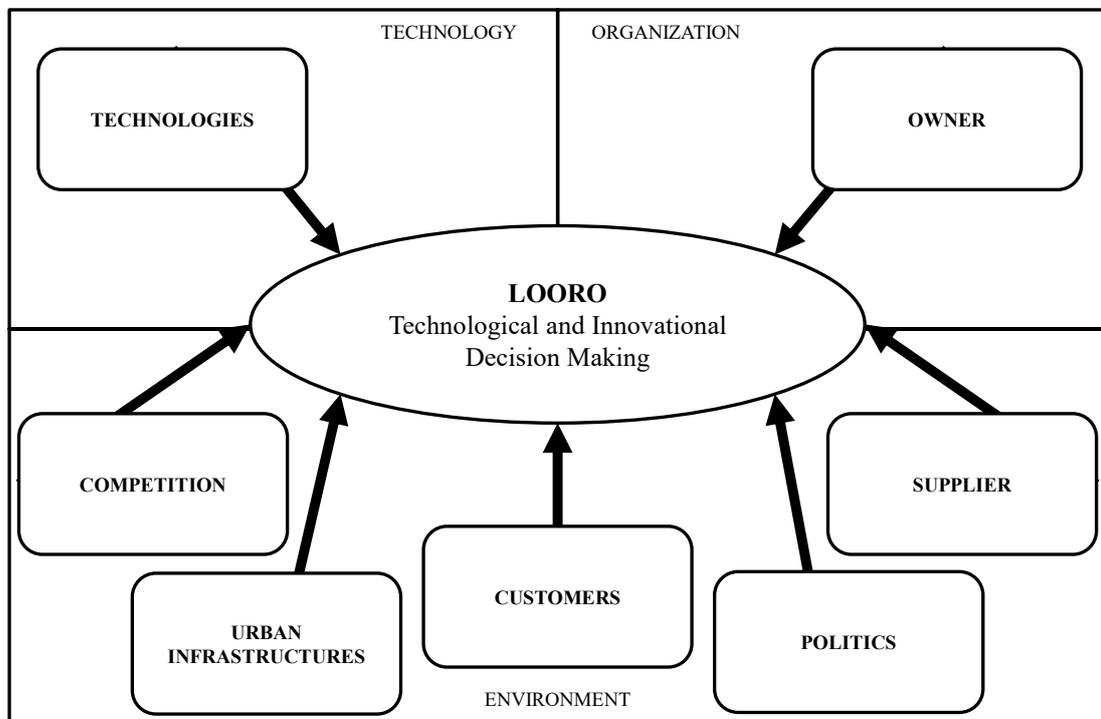


Figure 2.2 Local Commerce Focal Action-Set (Conway and Steward, 1998, p. 12)

2.4 Convenience as Key Factor Influencing Buying and Retail Channel

Decisions

According to Seiders et al. (2007), shopping convenience reflects consumers' perceived time and effort in purchasing or using a service. A number of studies have shown that shopping convenience (e.g., time-saving) has a major influence on buying decisions (e.g., Wolfenbarger, 2001; Berry et al., 2002; Gupta, 2004; Bednarz et al., 2010; Jiang et al., 2013) and retail channel decisions of customers (e.g., Rohm and Swaminathan, 2004; Chang, 2005; Choudhury, 2008; Maity and Dass, 2014). If the products are very similar or even the same, the customer weighs pros and cons (convenience / risk) of different retail channels and then takes his buying decision and channel choice, which is thereby influenced by his personal background (e.g., education level and experience) (Bhatnagar, 2000, p. 3).

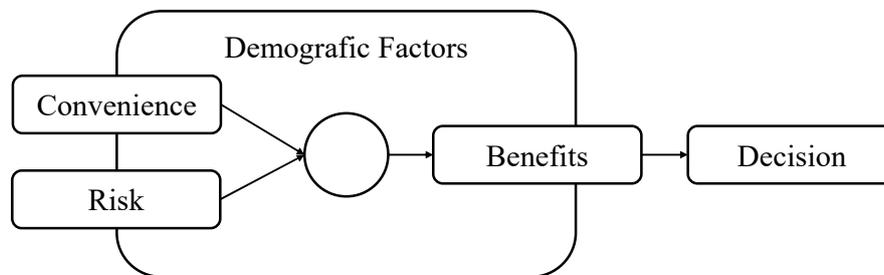


Figure 2.3 Convenience, risk and internet shopping behavior (Bhatnagar, 2000, p. 3)

In the context of retailing, Seiders et al. (2000) suggest four dimensions of convenience, which will guide the further discussion in the following sections:

- (1) Access: Consumers may reach a retailer.
- (2) Search: Consumers can identify and select products they wish to buy.
- (3) Possession: Consumers can obtain desired products.
- (4) Transaction: Consumers can effect or amend transactions.

We adapted this classification of shopping convenience for our survey and developed it into a set of digital shopping convenience categories as follows:

1. Online Visibility (Access): This category comprises all questions that refer to visibility online, like through a website (e.g., addressing also search engine optimization (SEO) activities), through search engines, or on digital markets.

2. Digital In-Store Applications (Search): This category refers to all questions related to the product management, like the digitalization of stock management, etc.
3. Delivery and Pick up (Possession): This category deals with delivery services and pick-up options for sold products.
4. Payment and Customer Relationship Management (Transaction): This category refers to questions that focus on e.g., payment methods or customer loyalty efforts, such as customer databases and loyalty schemes.

In the following presentation and discussion of survey results, the mismatch between expectations of the relevance of digitalization and the visible implementation efforts is revealed. Thereby, only a small set of questions / results which is in particular related to the above mentioned categories of digital shopping convenience, will be considered.

2.5 Local Commerce and the SERVQUAL Gap-Model

Service quality research has spawned a number of approaches and models (e.g., Cardozo, 1965; Powers, 1988) during its long tradition, such as the SERVQUAL model by Parasuraman et al. (1985). SERVQUAL offers a framework for measuring and managing service quality that encompasses both customer expectations as well as the actual service experience and also defines specific types of gaps that can cause a mismatch between expected and experienced service quality. SERVQUAL allows to conduct research into causes of over- or under-fulfilment of customer expectations using the confirmation / disconfirmation-paradigm amongst other tools. Figure 2.4 shows the SERVQUAL Gap-Model with the several defined types of gaps (Parasuraman et al., 1985, p. 4).

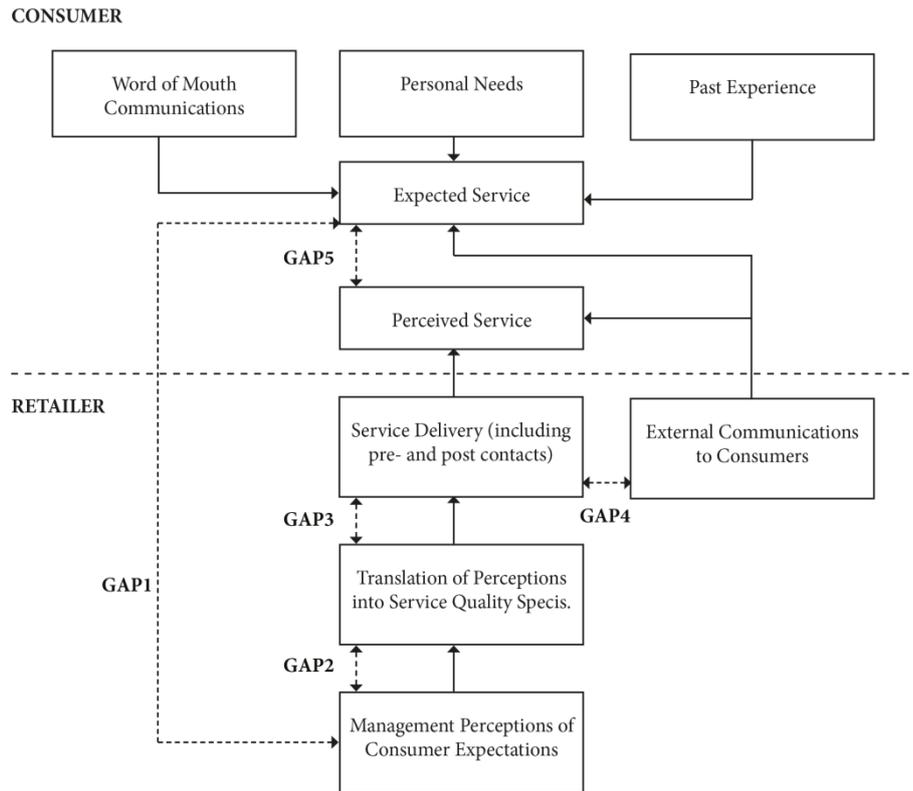


Figure 2.4 Service Quality Model (Parasuraman et al., 1985, p. 4)

We argue that the findings of the two following surveys indicate the existence of Gaps 1 and 2 of the SERVQUAL Gap-Model, increasing the risk of poor service quality in terms of under-fulfilled digital convenience expectations (Gap 5). According to Parasuraman et al. (1985), Gap 5 stands for the "expected service – perceived service gap" and needs to be interpreted as a function of the other gaps: "*The quality that a consumer perceives in a service is a function of the magnitude and direction of the gap between expected service and perceived service.*" (Parasuraman et al., 1985, pp. 5-8) Gap 1 then represents the "consumer expectation – management perception gap". This gap represents the discrepancies between executive perceptions of and the actual consumer expectations, leading to improper service decisions and thus contributing to a Gap 5, which would mean negative impact on the service quality from the consumers' viewpoint. Gap 2 finally stands for the "management perception – service quality specification gap". It represents the difficulties of the management to match or exceed with their service specifications the expectations of the consumers, for example due to a lack of awareness, understanding or willingness, and thus also contributes to Gap 5. We neglect the other gaps at this point as they do not refer directly to the focus of this paper.

The following section now focuses on the two studies that reveal clear evidence for changing customer shopping behavior and that LOORO are aware of the importance of digitalization, but that they nevertheless do not feel pressured to take efforts to provide digital services as they do not seem to be fully aware of the changing digital shopping-convenience of their customers.

2.6 Changing Shopping Behavior & Retailers' Perception

In 2014, the Institute for Trade Research (IFH) conducted a survey among 411 customers concerning their shopping behavior. This survey took place in the City of Soest, Germany, the same town that we addressed in our survey. The IFH's survey indicates clear evidence of the change in the shopping behavior of today's consumers. It pointed out that 26% of the 411 interviewees indicated that they had changed their high street shopping habits due to new digital retail outlets and that they did less high street shopping than before. A further share of 19.7% stated that they now shop online, but that they so far continued to visit the high street as often as before. This means that a total of 45% of customers have changed their shopping habits already due to the digitalization and the offers of the online retail market (IFH, 2014, p. 38). This also means that in their opting for the online retail channel rather than the high street channel these customers indirectly give on the one hand a negative assessment of shopping convenience of local retail outlets and on the other hand a signal that there is a need to enhance the competitiveness of local retail outlets with regard to digital/non-digital convenience.

In order to investigate the state of digitalization of LOORO in this context, we conducted a survey of local commerce between 10th and 19th February 2015 in the same medium sized German town (46.000 inhabitants / City of Soest). The survey was supported by the society for economic and market promotion (Wirtschaft & Marketing Soest GmbH, WMS) of the town. The WMS provided us with contacts to 135 local businesses that are listed as owner-operated retail outlets on their database. 85 of these 135 businesses fulfilled our definition of a LOORO (e.g., retail store open on business days and with focus on consumer goods). The 85 businesses fulfilling our criteria were contacted personally and invited to take part in the survey. 44 of the contacted business completed all questions on the survey on paper (51.8%). The survey was based on the causality model called Technology Acceptance Model (TAM) (Davis, 1985, p. 24) and the TOE-framework (i.e., Tornatzki and Fleischer, 1990), it consisted of 11 categories with 226 questions.

No.	Question	Answer				
		Very high	High	Average	Low	Very Low
1.	In your opinion, what importance will digitalization have for your business in the future?	10.8%	51.4%	21.6%	10.8%	5.4%
2.	Willingness to work with digital applications?	23.7%	31.6%	31.6%	10.5%	2.6%
3.	How much do your customers expect digital service offerings from you (e.g., online store, apps, internet site)?	5.1%	7.7%	23.1%	35.9%	28.2%

Table 2.1 Exemplary survey questions

The answers of the survey on digitalization in local commerce indicate that there is a gulf between the perception of the relevance of digitalization and the implementation of services or the willingness to consider implementing digital services. This can be illustrated by the following exemplary results: 62.2% of the surveyed retailers stated that digitalization would have a high or a very high relevance for their business in the future (Table 2.1 / Question 1). 55.3% described their willingness to engage with digitalization as high or very high (Table 2.1 / Question 2). Thus, most of the surveyed retailers indicated that digitalization is of a high relevance to them and that they are willing to engage with it. On the other hand, 64.1% of the surveyed retailers assumed that customers would only have a low or even very low expectation of digital services for their business. A further 23.1% did not provide an answer on this question (Table 2.1 / Question 3).

2.7 Conclusion

In summary, after defining the field of research and identifying the key actors, we pointed out that despite the more and more difficult market environment most LOORO see digitalization as a topic rather for the future than for today and do not (yet) feel pressured to really engage with it. Using the SERVQUAL Gap-Model and thereby considering two studies conducted in the same German town covering both the retailers' and the customers' perspective, we identified out a growing mismatch between the (digital) shopping-convenience expected by customers and the according offers and activities of the studied retail outlets.

As we argue that the owner-operated retail outlets, which are a major economic factor for high street retail and the town economy can only retain their competitive edge if they manage to tailor their services and products more towards the service expectations of their customers, our advice is to "Mind the Gap." A closer assessment of customer expectations

and a closer alignment of (digital) services with those changing expectations seem to be key ingredients for making progress and halting the increasing market share of e-commerce for local businesses.

2.8 Future Research and Future Development Options for LOOROs

To address the variety of opportunities for LOOROs in order to increase shopping-convenience through digital services, it is necessary for future research to examine the sales and communication channels. It is almost common business to talk about the seamless integration of all available channels as part of an Omnichannel approach. However, that falls too short in our opinion. In contrast to the company-centric view on channels like web, mobile and in-store, we suggest choosing research on a customer-centric view that explains the digital state of the customer at the touchpoints with the company.

Customer can be met in the following digital states:

1. Offline in-store
2. Offline not in-store
3. Online (fixed) in-store
4. Online (fixed) not in-store
5. Online (mobile) in-store
6. Online (mobile) not in-store

Accordingly, customers who are offline and not in-store could be addressed through traditional marketing and advertising channels. Customers who are offline in-store could be digitally enabled through store facilities to reach the online state (fixed or mobile) in-store so that we can focus on the last four customer states of our list. Further, to show direct-use cases, Table 2.2 uses the well-established customer journey (Court et al., 2009) to structure exemplary digital options and opportunities for LOORO:

Customer Journey	The customer is			
	In-Store		Not In-Store	
	Online Fixed	Online Mobile	Online Fixed	Online Mobile
Awareness / Information Phase				
Learning about new brands and products	Digital Displays	Location-Based In-Store Advertising	Search Engine Marketing	Location-Based Marketing
Consideration / Negotiation Phase				
Searching for additional information on product details	Digital Shelf Extensions	QR-Codes	Search Engine Optimization	Location-Based Recommendations
Purchase / Agreement Phase				
Completing the purchase	Online Stored Value Payment	Mobile Payment with NFC	Digital Currency	Mobile Payment without NFC
Fulfilment / Realization Phase				
Obtaining the product	In-Store Pick-Up	Service App	Same Day Delivery	Service App
Loyalty / Using Phase				
Engaging with the store after sale	Loyalty Cards	In-Store Behavioral Targeting	Customer Relationship Management	Social Media

Table 2.2 Examples of digital capabilities for LOORO on the Customer Journey (based on Court et al., 2009)

This paper aimed at making a first contribution regarding the challenges faced by local commerce in view of digitalization of retail according to their special background and obstacles. It is meant as first step and introduction to the topic. In future, we plan to conduct empirical research on the current state of digitalization and the options of local retailers to address the discovered gaps between their perceptions of and the actual customers' expectations with regard to digital shopping-convenience. Some examples to be studied include mobile payment, digital shelf extensions, online marketing, and co-operative logistics solutions allowing for same-day delivery and how these could be used for digital business model innovations by local retailers.

3. Digitalization of Local Owner Operated Retail Outlets: The Role of the Perception of Competition and Customer Expectations

3.1 Publication Details

Abstract: On the one hand, the increasing digitalization of commerce has put local owner operated retail outlets (LOOROs) under pressure to adapt their business models to the new technological and competitive environment as well as to the changing shopping habits of their customers. On the other hand, it also offers potential competitive advantages for them. This paper investigates the retailers' perception of the competition and their perception of customer expectations, combined with a survey of the current use of digitalized services and the LOOROs readiness to increase the usage of digitalized services. Our results confirm that the perception of competitive pressure and customer expectations has a positive influence on LOOROs' readiness to adopt new technologies and business models. But a significant number of the surveyed retailers underestimate the expectations of their customers and are reluctant to add digital services to their business portfolio. While our key findings are relevant insights for all LOOROs on their journey towards digitalization, our findings provide even more significant insights for all digital service providers aiming to take a slice of the still substantial market shares of LOOROs in rural areas.

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Arbnesh Sutaj, Prof. Dr. Peter Weber

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(PACIS) 2016 Proceedings. Paper 348.
<http://aisel.aisnet.org/pacis2016/348>

3.2 Introduction

The retail landscape is experiencing seismic changes. The low growth rate environment puts local owner operated retail outlets (LOORO) under immense pressure (HDE, 2015, p.7). On the German market, the market share of the business model LOORO has fallen from 30% in 1995 to only 14% in 2014 (Ben-Shabat et al., 2015, p.3). In 2014, LOOROs suffered the sharpest decline in turnover of all retail outlets in Germany and the future outlook for LOOROs is also bleak. A further turnover decline of about 30% by 2020 or 2023 has been forecast (IFH, 2015; Heinemann, 2014). Despite the huge growth rates in online retail (17.8% in 2014 (HDE, 2015, p. 9)), the German retail landscape is still dominated by stationary and locally rooted businesses, and LOOROs constitute an important income source for many communities (HDE, 2015, pp. 3-14). Although online retail only had a market share of 11.1% (Statista, 2015) in 2014, it has significantly influenced the whole sector with regard to shopping convenience and service quality (Heinemann and Schwarzl, 2010, pp. 2-10). On the one hand, the growing influence of e-commerce, which manifests itself not just in the online presence of "pure players" but also in an increased digitalization of traditionally stationary retail outlets as well as the changing shopping habits of their customers (IFH, 2014, p. 38, Hudetz et al., 2011, pp. 3-8), has put enormous pressure on LOOROs and has brought retailers with a traditional business models to their knees. On the other hand, a custom-made digitalization strategy tailored to their specific customers also offers potential opportunities to LOOROs with regard to customer satisfaction, competitive advantages, and increased market share (Navickas et al., 2015, p. 4).

However, the diffusion of digital retail services seems to hit a barrier for most LOOROs, as only very minor steps towards digitalization can currently be observed (Bollweg et al. 2015, p. 8). This brings us to the question to what extent LOOROs are ready to face the digitalization challenge. Retail research has shown that increased competition and changed or increased customer expectations normally act as a driver for innovation for small and medium-sized enterprises (SME), as they are traditionally characterized by flexibility in their trade structure. But due to the continued decline of LOOROs, which is forecast to continue and speed up in the next years, it is not known whether LOOROs will be able to weather the digital challenge. This is why we decided to conduct a survey of LOOROs in a medium sized town of 46000 inhabitants about their perception of digitalization and their own position within this development. This survey was then correlated with a third-party survey conducted on shoppers in the same town about their shopping habits and their view on the

increased digitalization of retail. Our main research question is, “Do LOOROs realize that digitalization is here to stay and that they will have to adapt to the new retail environment?”

The remainder of this paper is organized as follows: The literature review following in section 3.3 first gives an overview of related studies looking at the adoption of e-business and e-commerce technologies by SMEs. We will then examine the literature body for indications about the impact of the perceived competition and customer expectations on the adoption decision. In section 3.4, we develop the conceptual model concerning the perception of competition and customer expectations regarding the adoption of digitalization in LOORO and derive the hypotheses. The analysis of this model is presented in section 3.5, and the results are discussed in section 3.6. The paper concludes with a summary and an outlook to future research.

3.3 Literature Review

Business informatics offers a number of theoretical models for the adoption of innovation and technology in SMEs that have been tested and validated in numerous studies. Ramdani and Kawalek (2007) have identified the following models: Technology – Organization – Environment Framework (TOE-Framework), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Combined TAM and TPB, TAM2, Diffusion of Innovation Theory, Resource-Based View, Stage Theory and Unified Theory of Acceptance and Use of Technology (UTAUT). They have shown that in each of the nine models factors from the areas of technology, organization or environment are studied with regard to their influence on the decision to adapt. The Technology-Organization-Environment Framework (TOE-Framework) by Tornatzky and Fleischer (1990) addresses these areas directly and has been tested and validated in several studies. Therefore, we have chosen this model as a basis for our research.

To get an overview about the current state of research using the TOE-Framework in the context of adoption of new technologies in SMEs, we conducted a structured literature review concerning this field. We searched with the keywords “TOE-Framework”, “SME” and “adoption” for journals and conference contributions in the databases of EbscoHost, ScienceDirect and Google Scholar. To reduce our starting collection of 138 Papers we examined all abstracts and selected 22 papers with a clear focus on the TOE-Framework and the adoption of technologies for further investigation. This literature body has been fully analyzed by us and it turned out that 13 of the 22 papers had also a section on SME. In the

final 13 papers, we found two kinds of studies fitting to our requirements. The first group was designing general frameworks for examining the adoption of technology in SMEs without defining specific technologies within their model (e.g., Rashid, 2001; Ramdani and Kawalek, 2007). The second group of studies was very specific and had a clear focus on well-defined technologies, i.e., adoption of e-mail, Internet, EDI, VPN (e.g., Premkumar and Roberts, 1999; Al-Qirim, 2007). Both groups have in common that they adapted the TOE-Framework to the needs of their studies and developed it further by adding new categories or new factors within the predefined TOE categories. Most of the designed models remained close to the original TOE-Framework; just a few nearly doubled the number of examined factors (e.g., Rashid, 2001; Chong, 2008). More visible differences appeared with regard to the use of the term SME in the studies. One group of studies used the term as a universally accepted concept without closer definition (e.g., Zhu et al., 2002). A second group of studies was again very specific and had a clear defined research scope with a definition about e.g., company size, industry classification and area of research (e.g., Rashid, 2001). Most of the studies using TOE presented here have gathered the examined data of their studies directly by taking it from surveys and interviews they conducted themselves. The industries discussed and examined in these studies did not refer to similar business sectors (i.e., Tourism, Manufacturing, E-Commerce).

With regard to our research about the visible change of competition (strong growth of E-Commerce) and the changing shopping habits of customers (i.e., online shopping) we finally examined the influence of the factors of perceived competition and the perceived customer expectations with regard to the decision of adapting to a new environment in the TOE studies of our literature body. Our findings show clearly (see Table 3.1) that, whenever mentioned, the factors competition and customer expectations had a visible positive impact on the adoption of new technologies in SMEs.

Now, concerning our scope of research, the question is why there is no comparable development towards digitalization and new technologies in LOOROs by now. Do LOOROs not perceive any competition and customer expectations regarding digitalization?

3.4 Research Framework

In order to pursue our overall research question "Do LOOROs realize that digitalization is here to stay and that they will have to adapt to the new retail environment?" we will examine in more detail the question raised during our literature review: Do LOOROs perceive any competition and customer expectations regarding digitalization?

But first we need to gain a better understanding for the stimulation effects of the factors competition and customer expectation on the adoption process. Both are external factors of the near environment, concerning the three environments model (internal, near and far) of Stapelton (2000). These external factors affect the general environment within a particular SME has to operate (Dholakia and Kshetri, 2004, pp. 2-4). The Stakeholders of the near environment are customers, competitors and suppliers, and these are the main touchpoints of an SME.

Authors	Technologies	Examined factors	Impact on adoption (positive/negative/neutral) (- not mentioned)	
			Customer expectations	Competition
Premkumar, Roberts (1999)	E-mail, online data access, internet access and EDI	Relative Advantage, Cost, Compatibility, Complexity, Top-Management Support, IT Expertise, Size, Competitive Pressure, External Pressure, Vertical Linkages, External Support	-	positive
Rashid (2001)	General framework	Relative Advantage, Complexity, Compatibility, Cost, Image, Competitive Pressure, Suppliers / Buyers Pressure, Public Policy, Governments Role, Size, Quality of IS Systems and Capabilities, Information Intensity, Specialization, Top-Management Support, CEOs Innovativeness, CEOs IS / IT / EC Knowledge	positive	positive
Zhu et al. (2002)	General framework	Consumer Readiness, Competitive Pressure, Technology Competence, IT-Infrastructure, IT Expertise, E-business Know How, Firm Size, Lack of Trading Partner Readiness	positive	positive
Wymer, Regan (2005)	E-Commerce Technologies	Competitive Pressure, Government, Market, Partners / Vendors, Suppliers Readiness, Change Experience, Executive Experience, Innovativeness, Models, Need, Prior Experience, Trust, Understanding, Value, Capital, Employee Reduction, Priority, Profitability, Technical Expertise, Cost, EC Technology, Infrastructure, Reliability, Security, Technology Availability, Other Security Concerns, Reliability, Deployability, Firm Size, Firm Scope,	-	positive
Lippert, Govindarajulu (2006)	Web Services	Technology Knowledge, Perceived Benefits, Competitive Pressure, Regulatory Influence, Dependent Partner Readiness, Trust in Web Service Provider	-	positive
Al-Qirim (2007)	Internet, E-mail, Intranet, Extranet, VPN, Internet, EDI, Website	Size, Information intensity of product, Competition, Buyer / Supplier pressure, Support from Technology vendors, Relative Advantage, Cost, Compatibility, CEOs Innovativeness, CEOs Involvement	positive	positive
Chong (2008)	E-Commerce technologies	Firm Size, Firm Age, Management Support, Perceived Readiness, International Orientation, Relative Advantage, Complexity, Compatibility, Trialability, Observability, Information Sources,	positive	positive

		Communication Channels, Communication Amount, Pressure from Trading Partners, Competitive Pressure, Relevant Environmental Participation, Non-trading, Institutional Influence, Government Support, Customer Pressure, Supplier Pressure		
Ramdani, Kawalek (2007)	General framework	Relative Advantage, Compatibility, Complexity, Trialability, Observability, Top-Management Support, Organizational Readiness, IS Experience, Size, Industry, Market Scope, Competitive Pressure, External IS Support	-	positive
Oliveira, Martins (2010)	General framework	Technology Readiness, Technology Integration, Firm Size, Perceived Benefits and Obstacles of E-business, Country, Industry, Competitive Pressure, Trading Partner Collaboration	-	positive
Ghobakhloo et al. (2011)	E-mail, Intranet, Extranet, VPN, EDI, Website, ESCM, EFT	Perceived Relative Advantage, Perceived Compatibility, Cost, Information Intensity, CEO Knowledge, CEO Innovativeness, Business Size, Competition, Buyer / Supplier Pressure, Support from Technology Vendors	positive	positive
Alshamaila et al. (2013)	Cloud computing	Relative advantage, Uncertainty, Compatibility, Complexity, Trialability, Size, Top-Management Support, Innovativeness, Prior IT Experience, Competitive Pressure, Industry, Market Scope, Supplier Efforts and External Computing Support	-	positive
Jones et al. (2013)	Enterprise applications	Relative Advantage, Compatibility, Complexity, Trialability, Observability, Top-Management Support, Organizational Readiness, IS Experience, Size, Industry, Market Scope, Competitive Pressure, External IS Support	-	positive
Rahayu, Day (2015)	E-commerce technologies	Perceived Benefits, Compatibility, Cost, Technology Readiness, Firm Size, Customer / Supplier Pressure, Competitor Pressure, External Support, Innovativeness, IT Ability, IT Experiences	positive	positive

Table 3.1 Literature review of influencing factors in the TOE-framework

With regards to the three environments model, this is the group of external factors that an SME can influence. On the other hand the external factors of the near environment (Customers, Competition and Suppliers) have also significant influence on the SME itself and can shape the environmental situation through their actions (Dholakia and Kshetri, 2004, pp. 2-4). This creates pressure, the SME needs to adapt to the new environmental situation. Otherwise the inability or the unwillingness to adopt or the disbelief in the need to the adoption will lead to a competitive disadvantage (Parasuraman et al., 1985, pp. 6-8). And if so, why does the perception of competition and customer expectations regarding digitalization not lead to the adoption of new technologies in LOOROs in the same way as this perception does in other SMEs?

Therefore, we defined a research model with four constructs. The first construct is named “Competition” and is derived from the main sales channels of LOOROs, the local store and the online channel.

It takes the already discussed change in competition for LOOROs (Heinemann and Schwarzl, 2010, pp. 2-10) into the account and is measured by two indicators, the perceived competitive pressure in the local market (C1) and the perceived competitive pressure with the online trade (C2).

The further constructs, “Customer Expectations”, “Current Usage” and “Future Usage” represent the digitalization of retail, each with a different scope. To cover this very general and broad category we derived our constructs from the transaction phase logic. We picked digital examples from the basic transaction phases (pre-sales phase, checkout / fulfilment phase and the after-sales phase). Each construct covers at least one example of each phase. For the construct “Customer Expectations” we have chosen frequently used applications and services, for “Current Usage” already widespread applications and services, and for “Future Usage” advancements or evolutions of the “currently used” applications and services (see Table 3.2 Indicators sorted by transaction phase).

The construct “Customer Expectations” measures the perceived change in customer habits and perceived customer expectations regarding digitalization (IFH, 2014, p. 38; Hudetz et al., 2011, pp. 3-6). It consists of four indicators, the acknowledgement of customers using digital applications accompanying their purchases (CE1), the demand of customers regarding an online shop (CE2), regarding customer cards (CE3), and regarding home delivery (CE4).

The constructs “Current Usage” and “Future Usage” measure the adoption and likeliness of the future adoption of digital technologies by LOOROs. The construct “Current Usage” is measured by four indicators, the current usage of basic digital applications like e-mails (CU1), EC-Card (CU2), internet (CU3), and loyalty cards (CU4). The construct “Future Usage” is measured by six indicators, the planned future usage of more advanced digital applications like video telephony (FU1), payment via smartphone (FU2), mobile apps with service (FU3), online shop (FU4), social media (FU5), and customer integration (FU6).

Customer Expectations	Current Usage	Future Usage
PRE-SALES (Search and Information)		
Onlineshop	Homepage	Onlineshop APP
	Emails	Video-Telephony Social Media
CHECKOUT / FULFILMENT (Payment and Delivery)		
Digital Applications	EC-Card	Mobile Payment (via Smartphone)
Logistics (Home Delivery)		
AFTER SALES (Loyalty and Customer Care)		
Customer Card	Customer Card	Customer Integration

Table 3.2 Indicators sorted by transaction phase

According to the stated relationship of competitive pressure (competition) and the adoption of new technologies in the TOE-Framework (i.e., Tornatzky and Fleischer, 1990) and the proven positive impact by several reviewed TOE based studies about the adoption of new technologies in SME (see Table 3.1 literature review of influencing factors in the TOE-framework), we define our first hypothesis as follows:

H1: *The perceived high competitive pressure has a positive influence on the current usage of digital services by LOOROs.*

To gain more insights into the strategic development of LOOROs, we extend our examination of the current usage of digital services to the planned future usage of digital services and state the following second hypothesis:

H2: *The perceived high competitive pressure has a positive influence on the plans of using digital services in the future.*

Similar to hypothesis 1, we also want to examine the relationship of customer expectations and the adoption of technologies in SME. Customer expectations are not part of the original TOE-Framework, but are frequently used extensions of the TOE-Framework (see Table 3.1 literature review of influencing factors in the TOE-framework). Additionally, customer expectations are a decisive factor in Service Quality Research like the well-known SERVQUAL Gap-Model (Parasuraman et al., 1985, p. 4). The impact on the adoption of new technologies in SMEs is proved by the reviewed TOE based studies depicted in table 3.1 literature review of influencing factors in the TOE-framework. Therefore, we hypothesize:

H3: *The perceived high customer expectation towards digital services has a positive influence on current usage of digital services by LOOROs.*

Corresponding to our extension of the hypothesis 1, we follow this path and also extend hypothesis 3 to gain more long-term insights into the development of LOOROs:

H4: *The perceived high customer expectation towards digital services has a positive influence on the plans of using digital services in the future.*

To examine, if the current usage of digital services seems to be promising for LOOROs, we want to see if there is a positive relationship between current and planned future usage. We assume that in those cases where a LOORO is benefitting from using digital services, they will be likely to use digital services in future. According to that assumption we state the last hypothesis:

H5: *The current usage of digital services by LOOROs has a positive influence on their plans of using digital services in the future.*

The resulting research model is depicted in Figure 3.1. The resulting questionnaire is given in Table 3.3.

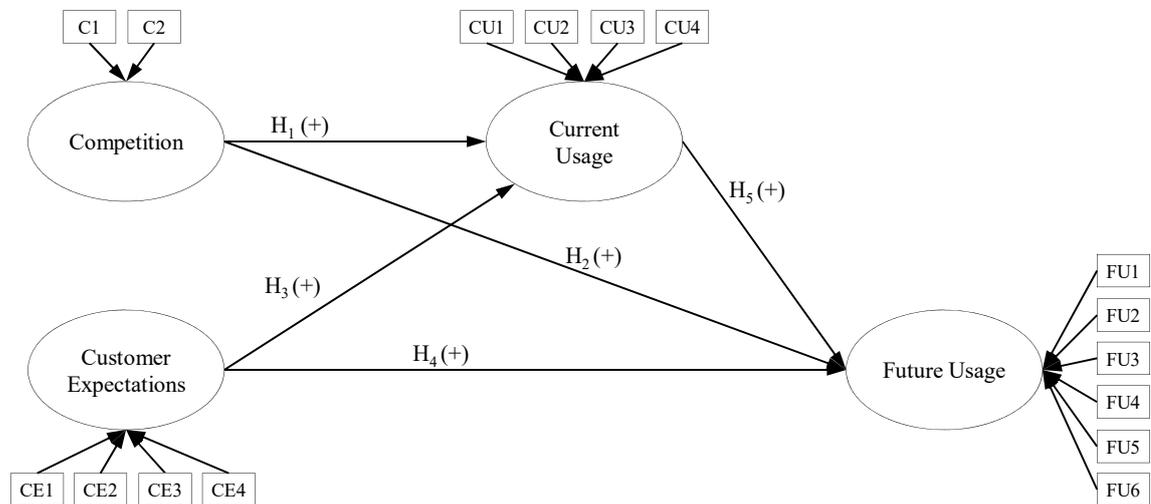


Figure 3.1 Research model

Construct	Indicator	Question
Future Usage	FU1	How would you rate the intention of future use of video telephony as a means of corporate communications for your business?
	FU2	How would you rate the intention of future use of payment by smartphone (mobile wallet, NFC) for your business?
	FU3	How would you rate the intention of future use of an app with service (consultation or sale) for your business?
	FU4	How would you rate the intention of future use of an online shop for your business?
	FU5	How would you rate the intention of future use of social media for your business?
	FU6	How would you rate the intention of future integration of customers in decisions about your product range for your business?
Current Usage	CU1	How would you rate the frequency of current use of e-mails as a means of corporate communications for your business?
	CU2	How would you rate the frequency of current use of EC and credit card payment for your business?
	CU3	How would you rate the frequency of current use of an internet site for your business?
	CU4	How would you rate the frequency of current use of a loyalty card for your business?
Competition	C1	How high is the competitive pressure on the local market?
	C2	How high is the competitive pressure in the online trade?
Customer expectations	CE1	How often do you acknowledge that your customers use digital applications accompanying the purchases in your store?
	CE2	How high is the customer demand for an online shop?
	CE3	How high is the customer demand for loyalty cards?
	CE4	How high is the customers demand for home delivery?

Table 3.3 Questionnaire

3.5 Analysis

3.5.1 Data Collection

The data was gathered in February 2015 in the context of a survey of local owner operated retail outlets (LOOROs) in a medium sized town (46000 inhabitants, City of Soest). The survey was supported by the local business marketing agency (Wirtschaft & Marketing GmbH, WMS) of the town. The WMS agency provided the addresses of 135 retail outlets, of which 85 corresponded to the parameters set for this survey, i.e., local owner operated retail outlets (relevant parameters were normal opening hours, a stationary retail outlet, not a chain store, fast moving consumer goods). Of the 85 LOOROs that were personally invited to take part in the survey, 44 completed the survey in paper form (51.8%) and 8 (9.4%) via an online form. So we received 52 responses in total. All survey questions were measured in a 5-point-Likert-Scale.

In order to analyze the data gathered and to investigate the correlation between the different constructs proposed by the hypotheses, we used structural equation modelling that consists of an outer and an inner model. The outer model, called the measurement model, defines the relations between constructs and indicators, while the inner model, the structural model, represents the relations between the constructs (Fornell and Larcker, 1981 p. 39; Chin, 1998a, pp. 312-318).

We used SmartPLS for the statistical data analysis, which allowed us to use a PLS algorithm and bootstrapping as resampling method (i.e., Ringle et al., 2005). As the PLS algorithm does not calculate all relations at the same time, but only subsets of data (Hair et al., 2014, p. 14), its results are reliable, even for small samples. The minimum sample size is determined by two rules, it is either 10 times the largest number of formative indicators used to measure a single construct or 10 times the largest number of structural paths directed at a particular construct in the structural model (Hair et al., 2014, p. 51). Our model missed the first rule just marginally (6 formative indicators in construct Future Usage) but complies with the requirements of the second rule. With three structural paths as the largest number of structural paths directed at a particular construct of the model, 30 cases would be required and we used 52.

The bootstrapping method, used on 5000 samples and 52 cases, was used to determine significance, loadings, weights and path coefficients (Chin, 1998b, p. 323). In order to ensure that there is no multicollinearity of the indicators, the findings were additionally cross-referenced using SPSS.

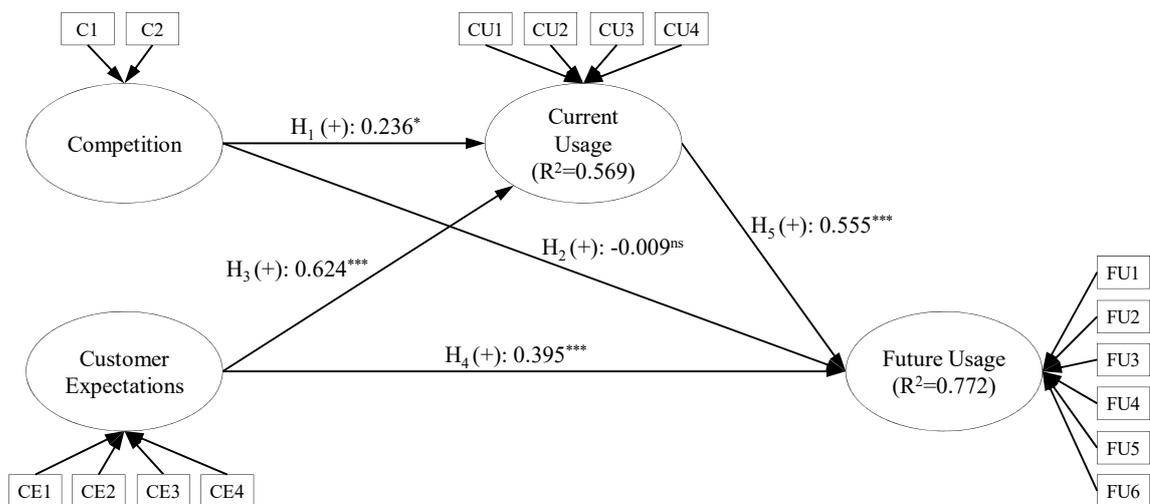


Figure 3.2 Results of the PLS Algorithm

3.5.2 Measurement Model

The two kinds of constructs underlying the measurement model, reflective and formative constructs, have different analysis requirements (Fornell and Bookstein, 1982, p. 442). But as the current model uses only formative constructs, the reflective constructs need not be considered here. The given formative constructs are built by their indicators, which means that a change in one of the indicators will also alter the construct. But an alteration in the construct will not influence its indicators (Bollen and Lennox, 1991, p. 306; Jarvis et al., 2003, p. 200). In order to assess the significance of an indicator, the weights and the t-values have to correspond to the following requirements: The t value of a significant indicator must be higher than 1.65, which corresponds to a significance level of 10% (Hair et al., 2006, pp. 664-670). In order to reach a significance level of 5% (1%), the t-value must be higher than 1.96 (2.57) (Hair et al., 2006, pp. 664-670; Huber et al., 2007, p. 104). In addition, the weights must be higher than 0.1 (Chin, 1998b, p. 324). Table 3.4 show the t-values as well as the corresponding weights for all indicators of our model and also indicates the result with regard to the calculated significance.

For the construct "Future Usage", three (FU2, FU4, FU5) of six indicators are significant having a positive influence. The construct "Current Usage" includes three significant indicators, CU1, CU2 and CU3 each with positive influence. In the construct "Competition" both t-values are higher than 1.96, indicating a 5% level of significance. This again indicates a positive influence of the indicator for the corresponding construct. For the construct "Customer Expectations" only the indicators CE2 and CE3 are significant. The t-value of CE2 is higher than 2.57 (1% level of significance) and the value of CE3 is higher than 1.65 (10% level of significance). The weights of both indicators exceed the threshold of 0.1. In addition to the significance of indicators, the discriminant validity of the formative constructs must be verified. The highest correlation between latent variables is given for the constructs "Current Usage" and "Future Usage" with a value of 0.8357. This does not go beyond the set maximum of 0.9. The analysis conducted using SPSS with regard to multicollinearity showed that all indicators of the models are sufficiently different and independent of each other.

Construct	Indicator	Weights	t-statistic	significance
Future Usage	FU1	0.183	1.366	ns
	FU2	0.431	2.667	***
	FU3	-0.107	0.851	ns
	FU4	0.277	2.145	**
	FU5	0.383	3.218	***
	FU6	0.064	0.629	ns
Current Usage	CU1	0.544	3.261	***
	CU2	0.024	0.301	ns
	CU3	0.273	1.909	*
	CU4	0.495	3.291	***
Competition	C1	0.602	2.241	**
	C2	0.612	2.370	**
Customer Expectations	CE1	0.118	0.853	ns
	CE2	0.807	5.542	***
	CE3	0.245	1.764	*
	CE4	0.175	1.548	ns

ns = not significant; *p<0.10; **p<0.05; ***p<0.01.

Table 3.4 Path coefficients

3.5.3 Structural Model

In order to validate the model, the constructs were assessed using the variance inflation factor ($VIF=1/(1-R^2)$) as to potential multicollinearity (Weiber and Mühlhaus, 2010, p. 207). The VIF is lower than the required level of 10, which shows that there is no multicollinearity here either (Diamantopoulos and Winkelhofer, 2001, p. 272; Huber et al., 2007, p. 38). The value of R^2 represents the coefficient of determination, which indicates a substantial influence if the value exceeds 0.67. Above the value of 0.33 a moderate influence of a latent independent variable on the dependent latent variable can be assumed. A weak influence is indicated by an R^2 value of higher than 0.19 (Chin, 1998b, p. 323). Figure 3.2 indicates the values for the different criteria of our model. The coefficient of determination of the construct "Current Usage" is moderate with a value of $R^2=0.569$ and substantial with a value of $R^2=0.772$ concerning the construct "Future Usage".

The t-values stated in Table 3.4 and their path coefficients allow conclusions as to the validity of the formulated hypotheses. According to the findings, all relations apart from the one between "Competition" and "Future Usage" (H2) are significant and have t-values of at least 1.65 (Weiber and Mühlhaus, 2010, p. 207).

3.6 Discussion

At first sight, the results of our survey are in line with the findings of the other studies reviewed in section 2. The perceived competitive pressure (H1) as well as the perceived customer expectations (H3) influence the current usage of digital technologies by LOOROs positively. Thereby, the explanatory power of the construct "current usage" is moderate, indicating that the current usage could be explained quite satisfactorily. While the influence of the perceived customer expectations on the future usage (H4) was also confirmed at a high significance level (1%), the influence of the perceived competitive pressure on the future usage (H2) was not. As to hypothesis H5, contending that the current usage has a positive impact of the future usage, H5 was also confirmed with high significance (1%), the competitive pressure indirectly influences the future usage. The main drivers for the usage of digital services are therefore the perceived customer expectations and the already existing use of such services.

While this indicates that the LOOROs already engaging in digitalization are satisfied with their current efforts and expect future business increases through digitalization, this could also mean that LOOROs tend to wait before going digital until the pressure of competition is high enough and they are forced to use digital services, or that LOOROs think they are well prepared for the digitalization and their customers' demand for it. To substantiate this assumption, let us have a look at the descriptive statistics of the survey questions (see Table 3.5). In addition to the questionnaire that we used for our research model, we also asked several additional questions (AQ1-AQ4) concerning the status quo of LOOROs and their state of digitalization.

As we can see, about half of the interviewees feel high and very high pressure concerning the local as well as the online market. Following hypothesis H1, this should mean that the current usage of digital services is also quite high. But in fact, this is only the case for e-mail and EC payment. Loyalty cards as well as website are rated high or very high by less than a third. This picture continues when looking at the intention for future usage of digital services. Except for the online shop, less than a quarter of the interviewees indicate a high or very high intention to use digital services in future. The reason for this lies in the perceived customer expectations. Less than one third of LOOROs perceive a high or very high demand of customers for digital services (CE1-CE4 and AQ3-AQ4). But on the other hand, LOOROs feel well prepared for the challenge to digitalize (AQ1 and AQ2) although most of them have very low employee numbers (below ten). Thus, the employee situation is not viewed as barrier to digitalization.

Question		Answer				
Future Usage		very high	high	average	low	very low
FU1	How would you rate the intention of future use of video telephony as a means of corporate communications for your business?	1.9%	0%	7.7%	25%	46.2%
FU2	How would you rate the intention of future use of payment by smartphone (mobile wallet, NFC) for your business?	9.6%	11.5%	15.4%	11.5%	36.5%
FU3	How would you rate the intention of future use of an app with service (consultation or sale) for your business?	0%	3.8%	13.5%	17.3%	38.5%
FU4	How would you rate the intention of future use of an online shop for your business?	19.2%	7.7%	17.3%	9.6%	28.8%
FU5	How would you rate the intention of future use of social media for your business?	1.9%	19.2%	25%	15.4%	21.2%
FU6	How would you rate the intention of future integration of customers in decisions about your product range for your business?	3.8%	11.5%	34.6%	11.5%	17.3%
Current Usage		very high	high	average	low	very low
CU1	How would you rate the frequency of current use of e-mails as a means of corporate communications for your business?	17.3%	23.1%	26.9%	13.5%	7.7%
CU2	How would you rate the frequency of current use of EC and credit card payment for your business?	40.4%	36.5%	7.7%	5.8%	1.9%
CU3	How would you rate the frequency of current use of an internet site for your business?	17.3%	13.5%	23.1%	21.2%	9.6%
CU4	How would you rate the frequency of current use of a loyalty card for your business?	15.4%	7.7%	15.4%	13.5%	30.8%
Competition		very high	high	average	low	very low
C1	How high is the competitive pressure on the local market?	13.5%	30.8%	28.8%	17.3%	5.8%
C2	How high is the competitive pressure in the online trade?	30.8%	25%	26.9%	9.6%	3.8%
Customer Expectations		very often	often	average	seldom	very seldom
CE1	How often do you acknowledge that your customers use digital applications accompanying the purchases in your store?	7.7%	17.3%	26.9%	26.9%	11.5%
		very high	high	average	low	very low
CE2	How high is the customer demand for an online shop?	7.7%	1.9%	23.1%	17.3%	32.7%
CE3	How high is the customer demand for loyalty cards?	7.7%	11.5%	11.5%	15.4%	40.4%
CE4	How high is the customers demand for home delivery?	17.3%	9.6%	17.3%	17.3%	28.8%
Additional Questions		very high	high	average	low	very low
AQ1	How high is the importance of digitalization for your business?	13.5%	42.3%	19.2%	7.7%	3.8%
		very good	good	average	bad	very bad
AQ2	How is your personnel situation regarding the likeliness to work with digital applications?	19.2%	36.5%	23.1%	7.7%	1.9%
		very strong	strong	average	weak	very weak
AQ3	How strong do you perceive customer churn toward online trade?	7.7%	13.5%	34.6%	17.3%	9.6%
AQ4	How strong do your customers expect digital service offers (e.g., apps, online shop, website) from you?	5.8%	7.7%	21.2%	30.8%	21.2%

The survey was conducted in German, the questions are translated into English

Table 3.5 Descriptive statistics of survey questions

If we link these results with the customer survey conducted by the Retail Institute at the University of Cologne (Institut für Handelsforschung, IFH) in the same town, we observe an alarming gap. 45% of the shoppers interviewed in that survey indicated that they had changed their shopping habits in favor of more online retail. That means that LOOROs do not seem to perceive the raised expectations of their customers as to digital services.

According to the SERVQUAL Gap-Model based on Parasuraman et al. (1985) (see Figure 3.3), our results suggest Gap 1 (actual customer expectations vs. perceived customer expectations).

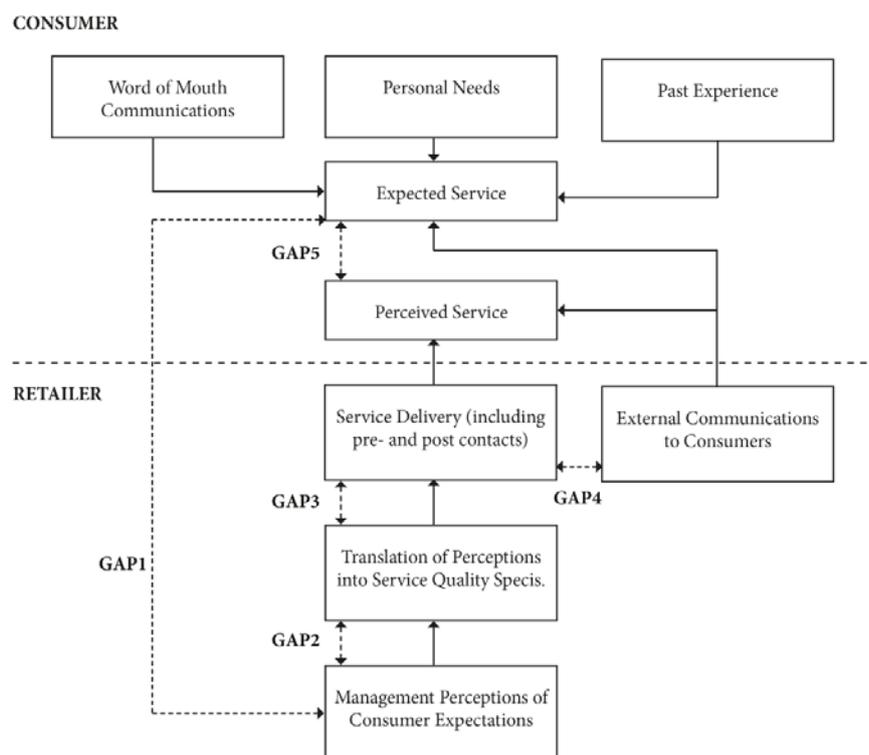


Figure 3.3 SERVQUAL Gap-Model (Parasuraman et al., 1985, p. 4)

This Gap indicates that there is a risk that the services provided by the LOOROs may not correspond to the customer expectations, which will cause customers to have a negative quality perception, as their expectations of digital services provided and the actual services they experience fall short (Gap 5).

In general, the results of our survey are in line with the findings of previous studies based on the TOE-Framework with regard to the adoption of innovation and technology in SMEs. The perception of competition and customer expectations has a positive influence on current

usage of digital services and at least the customer expectations also act as a driving force towards the willingness to adopt digital services in the future. If we go back to our main question “Do LOOROs realize that digitalization is here to stay and that they will have to adapt to the new retail environment?”, the picture is ambivalent. On the one hand, LOOROs in general perceive a high importance of digitalization and feel well prepared for this challenge. But on the other hand, they perceive only low customer expectations with regard to digital services. This indicates a growing gap between actual and perceived customer expectations, which has potentially negative implications for the already difficult competitive position of LOOROs. As LOOROs feel high pressure on the local market as well as online, they should be encouraged to assess their digitalization options and make use of them to regain competitiveness (Navickas et al., 2015, p. 4).

3.7 Conclusion

For owners and managers of retail outlets several lessons can be learned. This study highlights once again the importance of the perception of customer needs and habits for a successful business. Especially LOOROs seem to lose track of their customers’ needs and wants. Owner and manager needs to take countermeasures and start with a step by step digitalization of their business processes. Facing a multitude of uncertainties, it is recommendable to start with targets within easy reach in the short term, such as search engine visibility and third party sales channels to meet the basic digital needs of their customers (IFH, 2014, p. 38; Hudetz et al., 2011, pp. 3-8). In the long-term, LOOROs should try to develop a digitalization strategy that incorporates their local advantages, like short distance to the customers (using e.g., Location-Based Services) and the opportunity to create a touch and feel customer experiences as well as offering their customers the opportunity to take the products into their possession directly (Navickas et al., 2015, p. 4).

Providers of digital services should consider the findings of this study before tailoring their offers for LOOROs. The big group of not-yet-digitially-developed-LOOROs is a challenging but promising business opportunity for all companies that understand the driving force of digital services for local retail on the one hand and the limitations and obstacles those retailers are in on the other hand. Using digital services to foster the connection between LOOROs and their customers once again is just the first step, enhancing the shopping convenience through channel integration and excellent customer service needs to follow right away.

As always, some limitations of our study have to be acknowledged. First of all, the sample size of the survey with 52 participants is rather small. This brings us to the question to what extent the results of this study can be generalized. The respondents form quite a representative group concerning the city where the survey was conducted. 38.5% of all retail outlets and 61.1% of the town's LOOROs responded to the survey. This makes the survey representative for the town and lets us generalize the results to cities of the same size and in a similar regional situation (rural). The town is about 35 km and approximately 45 minutes by car away from Germany's biggest urban area, the Ruhr Area. However, the picture may change in big cities so that the survey is only partly generalizable. Secondly, the survey covers only a small share of conceivable measures of digitalization. In particular, the usage of social media functions was barely touched on. Several measures like channel integration, in-store applications, in-store analytics, real time interaction management, could also be taken into account. But as LOOROs are already reluctant to use the simple measures of digitalization that we surveyed, we can assume that these more sophisticated measures are currently not taken into account either. However, in future studies, more detailed questions concerning the specific scope and direction of digitalization should and will be used.

3.8 Future Outlook

With regard to the findings of this research we suggest the following areas of future research:

1. "What are the barriers of digitalization of LOOROs within in the organization? How strong is the impact of limited capital, limited human resources, limited education, and limited time for strategic planning on the current state of digitalization?"
2. "How realistic is the perception of LOOROs as to the digital competence of their business?"
3. "What are the technological and non-technological options for LOOROs with regard to digitalization and what are the potential risks and opportunities of its implementation?"
4. "What are the most promising digital services and are there special digital services that can be a competitive "local" advantage for LOOROs in the competition with e-commerce?"
5. "What are best practices in LOOROs and what type of options and what type of actions can be derived from them?"

6. Customer Research (Survey) on the questions: “What are the products services and offers that motivate customers to continue to buy in the cities?”
7. Identifying Product characteristics and categories that are most promising for LOOROs.

Integrating the previously mentioned fields of future research, we suggest further to repeat the already conducted survey with an extended sample through surveying LOOROs from a bigger region or area. To gain more generalizability as well as to learn more about the differences of LOOROs in urban and rural areas, the sample should be adjusted to the size (small / medium / big) and the location (urban / rural area) of the surveyed cities.

Section II

Main Study

4. Lost in Digitalization: Why Local Owner Operated Retail Outlets Hesitate to Digitalize their Businesses

4.1 Publication Details

Abstract: A disruptive innovation process in the retail industry threatens the very existence of Local Owner Operated Retail Outlets (LOOROs). The traditional business model of LOOROs is challenged by digitalization pressure imposed by online and offline competitors as well as by changing shopping habits of customers. Despite the manifold digital options to regain competitive power, LOOROs hesitate and struggle in their digital transformation. This paper and the presented study aim to understand why. We conducted a survey among 223 owners of LOOROs from 26 cities in Germany in order to learn about the impact of the internal organization and the external environment of LOOROs on their digitalization process. Our results show that the owners of LOOROs are often decoupled from their near and far business environment, what leads to a wrong self-assessment and implies the risk that the services provided do neither match the competitive environment nor customer expectations. The shop owners' growing uncertainty seems to amplify this alarming development further. They remain passive as they do not know if their infrastructure in place is sufficient for e-commerce activities and, if not, what technologies to invest in to regain competitive power.

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Prof. Dr. Peter Weber

Status of Publication: Working Paper (Submitted to European Conference on Information Systems (ECIS) 2018)

4.2 Introduction

The digital transformation of all parts of the society and of the retail industry in particular poses tremendous challenges to local owner operated retail outlets (LOOROs), which are characterized by a small-sized store area, a limited number of staff and high owner-involvement in the day-to-day business operations (Bollweg et al., 2015, p. 8). Although the overall retail market is growing, the share of LOOROs in Germany constantly declined and hardly reached 18% anymore in 2015 (HDE, 2016, p. 9). Forecasts are even more worrying and predict a decline in revenue of up to 50% within the next ten years (i.e., IFH, 2015; Heinemann, 2014; Siemssen, 2017). Besides strong price and service competition induced by (new) online competitors, reasons for this development are the changing shopping habits of customers, who are getting accustomed to online shopping and services more and more (IFH, 2016, p. 33; Statista, 2017b), and the strategic turnaround of online and offline competitors. While formerly pure online players begin to conquer the cities with physical stores (Liebmann, 2013; Holden, 2017), big-box retail outlets and chain stores are digitalizing their business models and offer multichannel sales and services to their local customers (HDE, 2017, p. 9). All of these factors pressure LOOROs to rethink and adapt their traditional business models.

However, despite their limited resources (e.g., lack of time and knowledge, as well as of human and financial resources, etc.), LOOROs are not defenselessly exposed to this development. Many digital tools and applications, like e.g., digital inventory management systems, online shops, customer relationship management systems (CRM), or also marketing automation tools, could also help them to overcome their inherent restrictions (Bollweg et al., 2015, p. 9) and support them in developing locational advantages in an omnichannel environment (Navickas et al., 2015, p. 4). But as other SME and especially other micro-enterprises (ME), LOOROs still hesitate to actively face the digital transformation and seem reluctant to digitalize their business (Bollweg et al., 2016, p. 13; Pantano and Viasonne, 2014, p. 3). This paper investigates this phenomenon and aims at a better understanding of the reasons why LOOROs hesitate to digitalize their infrastructure and their business processes. Only with such an understanding, options for actions can be derived for shop owners, politicians and city representatives, on how to help local retail grow digital and turn into omnichannel Local Commerce. In particular, this study focuses on the interplay of the internal (organizational) and external (environmental) factors that impact the technology adoption of LOOROs. For this, we conducted a survey among 223 LOOROs from 26 cities to answer the following research questions:

RQ1: *How do internal (organizational) and external (environmental) factors influence the digitalization process of LOOROs?*

RQ2: *Why are LOOROs hesitating to digitalize their business?*

The remainder of this paper is organized as follows: In section 4.3, we discuss the theoretical background based on a structured literature analysis concerning influencing factors on the current use of digitalization in SME retail. In section 4.4, we develop a research framework and a conceptual model based on related theory and the analyzed literature. In section 4.5, we describe the survey design and provide an overview of the results. Subsequently, we discuss our findings in section 4.6, and finally point out implications in order to answer the initial research questions.

4.3 Theoretical Background SME Retail

4.3.1 Methodology / Structured Literature Analysis

Although the relevance and importance of small retailers for city centers, their infrastructure, local economies, or for the labor market is often emphasized by policy and studies (e.g., HDE, 2016, pp. 3-14; IFH, 2016, p. 9), research concerning the technology adoption of micro retailers (ME) like LOOROs is scarce. A reason could be the high diversity of the retail sector that hinders the collection of a sufficient number of retailers to obtain significant and representative results (Bollweg, 2015, p. 5). For this, our structured literature analysis (Webster and Watson, 2002, pp. 3-11) (see Table 4.1) focused on research about SME retail outlets and the adoption of technology by SMEs in general as an equivalent for LOOROs and ME retailers. Doing so, structural differences of SME retail outlets and LOOROs have to be taken into account in the following. We used the databases EbscoHost, IEEE, and ScienceDirect and restricted the search to the years from 2000 to 2017. After deleting all duplicate findings, we received a total of 219 unique papers. Analyzing the title and abstract, we were able to reduce our literature body to 51 publications. Last-mentioned were read completely and in turn yielded a final set of twelve relevant papers that coped with internal and/or external factors influencing the adoption of new technologies.

Time frame: 2000 to 2017	EbscoHost	IEEE	ScienceDirect
Total download: 219 paper	64	51	104
After title and abstract analysis: 51 paper	16	9	26
After full analysis: 12 paper	1	4	7

Table 4.1 Literature analysis

4.3.2 Internal and External Influence Factors of SME Retail

In contrast to the industry sector, the term SME is rather undefined in the retail sector. Mainly, the number of employees is used as a size indicator. While Savrul et al. (2014) follow the definition of the EU commission (EU recommendation 2003/361), other authors limit SMEs to the size of 100 employees (e.g., Rahayu and Day (2015); Kabanda and Brown (2017): <100 employees; Mehrtens et al. (2001): 3-80 employees; Maduku et al. (2016): <50 employees). Also concerning the business types, the papers differ. Kurnia et al. (2015) for example analyzed SME retail chains, while others, like Amin and Hussin (2014), or Kabanda and Brown (2017), focused on single-location outlets.

No.	Author / Year	Internal Factors (Attitude)	Internal Factors (Organization)	External Factors (Environment)
1.	Mehrtens et al. (2001)	Attitude	Organizational Readiness	External Pressure
2.	Erosa (2009)	Prior Use	-	External Pressure
3.	Vize et al. (2013)	Attitude, Prior Use	-	External Pressure
4.	Pantano and Viasonne (2014)	Attitude, Prior Use	Organizational Readiness, Available Resources	-
5.	Pantano (2014)	Attitude, Prior Use	Organizational Readiness	-
6.	Amin and Hussin (2014)	Current Use	Organizational Readiness	External Pressure, Available Resources
7.	Savrul et al. (2014)	Prior Use	Organizational Readiness	External Pressure
8.	Kurnia et al. (2015)	-	Organizational Readiness	External Pressure
9.	Rahayu and Day (2015)	Attitude	Organizational Readiness	External Pressure, Available Resources
10.	Osei et al. (2016)	-	-	External Pressure
11.	Maduku et al. (2016)	Current Use, Prior Use	Organizational Readiness	External Pressure, Available Resources
12.	Kabanda and Brown (2017)	Prior Use	Organizational Readiness	External Pressure

Table 4.2 Categories of influencing factors based on the literature analysis

However, a commonality is the classification of factors influencing the innovation and technology adoption process into the three categories (1) internal attitudinal factors, (2) internal organizational factors, and (3) external environmental factors (see Table 2). In this line, Mehrtens et al. (2001) who focused on internet adoption found that the internal and external factors “perceived benefits”, “organizational readiness”, and “external pressure” significantly influence a company’s decision to adopt technology. Erosa (2009) investigated the role of prior use on technology adoption. As internal factors, she used risk perception,

advantages of IT use, and the owner's perspective. In addition, external technological influence was considered as an external factor. Results show that low use and low use intentions have a negative impact on the actual use of technology. Pantano and Viasonne (2014) present a push-pull approach based on the external push of technology and the pull of retailers' internal demand. In particular, the internal factors have a high impact. The diffusion of technology-based innovation is mainly influenced by retailers' expectations and their propensity to invest. Amin and Hussin (2014) applied an extension of the "Technology-Organization-Environment Framework" to examine technology adoption and showed that technology adoption is a process passing certain stages instead of being a one-level process. Kurnia et al. (2015) combined the Diffusion of Innovation Theory with the National Institutions Perspective to examine the effect of internal factors based on attitudes and several external factors on the technology adoption process. They distinguished external factors of the industry (competition), the nation (government), and the overall environment (society), and showed the importance of the context of retailers for digital development.

4.4 Research Framework & Conceptual Model

4.4.1 Internal and External Influence Factors

While in large firms, decisions are highly influenced by internal groups and are subject to collective, collaborative scrutiny and testing, the decision situation of LOOROs is quite different. As LOOROs are micro-enterprises (Erosa, 2009, p. 1) that often face structural shortage of internal and external resources (Bollweg et al., 2016, p. 13), the owners are intensely involved in the day-to-day business operations and simultaneously act as the executive manager, salesman, and storekeeper (Venkatesh, 2006, pp. 497 - 500). The owner is the company's sole decision maker, who is said to be more influenced by external factors than by (not existing) internal hierarchical structures (Lieberman-Yaconi et al., 2010, p. 80). However, to understand why LOOROs hesitate to digitalize, and to derive options for action for LOOROs, both external environmental as well as internal organizational factors influencing the decisions of LOORO owners to use digital tools and applications for their business need to be examined. Internal factors are – to a certain extent – under the control of the owner (Vize et al., 2013, pp. 10-11; Rahayu and Day, 2015, pp. 143-146). They can be categorized into factors from the organizational-level and from the individual-level (attitudinal) (Erosa, 2009, p. 2; Amin and Hussin, 2014, p. 3). The organizational-level comprises factors concerning the readiness, such as the availability of internal resources

(e.g., human resources, motivation, time and knowledge), as well as the overall organizational commitment towards digitalization. As we focus on the owner as the sole decision maker, factors of the internal organizational-level thus represent “internal external factors” (Marcati et al., 2008, pp. 1579-1580). The individual-level concerns factors like attitude, intentions, and prior and current usage of digital tools and approaches (Erosa, 2009, p. 2; Amin and Hussin, 2014, p. 3; Maduku et al., 2016, pp. 712-713).

In contrast to internal factors, external factors cannot be controlled by the company. These factors can be subdivided into factors related to the competitive environment, governmental regulations, pressure from value chain partners (e.g., suppliers and customers), and the availability of external resources (Vize et al., 2013, pp. 10-11; Rahayu and Day, 2015, pp. 143-146; Kabanda and Brown, 2017, p. 123; Kurnia et al. 2015, p. 1907). Focusing on an owner-centric examination and based on the individual level of the owner’s personal attitudes (Marcati et al., 2008, p. 1583), approaches commonly used to explain the technology adoption of small, medium, and large enterprises on the organizational level like the Technology-Organization-Environment Framework (TOE) are not fully suitable (Ramdani and Kawalek, 2007, pp. 412-413). Therefore, this study uses the Stimulus-Organism-Response Model (S-O-R Model), which focuses on the individual level (Vize et al., 2013, p. 16; Rahayu and Day, 2015, pp. 143-146; Kabanda and Brown, 2017, pp. 123-124; Kurnia et al., 2015, p. 1907).

4.4.2 Stimulus-Organism-Response Model

The Stimulus-Organism-Response Model (S-O-R) of Mehrabian and Russel (1974) originates from the environmental psychology field (Woodworth 1923, p. 244) and is often used in marketing research to examine the customer response to a situational or environmental (external) stimulus. For example, Wang et al. (2011) investigate the impact of web aesthetics with its two dimensions aesthetic formality and aesthetic appeal on psychological reactions of online consumers with the help of the S-O-R model. Lee and Widdows (2011) analyzed the impact of high-technology attributes and Zhang et al. (2014) examined the influence of technological environments and virtual customer experience on customer motivation to participate in social commerce. The main idea behind the S-O-R model is that environmental processes and changes, called stimuli (S), are perceived by an organism (O) and instigate (emotional) reactions of the organism called behavioral response (R) (see Figure 4.1).

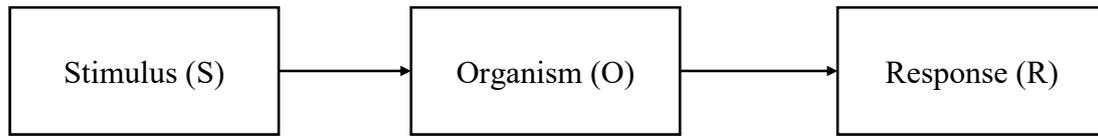


Figure 4.1 S-O-R Model

Based on the environmental psychology, three basic dimensions of emotional responses to the perception of the encountered environments are used: pleasure, arousal and dominance (the PAD-Scale). Thereby, pleasure is described purely in terms of positive or negative feelings, arousal as a feeling state that concerns mental activity, and dominance as a feeling of control and behavior restrictions caused by physical or social barriers (Mehrabian and Russel, 1974, pp. 216-217). However, despite of its contributions to the research on consumer behavior, the S-O-R framework is often criticized for its bipolar measurement when using the PAD-Scale (Kim et al., 2016, pp. 1-2), as it allows the joint occurrence of pleasant and unpleasant states (Westbrook, 1987, p. 259). For this, a unipolar view linking the three dimensions to one joint model is proposed to be more suitable (Bakker et al., 2014, pp. 2-6; Westbrook, 1987, p. 259). Pleasure, arousal, and dominance can be seen as affective (feeling), cognitive (thinking), and conative (acting) responses. Then, these responses can be unified as one joint measure for the organism (Bakker et al., 2014, pp. 2-6).

4.4.3 Conceptual Model

The discussed joint measurement of attitudes is similar to the common measurement of attitudes in Information Systems (IS) theories and related research. Here, a broad range of theories about technology adoption, acceptance and implementation, extent of usage, effectiveness, success, and satisfaction is available (Ramdani and Kawalek, 2007, p. 414). Two streams can be distinguished: Technology centered theories focus on the characteristics of the technology itself and the diffusion through different channels (i.e., Rogers, 1995). These theories are helpful for explaining technology adoption outcomes on an organizational level. In contrast, decision maker centered theories focus on the individual level and analyze human behavior and its impact on the decision-making process regarding technology adoption and use (e.g., Ajzen, 1991; Davis et al., 1989). In this regard, the Theory of Reasoned Action (TRA) (i.e., Ajzen and Fishbein, 1977) and its successor, the Theory of Planned Behavior (TPB) (i.e., Ajzen, 1991) state that attitudes, control beliefs, and subjective norms influence behavioral intention, which in turn influences actual behavior.

Davis et al. (1989) applied TRA / TPB to the individual level of technology adoption behavior in his well-known Technology Adoption Model (TAM). Over the last two decades, researchers extended this view, examined antecedent as well as moderating factors and incorporated alternative belief factors into their research models, like TAM2 or the UTAUT Model, while keeping the core structure (behavioral intention influences actual behavior) of TAM (Ramdani and Kawalek, 2007, pp. 412-413). Furthermore, researchers integrated the TRA / TPB core (attitudes have impact on intentions) into theories of related disciplines. E.g., Koufaris (2002) used constructs from TAM to examine consumer behavior in combination with flow and environmental psychology in an integrated theoretical framework. Accordingly, the organism, namely the owner as the decision maker in LOOROs, is captured by the TRA / TBP logic that the attitude towards a technology influences the intention to use it in order to mimic the thought process of a decision maker (Bakker et al., 2014, pp. 2-6). This thought process is triggered by internal and external stimuli. We postulate that the perception of organizational resource availability and the perception of external pressures can both be seen as such environmental stimuli leading to the organism's emotional reactions (Wang et al., 2011, pp. 47-48). Finally, the usage of the technology is the stimulated organism's emotional response. To frame the ambiguity of the umbrella term digitalization into an operational understanding, we structure the digital tools and applications based on the operational view of the management process of business models: 1) The digitalization of the front-end sales channels, where we find all digitalization efforts with direct customer touch points, and 2) the digitalization of the administrative back-end, invisible to the customer (Enders and Jelassi, 2000, pp. 544-546).

4.4.4 Hypotheses Development

4.4.4.1 Stimulus (S) to Organism (O)

According to the resource-based view (RBV), firm resources are heterogeneous and immobile (Barney, 1991, pp. 105-109). Differences in market performance are fundamentally due to the distinctive resources and capabilities that are valuable, rare, inimitable and non-substitutable (Barney, 1991, pp. 105-109; Wernerfelt, 1984, p. 172). For a company's future competitiveness, prosperity, and development, the availability of resources is decisive. Companies with limited access to resources (e.g., human resources) and with insufficient infrastructures (e.g., capacities) are reluctant to invest in tools and applications that could create a competitive advantage (Barney, 1991, p. 112). The RBV categorizes resources into tangible and intangible resources and distinguishes between

resources on the organizational and individual level. As we focus on the owners of LOOROs (research on the individual-level), resources from the organizational level can be seen as external factors (or stimuli), so-called internal external factors (structural resources from the organizational-level; internal factors of the LOORO but external from the owner's point of view) (Lieberman-Yaconi et al., 2010, p. 80). The availability of the tangible organizational infrastructure is represented by the availability of general resources (AI1), of necessary capacities (AI2), and of an IT-Infrastructure (AI3) (Wernerfelt, 1984, p. 173). To investigate the influence of the available infrastructure on an organism's (O) emotional reactions (attitudes towards digitalization) we hypothesize:

H1: The availability of infrastructure has a positive influence on the attitude towards the digitalization.

The availability of the intangible organizational human resources is represented by the available innovative strength regarding digitalization (HR1), available competences for digitalization (HR2), and available motivation for digitalization (HR3) (Wernerfelt, 1984, p. 173). To investigate the influence of the availability of human resources on an organism's (O) emotional reactions (attitudes towards digitalization), we hypothesize:

H2: The availability of human resources has a positive influence on the attitude towards the digitalization.

Several studies have shown that external environmental pressures have an impact on the adaption of technology among companies (e.g., Amin and Hussin, 2014; Savrul et al., 2014; Kurnia et al., 2015; Rahayu and Day, 2015; Osei et al., 2016; Maduku et al., 2016). The "Three-Environment Theory" offers a structural understanding of the origins of external influences (Stapleton, 2000, pp. 24-30). Correspondingly, external pressures comprise influences from the near and far environment. To avoid repetition, we neglect the application of technological pressure (like in push and pull theory) as the primary influence indicator, as technology is already the theme and research subject of all indicators, especially in the organism (O) and response (R) sections. The near (specific) environment is formed by influences of competitors and customers that exert a direct impact on the examined organization. The perceived pressure of the competitors is represented by the perception of the own development compared to the development of the competitors (PC1), the perception of the need for own development to stay competitive (PC2) and the perception of external pressure towards digitalization to stay competitive (PC3) (Stapleton, 2000, p. 26). Accordingly, we hypothesize:

H3: *Perceived pressure from competitors towards digitalization has a positive influence on the attitude towards digitalization.*

The perceived pressure of the customers is represented by the perception of customer actions (CP1), the perception of customer pressure (CP2), the perception of customer expectations (CP3) (Stapleton, 2000, p. 28). Accordingly, we hypothesize:

H4: *Perceived pressure from customers towards digitalization has a positive influence on the attitude towards digitalization.*

The far environment is defined by the government and socio-political conditions (Melville et al., 2004, p. 286). Thus, the perceived society pressure is represented by the perception of the importance of digitalization (SP1) in general, the perception of governmental pressure (SP2) and the perception of societal expectations (SP3) (Stapleton, 2000, p. 28). Accordingly, we hypothesize:

H5: *Perceived pressure from politics and society towards digitalization has a positive influence on the attitude towards digitalization.*

4.4.4.2 Organism (O) to Response (R)

In the traditional S-O-R models, the organism (O) is represented by the PAD-Scale and its measure of pleasure, arousal and dominance. Despite the undoubted contributions of the S-O-R model for consumer research, the PAD-Scale itself is questionable (Bakker et al., 2014, pp. 2-6) and was often criticized due to its bipolar conceptualization (Kim et al., 2016 pp. 1-2; Westbrook, 1987, p. 259). Therefore, this study replaces the PAD-scale with the core blocks of the established models of TRA/TPB, and TAM, using only one joint construct for the attitude instead of the triad of feeling, thinking, and acting used by Mehrabian and Russel (1974). The attitude as well as control beliefs and subjective norms do not influence actual behavior directly, but rather influence the behavioral intention (intention to use), which in turn influences the actual behavior (current use) (Ajzen, 1991, p. 182; Davis et al., 1989, p. 984). Accordingly, we use the core constructs of the TRA / TPB / TAM theory for the organism section: “Attitude towards Digitalization” and “Intention to use Digitalization”. Attitudes are viewed as predispositions to respond in a consistent favorable or unfavorable manner toward an object or situation, in this study, to the availability of organizational resources and the perception of external environmental pressure. Measures of the construct are oriented to the ones of TRA / TPB / TAM theory: Assessment of digitalization (A1), the ease to learn (A2) and the expected effectiveness of digitalization (A3) (Ajzen, 1991, pp.

181-182; Davis et al., 1989, p. 984). To investigate the influence of attitudes on behavioral intentions to use digitalization, we hypothesize:

H6: *A positive attitude towards digitalization has a positive influence on the intention to use digitalization.*

Behavioral intentions are said to influence actual behavior and therefore to have direct impact on the current use of digital tools and applications (Ajzen, 1991, pp. 181-182; Davis et al., 1989, p. 984). Hence, we hypothesize:

H7: *A high intention to use digitalization has a positive influence on its current use.*

To frame the ambiguity of the umbrella term digitalization into an operational understanding, we separate the back-end from the front-end activities (Enders and Jelassi, 2000, pp. 544-546). The back-end activities of retailers represent all activities without customer touch points; front-end activities are all activities with customer touch points and vary regarding their level of customer interaction (Wirtz et al., 2016, p. 11; Enders and Jelassi, 2000, pp. 544-546). Accordingly, we divide the (behavioral) intentions (“Intention to Use”) and the actual behavior (“Current Use”) towards digitalization into the two dimensions administration and sales. Thus, we extend the above stated hypotheses 6 and 7 as follows:

H6a: *A positive attitude towards digitalization has a positive influence on the intention to use digital administration.*

H6b: *A positive attitude towards digitalization has a positive influence on the intention to use digital sales channels.*

H7a: *A high intention to use digital administration has a positive influence on the current use of digital administration.*

H7b: *A high intention to use digital sales channels has a positive influence on the current use of digital sales channels.*

As representation of the intention to use and the hereinafter current use of digital tools and applications among the stated business areas, we derived sets of frequently used digital tools and applications based on recent studies on technological trends in the retail sector (Statista, 2016).

Digital Sales Channels	online shop (US1)	3 rd party marketplaces (US2)	in-store applications (US3)	online advertisement (US4)
Digital Administration	software for administration (UA1)	inventory management System (UA2)	digital communication channels (UA3)	digital payment systems (UA4)

Table 4.3 Indicators based on frequently used digital tools and applications (Statista, 2016)

The resulting conceptual model is depicted in Figure 4.2.

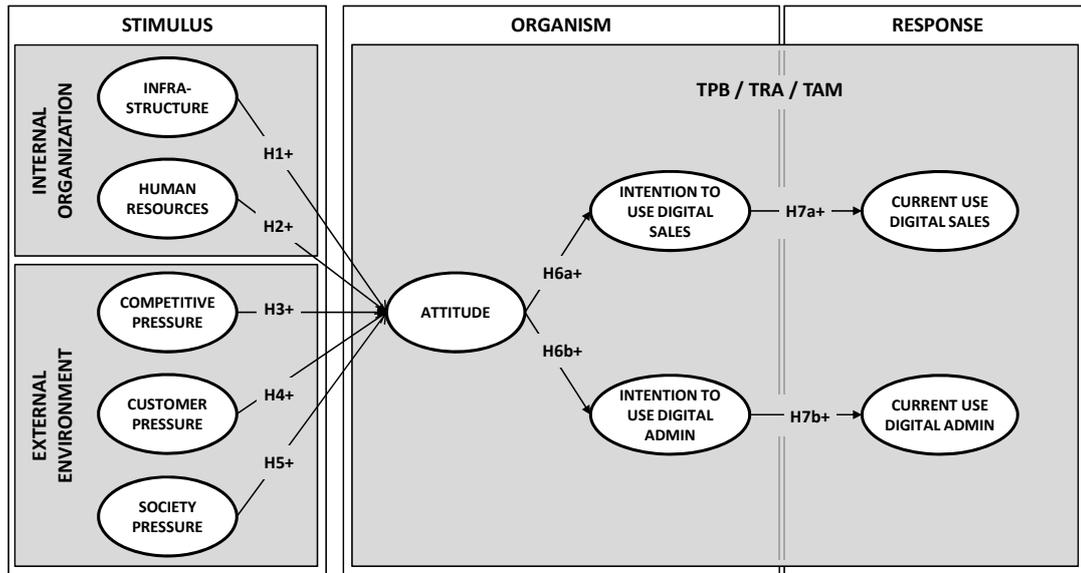


Figure 4.2 Conceptual model

4.5 Analysis

4.5.1 Data Collection

Between May and July 2016, we conducted a survey among LOOROs in 26 cities in the South Westphalia region in Germany. Following informed consent and stating the purpose of the research, the approximate duration, and a statement that participation is voluntary and anonymous, the analyzed questionnaire contained two opening questions (retail industry, no. of employees) and 34 individual questions measured on a 5-point-Likert-Scale. It was answered by 124 participants via an online form and by 119 participants on paper. In total, 243 questionnaires were submitted, including 223 questionnaires with full data sets. For the analysis of the collected data and the evaluation of the research model, we used SmartPLS 2.0 (i.e., Ringle et al., 2005). Bootstrapping was done with 5,000 samples and 223 cases, determining the significance of weights, loadings and path coefficients. For the multicollinearity tests of the formative constructs, we used SPSS.

4.5.2 Measurement Model

The research model has one reflective construct (“Attitude towards Digitalization”). The other nine constructs are formative, so that different analyses are needed (Fornell and Bookstein, 1982, p. 442). The significance of the constructs’ indicators is assessed by their loadings (reflective constructs) that should be greater than 0.7 (greater than 0.6 is acceptable) or weights (formative constructs) that should be greater than 0.1 (Jarvis et al., 2003, pp. 200-205) and their t-values. An indicator is significant if its t-value is greater than 1.65. This corresponds to a significance level of 10%.

ns = not significant; *p<0.10; **p<0.05; ***p<0.01.

Construct	Indicator	Loading / Weight	t-statistics	Significance	VIF	R ²
Available Infrastructure	AI1	0.394	2.595	***	-	-
	AI2	0.661	4.440	***		
	AI3	0.219	2.003	**		
Available Human Resources	HR1	0.023	0.369	ns	-	-
	HR2	0.404	5.316	***		
	HR3	0.671	9.302	***		
Perceived Competitive Pressure	PC1	0.345	2.039	**	-	-
	PC2	0.115	1.072	ns		
	PC3	0.895	9.720	***		
Perceived Customer Pressure	CP1	0.176	1.592	ns	-	-
	CP2	0.797	8.841	***		
	CP3	0.591	5.166	***		
Perceived Society Pressure	SP1	0.591	4.183	***	-	-
	SP2	0.538	4.669	***		
	SP3	0.501	3.865	***		
Attitude	A1	0.839	30.990	***	1.64	0.664
	A2	0.794	23.629	***		
	A3	0.805	22.202	***		
Intention Digital Admin	IA1	0,084	1,075	ns	-	0.084
	IA2	0,473	2,552	**		
	IA3	0,605	4,876	***		
	IA4	0,272	1,514	ns		
Intention Digital Sales	IS1	0,063	0,933	ns	-	0.049
	IS2	0,381	2,196	***		
	IS3	0,714	4,623	***		
	IS4	0,010	0,144	ns		
Current Use D. Admin	CA1	0,115	1,378	ns	-	0.772
	CA2	0,491	2,756	***		
	CA3	0,555	4,309	***		
	CA4	0,302	1,640	ns		
Current Use D. Sales	CS1	0,053	0,800	ns	-	0.812
	CS2	0,351	2,021	**		
	CS3	0,748	5,014	***		
	CS4	0,039	0,571	ns		

Table 4.4 Bootstrapping and model validation

In order to reach a significance level of 5% (1%), the t-value must be greater than 1.96 (2.57) (Hair et al. 2006, pp. 664-670). Table 4.4 shows the t-values as well as the corresponding loadings / weights for all indicators of our model and further indicates the result regarding

the calculated significances. Concerning the reflective construct, all indicators (A1, A2, A3) are significant. As the AVE (Average Variance Extracted) is 0.6609 (minimum > 0.5) and the composite reliability is 0.8539 (min. 0.7), the model fits to the convergence criteria.

The discriminant validity of the constructs is also given. The model complies with the Fornell-Larcker criterion: Its highest squared construct correlation is meeting with 0.557 the AVE maximum of 0.5 and the loadings of the reflective indicators are significantly higher than their cross loadings as compared to the other constructs. The internal consistency is given, as the reflective construct exceeds the critical value of 0.7 for Cronbach's Alpha. Attitude towards Digitalization: 0.7432 (Hair et al., 2006, pp. 664-670). The prediction validity Q^2 is with 0.3201 higher than the minimum of 0 (Hair et al., 2014, pp. 102-103). The results of the formative constructs are as follows: For the construct "Available Infrastructure" (AI1, AI2, AI3), three indicators have significant influences. For the construct "Available Human Resources", two (HR2, HR3) of the three indicators have significant positive influences. For the construct "Perceived Competitive Pressure", two (PC1, PC3) of the three indicators have significant influences. For the construct "Perceived Customer Pressure", two (CP2, CP3) of the three indicators have significant influences. For the construct "Perceived Society Pressure", three (SP1, SP2, SP3) of the three indicators have significant influences. The construct "Intention to Use Digital Sales Channels" comprises two of four significant indicators: IS2, IS3. For the construct "Intention to Use Digital Administration" two of four indicators have significant positive influences (IA2, IA3). The construct "Current Use of Digital Sales Channel" includes two of four significant indicators: CS2, CS3. And finally, for the construct "Current Use of Digital Administration" two of four indicators are significant: CA2, CA3 (see Table 4.4). In addition to the significance of indicators, the discriminant validity of the formative constructs must be verified. The highest correlation between the latent variables is given for the constructs "Intention to Use Digital Sales Channels" and "Current Use of Digital Sales Channels" with a value of 0.9016. This does not match the maximum of 0.9, so that the criterion regarding the discriminant validity is not met (Hair et al., 2014, p. 96). The analysis conducted using SPSS with regard to multicollinearity showed that all indicators of the models are sufficiently different and independent of each other (Hair et al., 2014, p. 125).

4.5.3 Structural Model

In order to validate the model, the constructs with two or more influencing factors (only Attitude) were assessed using the variance inflation factor ($VIF=1/(1-R^2)$) as to potential

multicollinearity (Weiber and Mühlhaus, 2010, p. 207). The VIF of “Attitude towards Digitalization” (1.64) is lower than the required level of 5 and stays even below 3.333 which shows that there is no multicollinearity (Diamantopoulos and Siguaw, 2006, pp. 271-272). The value of R^2 represents the coefficient of determination which indicates a substantial influence if the value exceeds 0.67. A value higher than 0.33 implies that a moderate influence of a latent independent variable on the dependent latent variable can be assumed. A weak influence is indicated by an R^2 value of higher than 0.19 (Van der Heijden et al., 2003, p. 44). The coefficients of determination of the endogen constructs are all substantial: “Current Use of Digital Sales Channels” $R^2=0.813$, “Current Use of Digital Administration” $R^2=0.773$, “Intention to Use Sales” $R^2=0.054$, “Intention to Use Admin” $R^2=0.088$, “Attitude” $R^2=0.672$. The t-values depicted in Table 4.4 and their path coefficients allow conclusions as to the validity of the formulated hypotheses. In sum, all stated hypotheses are significant. The results of the hypotheses are as follows: H1, “Available Infrastructure” has a positive influence on the “Attitude towards digitalization” (H1– effect size $f^2=0.12$; effect size scale: >0.02 = low, >0.15 = medium, >0.35 = high) (Cohen, 1988, p. 81). H2, “Available Human Resources” has a positive influence on the “Attitude towards digitalization” (H2– effect size $f^2=0.38$). H3, “Perceived Competitive Pressure” has a positive influence on the “Attitude towards digitalization” (H3– effect size $f^2=0.03$). H4, “Perceived Customer Pressure” has a positive influence on the “Attitude towards digitalization” (H4– effect size $f^2=0.04$). H5, “Perceived Society Pressure” has a positive influence on the “Attitude towards digitalization” (H5– effect size $f^2=0.01$). H6a, a positive “Attitude towards Digitalization” has a positive influence on the “Intention to Use Digital Sales Channels” (The effect size of 3a, b and 4a, b are not computable due to the model design). H6b, a positive “Attitude towards Digitalization” has a positive influence on the “Intention to Use Digital Administration”. H7a, a high “Intention to Use Digital Sales Channels” has a positive influence on the “Current Use of Digital Sales Channels”. H7b, a high “Intention to Use Digital Administration” has a positive influence on the “Current Use of Digital Administration”. Figure 4.3 shows all significant relations with a t-value of at least 1.65 (Fornell and Bookstein, 1982, pp. 444-445).

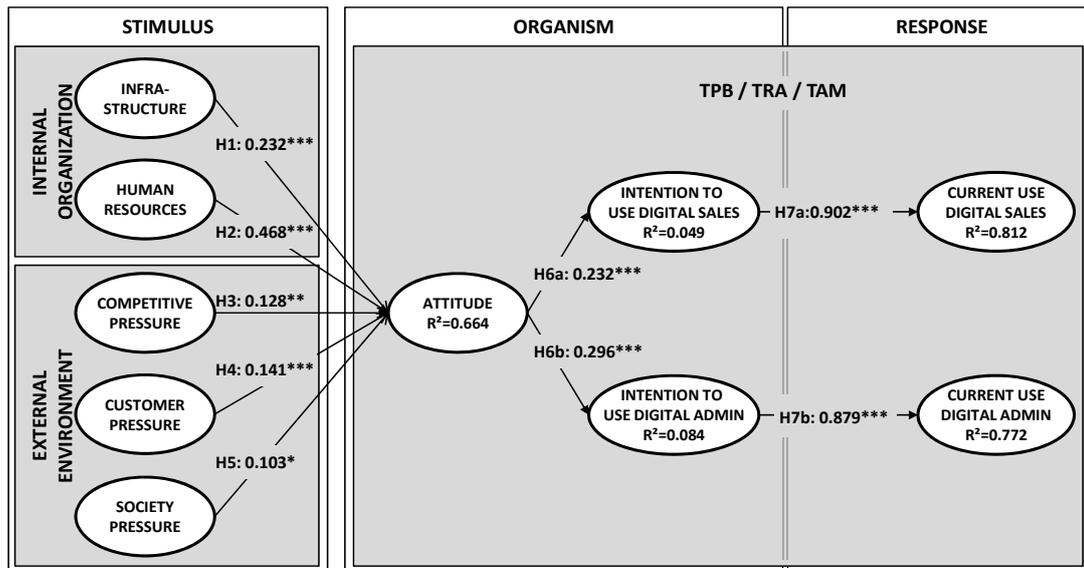


Figure 4.3 Results (*p<0.10; **p<0.05; ***p<0.01)

4.6 Conclusion

4.6.1 Results & Discussion

This study sheds light on the internal states of the owners of LOOROs and on the impact of internal organizational and external environmental influence factors on the current usage of digital tools and applications. The results of our survey among 223 LOOROs in 26 cities in Germany are very satisfactory. The explanatory power of the model is on a high level at 77.2% and 81.2%. All hypotheses could be confirmed of which only two have a significance level of 10% (H5) and 5% (H3). That means that there is a causal chain between the examined external stimuli (organizational and environmental) and usage intention and subsequently current use of digital tools and applications via attitude.

Concerning the first research question, “*How do internal (organizational) and external (environmental) factors influence the digitalization process of LOOROs?*”, our results show a highly significant impact of “Available Organizational Infrastructures” as well as “Available Human Resources” (first, internal organizational stimuli) on attitude and therefore on intention and actual use (see Figure 4.3). But for the organizational infrastructure, the descriptive results show only a low infrastructural readiness of LOOROs. Additionally, the results indicate a high uncertainty among LOOROs regarding the readiness of their existing infrastructure expressed by high neutral responses. Only 31% of the respondents agreed or strongly agreed that they have sufficient “infrastructural resources” to face the digitalization challenge. 43% of the respondents were neutral. Additionally, only 28% confirmed that they have sufficient “capacities”, while 42% answered neutral. Finally,

only 26% stated that they have a sufficient “IT-Infrastructure” for the challenges of the digitalization (28% answered neutral). However, for the “Availability of Human Resources”, our findings show slightly better results. The respondents found their available human resources to have enough “competencies” (44%) and to be “motivated” enough to handle digitalization (58%).

Regarding the external environment (second stimuli), all examined factors also have an impact on the attitude towards digitalization, as all hypotheses could be confirmed (H3, H4, H5). Surprisingly, LOOROs perception of the pressures from the near environment (Customers and Competitors) and far environment (Society) is contradicting the visible digital developments of the external environments. Despite the ongoing digital transformation LOOROs only perceive low pressures. For the “Perceived Competitive Pressure” our results show that the perception of the “own development” compared to the digital development of the competitors (40%) is on a medium to low level. Furthermore, only 54% of the owners of LOOROs perceive a need to participate in the digital transition of retail to stay competitive. With regards to the “Perceived Customer Pressure” towards digitalization, only 11% of the owners perceive “explicit customer expectations” with regards to digitalization. 54% of the respondents at least consider the option that their customers could have according expectations. Finally, the examination of the “Perceived Society Pressure” showed that 85% consider digitalization to be important, while only 56% think that the “society expects digitalization” from them. Furthermore, only 37% feel that the “government is pressuring” them towards digitalization.

Concerning the organism of the model, which is influenced by the examined stimuli, the owners of LOOROs expressed an overall positive attitude towards digitalization. Nearly 60% (addition of strongly agree and agree) have answered that “digitalization is good” (A1) and “easy to learn” (A2) and 52% that digitalization will “increase their effectiveness” (A3). Subsequently, our findings for the “Intention to Use” and the “Current Use of Digitalization” are emphasizing the consequences of LOOROs’ perception of the internal organizational and external environmental influence factors: LOOROs still hesitate to adopt digital technologies and communicate only a low intention to do so in the future. Concerning the usage of digital tools and application on the sales channels, LOOROs report on low usage intentions, with just 12.6% of them confirming their intention to sell on third-party e-marketplaces (IS2). Only 8% of the respondents expressed their intention to use in-store applications (IS3). Further, only 28% of the owners indicated their intention to use an own online shop (IS1),

but surprisingly, nearly 41% stated that they plan to use online advertisement in the future (IS4).

Finally, the results for the response section of the model are in line with the low intentions and the significance of the indicators from the organism and are showing also an overall low “Current Use” of digital tools and applications among LOOROs. Just 9% make use of third-party e-marketplaces (CS2) to sell their products so far and only 2.3% reported a use of in-store applications (CS3). Only 13% of LOOROs operate their own online shop (CS1) and 22.4% use online advertisement (CS4). With respect to the use of digital tools and applications for administrative purposes, the respondents expressed slightly stronger intentions, with 59% of them intending to use administrative software (IA1), 62% planning to use inventory management systems (IA2), and 41% seeking to use digital payment systems (IA4). Concerning the “Current Use”, our results show that 58.3% of owners of LOORO already use administration software (CA1), 56.1% use digital inventory management systems (CA2) and 35% use digital payment systems (CA4). With only 2%, the lowest usage was reported for digital In-Store Application (CA3).

Concerning the second research question, “*Why are LOOROs hesitating to digitalize their business?*”, our results show that LOOROs are facing a shortage of available infrastructure and human resources, and, even more important, that they face a situation of uncertainty. It appears that LOOROs hold and wait with their decision towards digitalization, as they do not know whether their own available infrastructure is sufficient or not and in which technologies to invest. Studies about technology adoption decision making under uncertainty explain this behavior and show that adopters (in this case LOOROs) rarely face a dichotomous choice, to invest now or never, but rather they choose among a series of options to either invest now or postpone the decision (Purvis et al., 1995, pp. 541-542). However, our results show that LOOROs are aware of the importance of digitalization and the external influences. Surprisingly, they do not perceive customer expectations and thus do not see a need to react to digitalization efforts of competitors. The shop owners seem to be disconnected from their near and far environment, leading to erroneous self-assessments and their services losing touch to the relevant competitive environment and customer expectations (Parasuraman et al., 1988, p. 4; Bollweg et al., 2015, p. 8; Pantano, 2014, p. 6). If LOOROs are digitalizing their business, they seem to be more open to digital solutions that improve their day-to-day business operations directly (pace of work, convenience) when compared to digital tools and applications for the actual sales process (Bollweg et al., 2015, p. 11; Navickas et al., 2015, p. 4).

4.6.2 Managerial Implications

The above results bring about important implications for the owners / managers of LOOROs: First of all, LOOROs seem to be decoupled from their near and far environment. They rarely perceive any pressure towards digitalization neither from their customers or competitors, nor from the society who all have already adapted to the digital age and are getting more and more accustomed to digital sales and services channels (Müller-Seitz et al., 2009, pp. 37-38). To reconnect LOOROs with the environmental developments, the owner / manager have to work most importantly on the perception of the current and potential customer needs and expectations (Grewal et al., 2017, pp. 4-5; Parasuraman et al., 1988, p. 4). Secondly, LOOROs neglect opportunities of digital sales channels and are subsequently inexperienced with the according tools and applications. To first experience the digital world, LOOROs should start using online sales and marketing channels with low entry barriers, like third-party platforms (also local shopping platforms), to keep in touch with existing customers, explore new markets and to get started in the e-commerce arena (Standing et al., 2010, pp. 49-50). Thirdly, LOOROs face a phase of uncertainty and thus remain passive. In fact, opposite behavior would make much more sense: LOOROs should continuously analyze and track the digital developments and actively seek for opportunities (Pantano, 2014, p. 6). In doing so they should make use of digital tools and applications with their analytical capabilities and their abilities to help, control and improve important business processes (Cohen et al., 2016, p. 25). Finally, LOOROs seem to be lost in digitalization, their erroneous perception of the external developments indicates a need for an external (public or governmental) push to support the necessary internal turn around for LOOROs to regain competitive power.

4.6.3 Research Implications

This study also has several theoretical implications. The integration of the constructs derived from TRA/ TPB and TAM in the S-O-R Model lead to valid results. The new model thus could serve as a toolbox for future research on micro enterprises. Furthermore, the resulting model contributes to 1) the scarce literature on the technology adoption of ME retailers with insights about the current state of digitalization of local owner operated retail outlets, and 2) to the technology adoption research by means of an examination of the internal organizational and external environmental influence factors. The new model includes an

improved organism (O) section (resulting from the integration of TRA / TPB core constructs) as well as an extended response (R) section and a usage-related examination.

4.6.4 Limitations & Future Research

When interpreting and evaluating the above findings, the following limitations need to be taken into account: 1) LOOROs are not easy to survey and although we collected data from 223 LOOROs in 26 cities, the rather small sample size limits the explanatory power of our findings. 2) This study is based on the context of the German retail industry, where LOOROs have a high market share and are traditionally well established and anchored in society. Therefore, the results cannot simply be adapted to other countries with their specific retail cultures.

Future research would be valuable on at least the following aspects: 1) Technology: Although we looked at tools from several business areas, systematic research is needed to identify promising technologies and digital tools and applications (including e-commerce channels and online marketing strategies) that can help LOOROs improve their businesses and win back competitive power. 2) Technology adoption under uncertainty: As the examined external and internal factors do not cover all factors that are influencing LOOROs' in their decision-making, further studies should investigate what other factors may impact the technology adoption process. Additionally, more research on how to overcome the high uncertainty of local shop owners is needed, as this uncertainty currently clearly hinders the technology adoption of LOOROs. 3) Public and governmental support: Research is needed on how the public can trigger (subsidies, regulations) the digital development of LOOROs.

5. Drivers and Barriers of the Digitalization of Local Owner Operated Retail Outlets: A Case of Retailers in Rural Areas of Germany

5.1 Publication Details

Abstract: A disruptive innovation process in the retail industry threatens the very existence of Local Owner Operated Retail Outlets (LOOROs). The traditional business model of LOOROs is challenged by digitalization pressure imposed by online and offline competitors on the one side and by changing shopping habits of their customers on the other. Despite all digitally-enabled opportunities to regain competitive power, LOOROs still hesitate to adopt digital tools and applications. The aim of this study is to examine drivers and barriers of the digitalization of LOOROs to identify possible trigger points that can promote their digital development. Therefore, we conducted a survey among 223 LOORO owners from 26 cities in the region of South Westphalia, Germany. The results indicate high uncertainty among retailers about what to do and where to begin the path towards digitalization. LOOROs positive attitude towards digitalization is the only driver. Furthermore, LOOROs face manifold barriers, including lack of available resources, low perception of external pressures, low intentions to use and low current use of digitalization. Our findings reveal that the use of digital tools and applications for administration and marketing could work as a suitable trigger to promote digital development and are promising starting points for LOOROs.

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Status of Publication: Working Paper

5.2 Introduction

Local owner operated retail outlets (LOOROs), which are characterized by a small-sized store area, a limited number of staff and high owner-involvement in the day-to-day business operations, are challenged by the transformation of the retail industry (Bollweg et al., 2015, p. 3). Although LOOROs are operating in a growing market environment, they are pressured to adapt their traditional business model to the intense competitive environment of the retail sector (Simón-Moya et al., 2016, pp. 159-162). The market share of the LOORO business type in Germany has already declined from 26% in 2003 to 17.9% in 2015 (HDE, 2016, p. 9). Furthermore, several independent studies predict a decline in revenues of 30% for LOOROs in Germany over the next four years (e.g., IFH, 2015; Heinemann, 2014) and about 50% in the next ten years (i.e., Siemssen, 2017). It is expected, that this development impacts most heavily on the rural areas of the country. Factors contributing to the decline include strong price and service competition from the online trade and the expansion of pure online players that have so far focused solely on online retail to physical stores in the city (Liebmann, 2013; Holden, 2017). Furthermore, big-box retail outlets and chain stores have started to digitalize their business models and offer multichannel sales and services to their local customers (HDE, 2017, p. 9). Customers, on the other hand, have changed their shopping habits: they are already used to online shopping and digital services. Accordingly, their shopping frequency in city centers is diminishing (IFH, 2016, p. 38; Statista, 2017b). However, LOOROs are not defenselessly exposed to the threats of the digital age: digital tools and applications allow them to overcome their inherent limitations (e.g., lack of time, adequate knowledge, human resources and finances, etc.) (Bollweg et al., 2015, p. 3). Additionally, the use of integrated digital infrastructures that enhance locational advantages in the digital world, enable LOOROs to regain competitive power (Li et al., 2016, p. 28; Navickas et al., 2015, p. 4). Examples of digital applications include digital inventory management systems, online shops, customer relationship management systems (CRM) and marketing automation. Despite all opportunities, several studies show that LOOROs, like other small- and medium-sized enterprises (SME) and micro-enterprises (ME), still hesitate to adopt digital tools for their own business (Bollweg et al., 2016, p. 13; Pantano and Viasonne, 2014, p. 3). This paper aims to address this phenomenon by providing a better understanding of the reasons why LOOROs and other SME retailers hesitate to develop a digital infrastructure that could possibly promote their business success. We want to identify options for action and give insights on how to support the digital development of LOOROs in rural areas by examining the internal and external influence factors that have an impact on the technology adoption of local retail outlets in the region of South Westphalia, Germany.

The region of South Westphalia is consisting of Sauerland, Siegerland, Soester Börde and some smaller sub-regions. South Westphalia itself is a region in the federal state North Rhine-Westphalia (NRW). The mostly rural region of South Westphalia is the most sparsely populated region of the federal state NRW and therefore an ideal area for the examination of the upcoming challenges for local retail. Accordingly, this paper aims to answer the following research questions:

RQ1: *What are the drivers and barriers of the digitalization of LOOROs?*

RQ2: *What are potential starting points for LOOROs to grow into digitalization and get ready for the digital future?*

This study is structured as follows: In section 5.3, we discuss the theoretical background based on a structured literature analysis concerning influencing factors on the current use of digitalization in SME retail. In the sections 5.4 and 5.5, we develop a research framework and a conceptual model based on related theory and the results of our literature analysis. In section 5.6, we describe the survey design and provide an overview of the results. Furthermore, we determine the current state of digitalization of LOOROs based on the descriptive and statistical results of the survey, and the assessment of the drivers and barriers of digitalization. Subsequently, we discuss our findings in section 5.7 and point out implications and conclude in section 5.8 in order to answer the initial research questions.

5.3 Theoretical Background SME Retail

5.3.1 Methodology / Structured Literature Analysis

To review and elaborate prior research, we conducted a structured literature analysis (Webster and Watson, 2002, pp. 3-11) (see Table 5.1). While research provided a wide range of publications in the last two decades, focusing on the reluctant innovation and technology adoption of SMEs from the production industry, research concerning the technology adoption of micro retailers (ME) like LOOROs is scarce. This is surprising because many studies point out the importance of small retailers for the local economies, the labor market and traditional infrastructures of city centers (e.g., HDE, 2016, pp. 3-14; IFH, 2016, p. 3). However, high diversity in the retail sector and the resulting difficulty in obtaining an adequate number of retailers to reach a meaningful sample size could explain the low research output on this subject (Bollweg et al., 2015, p. 8). To overcome this shortage of literature, we focused on research about SME retail outlets and the adoption of technology

by SMEs in general as an equivalent for LOOROs and ME retailers. Nevertheless, we will highlight the structural differences of SME retail outlets and LOOROs in the discussion and in the development of the research framework and the conceptual model. Accordingly, we searched for journal and conference contributions from 2000 to 2017 in the databases of EbscoHost, IEEE and ScienceDirect. In the first step of the analysis, we deleted all duplicate findings and received a total of 219 unique papers. Following with a title and abstract analysis, we were able to reduce our literature body to 51 publications. Last-mentioned were read completely and in turn yielded a final set of 12 papers.

Time frame: 2000 to 2017	EbscoHost	IEEE	ScienceDirect
Total download: 219 paper	64	51	104
After title and abstract analysis: 51 paper	16	9	26
After full analysis: 12 paper	1	4	7

Table 5.1 Literature analysis

5.3.2 SME Retail

The term SME retail is rather undefined compared to the term SME used by the production industry. There is no clear and common scale for SME retail suitable for the business types in the retail industry. However, the reviewed papers and studies using the term SME retail mainly classified the examined retailers using the number of employees as a size indicator. Apart from Savrul et al. (2014) (50-249 employees), all other publications considered retail businesses with less than 100 employees as SME retailers. For example, Rahayu and Day (2015) and Kabanda and Brown (2017) analyzed businesses with less than 100 employees. Mehrtens et al. (2001) examined companies within a range from three to 80 employees and Maduku et al. (2016) reduced the sample to companies with less than 50 employees. Furthermore, the reviewed studies showed differences regarding the business types selected for the examination of SME retailers. Some of the studies concentrated their analysis on SME retail chains (e.g., Kurnia et al. 2015), while others had a focus on single-location outlets (e.g., Amin and Hussin, 2014; Kabanda and Brown, 2017).

Despite data sample diversity in terms of the sample size and examination group, the reviewed studies shared one major commonality: the special role of owners / managers of the SME retailers. SMEs are mainly owned and operated autonomously and most of the operating capital is provided by the owners who in turn control and manage the company (Savrul et al., 2014). Subsequently, in SMEs a strategic decision is highly dependent on the owners. A positive attitude of the owners towards change creates an organizational environment that is receptive to innovation (Amin and Hussin, 2014, pp. 4-5). Accordingly,

the owners need to communicate the role of innovation within the SME organization's overall strategy and to emphasize the significance of creativity and innovation to subordinates as well as offering rewards for innovative initiatives to encourage change (Maduku et al., 2016, p. 714). A further characteristic of SME retailers is the structural shortage of internal and external resources (Rahayu and Day, 2015, pp. 143-146). Reluctant technology adoption in retail often depends on limited financial resources and incompetence (Erosa, 2009, p. 4). Additionally, many non-adopter SMEs lack the necessary infrastructure and procedures to adopt digital technology (Kurnia et al., 2015, p. 1907; Kabanda and Brown, 2017, p. 123).

Like the entire retail industry, SME retail is frequently subjected to disruptive innovation (Pantano, 2014, p. 6). SME retailers are pressured by digitally enabled changes of their value chain partners (customers and suppliers), as well as by the competitive environment (multichannel chain stores and pure online trade). Current advancements in technology can enhance the whole value chain, from the consumers' shopping activity to the retailers' job. However, the current strategy of retailers towards technologies does not satisfy customers' expectations (Pantano and Viassone, 2014, p. 3). Customers have already changed their shopping habits and make use of digital sales channels and services and the high convenience of digital services has changed their expectations with regards to services and shopping in local stores. The gap between the service expectations and the current state of digitalization of SME retailers depends on high technological challenges and uncertainties for retailers. Due to the high complexity of digital systems, SME retailers struggle to implement new technologies (Erosa, 2009, p. 1). Accordingly, prior inexperience is negatively correlated to technology adoption in SMEs (Vize et al., 2013, pp. 12-16). Once implemented, SME retailers have problems ensuring system security (Amin and Hussin, 2014, p. 4). In terms of micro and small store formats, technology is an enhancing factor regarding competitiveness, but it is not perceived as attractive to customers (Erosa, 2009, p. 4). It is uncertain whether SMEs retailers can adapt to the digital age on their own. Industry standards are needed to create more certainty for SME retailers so that technology will last (Kurnia et al., 2015, p. 1907). The public sector, governments and other institutions need to support SMEs to reach out to their customers and enable them to succeed in a competitive world (Osei et al., 2016, p. 421). Despite all mentioned challenges, the majority of research also identifies opportunities for SME retail and suggests that retailers should adapt to the digital age. Advanced technology may support firms in extracting knowledge from clients and attracting and maintaining existing ones (Pantano, 2014, p. 6).

5.3.3 Internal and External Influence Factors

Prior examinations of SME retailers lay in the intersection of entrepreneurship, marketing, information science, computer science and psychology. The investigation of certain factors with influence on the current and future development of SME retailers is an interdisciplinary commonality. The influencing factors of innovation and technology adoption process are mainly classified into two types: 1) internal and 2) external factors (see Table 5.2). Mehrtens et al. (2001) examined internet adoption, and argued that a company's decision to adopt technology is influenced by internal and external factors based on attributes of innovation: perceived benefits, organizational readiness and external pressure. The study concludes that these factors have significant effects on the adoption process. Erosa (2009) examined the effects of prior use on technology adoption in SME retail. For measurement, she used three categories of internal factors: risk perception, advantages of IT use and the owner's perspective as well as one category of external factors: external technology influences. The study highlights the negative impact of low use and low use intentions on the actual use of technology by SME retailers in Mexico and the U.S. Pantano and Viasonne (2014) present a push-pull approach based on the external push of technology as well as on the pull of retailer internal demand. The results highlight the high impact of internal factors and reveal that the diffusion of technology-based innovation is influenced by retailers' expectations and their propensity to invest.

No.	Author / Year	Examined Internal Factors	Examined External Factors
1.	Mehrtens et al. (2001)	Attitude, Organizational Readiness	External Pressure
2.	Erosa (2009)	Prior Use	External Pressure
3.	Vize et al. (2013)	Attitude, Prior Use	External Pressure
4.	Pantano and Viasonne (2014)	Attitude, Organizational Readiness, Prior Use	Available Resources
5.	Pantano (2014)	Attitude, Organizational Readiness, Prior Use	-
6.	Amin and Hussin (2014)	Organizational Readiness, Prior Use	External Pressure, Available Resources
7.	Savrul et al. (2014)	Organizational Readiness, Prior Use	External Pressure
8.	Kurnia et al. (2015)	Organizational Readiness	External Pressure
9.	Rahayu and Day (2015)	Attitude, Organizational Readiness	External Pressure, Available Resources
10.	Osei et al. (2016)	-	External Pressure
11.	Maduku et al. (2016)	Organizational Readiness, Prior Use	External Pressure, Available Resources
12.	Kabanda and Brown (2017)	Organizational Readiness, Prior Use	External Pressure

Table 5.2 Categories of influencing factors based on the literature analysis

Amin and Hussin (2014) applied the “Technology-Organization-Environment Framework”, extended by a stage-process to the examination of technology adoption among SME retailers to highlight that technology adoption is not a one-level process, but rather a process that has to go through certain stages. Kurnia et al. (2015) used a model based on the Diffusion of Innovation Theory combined with the National Institutions Perspective to examine the effect of internal factors based on attitudes and external factors of the industry (competition), the nation (government) and the overall environment (society), on the technology adoption process. Their results highlight the importance of the context of retailers for digital development.

5.4 Research Framework & Conceptual Model

5.4.1 Drivers and Barriers of the Decision Making Process of LOOROs

LOOROs are in fact micro-enterprises (Erosa, 2009, p. 1) in which the owners are intensively involved in the day-to-day business operations. These small businesses often face structural shortages of internal and external resources (Bollweg et al., 2016, p. 13). In large firms, decisions are subject to collective, collaborating scrutiny and testing, and are influenced by internal groups to a much higher degree than in micro-enterprises. In LOOROs, the owner is the executive manager, salesman, and storekeeper in personal union (Venkatesh, 2006, pp. 497-500). Hence, the owner-managers of LOOROs are the company’s key decision-makers and they are more influenced by external factors than by (not existing) internal structures (Lieberman-Yaconi et al., 2010, p. 80). To determine options for action for LOOROs, this study aims to examine the external and internal influence factors that have an impact (as driver or barrier) on the owners of LOOROs and their use of digital tools and applications for their business. Internal factors are controlled by the retailer (Vize et al., 2013, pp. 11-12; Rahayu and Day, 2015, pp. 143-146) and can be subdivided into factors from the organizational-level and from the individual-level (Erosa, 2009, p. 2; Amin and Hussin, 2014, p. 3). On the organizational-level, research has examined factors concerning organizational readiness, such as the availability of internal resources (e.g., human resources, motivation, time and current state of education), as well as the overall organizational commitment towards digitalization. On the individual-level, research has analyzed factors concerning the attitude, intentions, use and the usage experience of owners who have a key role in the innovation process of SME retail (Erosa, 2009, p. 4; Amin and Hussin, 2014, pp. 2-5; Maduku et al., 2016, pp. 717-718). External factors are factors that are out of the direct

control of SMEs. These factors are related to the competitive environment, governmental regulations, pressure from value chain partners (e.g., suppliers and customers) and the availability of external resources (Vize et al., 2013, pp. 11-12; Rahayu and Day, 2015, pp. 143-146; Kabanda and Brown, 2017, pp. 123-124; Kurnia et al., 2015, p. 1907).

Based on the characteristics discussed above, this study will scrutinize the impact of the organizational level as an external factor (so called internal external factors) to focus on an owner-centric examination based on the individual level of the owner’s personal attitudes (Marcati et al., 2008, p. 1583). Subsequently, common small, medium and large enterprise-related technology adoption approaches operating on the organizational level (e.g., the Technology-Organization-Environment Framework (TOE)) are unsuitable (Ramdani and Kawalek, 2007, p. 414). This study’s research framework will be built on the Stimulus-Organism-Response Model (S-O-R Model) that operates on the individual level. To synthesize the findings of our literature analysis, we will utilize the following terms for our examination: 1) influence factors, for all measurable internal and external influencers of the innovation and technology adoption process (Vize et al., 2013, pp. 11-12; Rahayu and Day, 2015, pp. 143-146; Kabanda and Brown, 2017, p. 123; Kurnia et al., 2015, p. 1907) and 2) drivers and barriers as contribution-attributes for these factors, with regards to the direction of the impact on the examined innovation process (Harland et al., 2007, pp. 1238-1241).) We postulate that the examined influence factors have an inherent duality. They can either be a driving element which stimulates development towards the observed outcome or a barrier that slows down processes and overall development (see Table 5.3).

	Internal Factors		External Factors
Drivers	Individual Level	Positive Attitude Towards Use High Use Intentions High Usage	High Availability of External Resources High Perceived External Pressure
	Organizational Level	High Availability of Internal Resources High Perceived Internal Pressure	
Barriers	Individual Level	Negative Attitude Towards Use Low Use Intentions Low Usage	Low Availability of External Resources Low Perceived External Pressure
	Organizational Level	Low Availability of Internal Resources Low Perceived Internal Pressure	

Table 5.3 Overview internal and external drivers and barriers of technology adoption based on the literature analysis

5.4.2 Theory and adaptation of the Stimulus-Organism-Response Model

The Stimulus-Organism-Response Model (S-O-R) of Mehrabian and Russel (1974) originates from the environmental psychology field (Woodworth, 1929, p. 244) and is often

used in marketing research to examine the customer response to a situational or environmental (external) stimulus. For example, Wang et al. (2011) investigate the impact of web aesthetics with its two dimensions aesthetic formality and aesthetic appeal on psychological reactions of online consumers with the help of the S-O-R model. Lee and Widdows (2011) analyzed the impact of high-technology attributes and Zhang et al. (2014) examined the influence of technological environments and virtual customer experience on customer motivation to participate in social commerce. The main idea behind the S-O-R model is that environmental processes and changes, called stimuli (S), are perceived by an organism (O) and instigate (emotional) reactions of the organism called behavioral response (R) (see Figure 5.1).

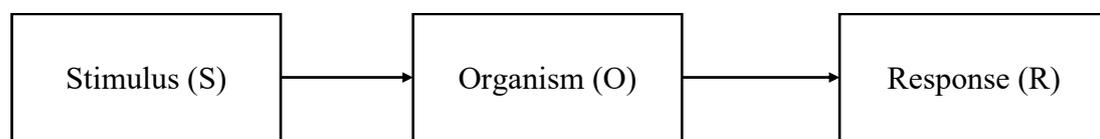


Figure 5.1 S-O-R Model

Despite contributions of the S-O-R framework to the research of consumer behavior, Kim et al. (2016) pointed out that there is an issue with its PAD-Scale, which measures consumers' emotional responses to environmental stimuli on bipolar continua. Westbrook (1987) criticized the bipolar conceptualization of the PAD-Scale for allowing the joint occurrence of pleasant and unpleasant states and proposed a unipolar view as more suitable. In an attempt to overcome this issue, one of the latest reviews of the "PAD-Scale" by Bakker et al. (2014) also highlighted that three dimensions of the PAD-Scale can be linked to one joint model of attitudes: pleasure, arousal and dominance can be respectively affective (feeling), cognitive (thinking) and conative (acting) responses. According to Bakker et al. (2014), the triad of feeling, thinking and acting can be unified as one joint measure for the organism (O). This suggestion of a joint measurement of attitudes is in line with the application of attitude constructs in Information Systems (IS) theories and related research.

5.4.3 Conceptual Model

The discussed joint measurement of attitudes is similar to the common measurement of attitudes in Information Systems (IS) theories and related research. Here, a broad range of theories about technology adoption, acceptance and implementation, extent of usage, effectiveness, success, and satisfaction is available (Ramdani and Kawalek, 2007, p. 414).

Two streams can be distinguished: Technology centered theories focus on the characteristics of the technology itself and the diffusion through different channels (i.e., Rogers, 1995). These theories are helpful for explaining technology adoption outcomes on an organizational level. In contrast, decision maker centered theories focus on the individual level and analyze human behavior and its impact on the decision-making process regarding technology adoption and use (e.g., Ajzen, 1991, Davis et al., 1989). In this regard, the Theory of Reasoned Action (TRA) (i.e., Ajzen and Fishbein, 1977) and its successor, the Theory of Planned Behavior (TPB) (i.e., Ajzen, 1991) state that attitudes, control beliefs, and subjective norms influence behavioral intention, which in turn influences actual behavior. Davis et al. (1989) applied TRA / TPB to the individual level of technology adoption behavior in his well-known Technology Adoption Model (TAM). Over the last two decades, researchers extended this view, examined antecedent as well as moderating factors and incorporated alternative belief factors into their research models, like TAM2 or the UTAUT Model, while keeping the core structure (behavioral intention influences actual behavior) of TAM (Ramdani and Kawalek, 2007, pp. 412-413). Furthermore, researchers integrated the TRA / TPB core (attitudes have impact on intentions) into theories of related disciplines. E.g., Koufaris (2002) used constructs from TAM to examine consumer behavior in combination with flow and environmental psychology in an integrated theoretical framework. Accordingly, the organism, namely the owner as the decision maker in LOOROs, is captured by the TRA / TBP logic that the attitude towards a technology influences the intention to use it in order to mimic the thought process of a decision maker (Bakker et al., 2014, pp. 2-6). This thought process is triggered by internal and external stimuli. We postulate that the perception of organizational resource availability and the perception of external pressures can both be seen as such environmental stimuli leading to the organism's emotional reactions (Wang et al., 2011, pp. 47-48). Finally, the usage of the technology is the stimulated organism's emotional response. To frame ambiguity of the umbrella term digitalization into an operational understanding, we structure the variety of possible digital tools and applications based on the operational view of the business model management process (Wirtz et al., 2016, p. 11; Enders and Jelassi, 2000, pp. 544-546) into four categories of key digital business activities in the retail industry: 1) digital administration, 2) digital marketing activities, 3) digital sales channels and 4) digital services. Accordingly, these four categories will subdivide the organism (O) and the response (R) sections of the model. Finally, we extend the examination of the response (R) section by investigating the relationships between the stated usage segments (Wirtz et al., 2016, p. 11; Enders and Jelassi, 2000, pp. 544-546) to understand the impact of (prior) use of

the precursory business areas on the current use of the following business area (Taylor and Todd, 1995, pp. 561-563).

5.5 Hypothesis development

5.5.1 Stimulus (S) to Organism (O)

The introduced S-O-R framework states that environmental stimuli (S) lead to an emotional reaction of the organism (O) (Mehrabian and Russel, 1974, pp. 216-217). The external influence factors “Availability of Resources” and “Perceived External Pressures” can both be seen as comparable environmental stimuli (Wang et al., 2011, pp. 47-48).

According to the resource-based view, firm resources are heterogeneous and immobile (Barney, 1991, pp. 105-109). Differences in market performance are fundamentally due to the distinctive resources and capabilities that are valuable, rare, inimitable and non-substitutable (Barney, 1991, pp. 105-109; Wernerfelt, 1984, p. 172). In strategic management, resource availability is decisive for a company’s future competitiveness, prosperity and development (Barney, 1991, p. 110). Companies with limited access to resources are reluctant to invest in tools and applications that could create a competitive advantage according to the resource-based view (Barney, 1991, p. 112). The resource-based view categorizes resources into tangible and intangible resources and distinguishes between resources on the organizational and individual level. To meet the stated requirements for research on the owners of LOOROs (research on the individual-level), we integrate external factors and the so-called internal external factors (structural resources from the organizational-level) to one joint set of external resources (Lieberman-Yaconi et al., 2010, p. 80). This joint set of resources is representing tangible and intangible goods and covers the availability of financial resources (AR1), the availability of knowledge needed (AR2), the availability of staff with time for digitalization (AR3) and the availability of necessary capacities (AR4) (Wernerfelt, 1984, p. 173). To investigate the influence of the availability of the discussed resources on an organism’s (O) emotional reactions (attitudes towards digitalization), we hypothesize:

H1: The availability of resources has a positive influence on the attitude towards the digitalization.

Generally external environment is defined by the value chain and trading partners, the government and socio-political conditions (Melville et al., 2004, p. 286). Several studies

have shown that external environmental pressures have an impact on the adaptation of technology among companies (e.g., Amin and Hussin, 2014, Savrul et al., 2014, Kurnia et al., 2015, Rahayu and Day, 2015, Osei et al., 2016, Maduku et al., 2016). In our model, we built on the “Three-Environment Theory” which offers a structural understanding of the origins of external influences (Stapleton, 2000, pp. 24-30). Correspondingly, external pressures comprise influences from the near and far environment. As described in the Three-Environment Theory, the near (specific) environment is formed by influences of competitors (PP1 – competitive pressure) and customers (PP2 - customer pressure) that exert a direct impact on the examined organization. The far (general) environment is formed by influences of economic (PP3), political (PP4), societal (PP5) and technological pressures (Stapleton 2000, p. 26). To avoid repetition, we neglect the application of technological pressure (like in push and pull theory) as the primary influence indicator because technology is already the theme and research subject of all indicators, especially in the organism (O) and response (R) sections. To investigate the influence of the discussed external pressures on emotional reactions (attitudes towards digitalization) of the organism (O) section of the research model, we hypothesize:

H2: Perceived pressure towards digitalization has a positive influence on the attitude towards digitalization.

5.5.2 Organism (O) to Response (R)

In the traditional S-O-R models, the organism (O) is represented by the PAD-Scale and its measure of pleasure, arousal and dominance. Despite the undoubted contributions of the S-O-R model for consumer research, the PAD-Scale itself is questionable (Bakker et al., 2014, pp. 2-6). To address criticism of bipolar conceptualization, which is the joint occurrence of pleasant and unpleasant states in the PAD-Scale (Kim et al., 2016, pp. 1-2; Westbrook, 1987, p. 259), and to improve model performance, this study integrates the core blocks of the established TRA/TPB theory and its successor, the well-known Technology Acceptance Model (TAM). In contrast to the suggested triad of feeling, thinking, and acting by Bakker et al. (2014), TRA/TPB theory applies one joint construct for the attitude. TRA/TPB theory states that attitudes, control beliefs and subjective norms do not influence actual behavior directly, but rather attitudes influence the behavioral intentions (intention to use), which in turn influence the actual behavior (current use) (Ajzen, 1991, p. 182; Davis et al., 1989, p. 984). Accordingly, we will use the core constructs of the TRA / TPB / TAM theory for the organism section: “Attitude towards Digitalization” and “Intention to use Digitalization”.

Attitudes are viewed as predispositions to respond in a consistent favorable or unfavorable manner toward an object or situation, in this study, to the availability of resources and the perception of external pressure. Attitude based on TRA / TPB theory are composed of the subjective norm towards digitalization (A1), the ease of use (A2), expected future developments (A3) and the expected effectiveness of digitalization (A4) (Ajzen, 1991, pp. 181-182; Davis et al., 1989, p. 984). To investigate the influence of attitudes on behavioral intentions to use digitalization, we hypothesize:

H3: *A positive attitude towards digitalization has a positive influence on the intention to use digitalization.*

To frame the ambiguity of the umbrella term digitalization into an operational understanding, we structure the examination of the (behavioral) intention (“Intention to Use”) and the actual behavior (“Current Use”) towards digitalization based on the operational view of the management process of business models for brick and mortar retail stores into four key digital business areas (Wirtz et al., 2016, p. 11). According to Enders and Jelassi (2000), we structure our examination areas based on the back-end activities (administration) towards the front-end activities (services). The back-end activities of retailers are described as all activities without customer touch point; front-end activities are all activities with customer touchpoints and vary on the level of customer interaction (Wirtz et al., 2016, p. 11; Enders and Jelassi, 2000, pp. 544-546). The examination areas are named as follows: 1) digital administration covers all back-end activities without customer touch points and without customer interaction, 2) digital marketing covers all front-end marketing activities with customer touchpoints but without direct customer interaction, 3) digital sales channels cover all front-end sales activities with customer touchpoints and low customer interaction, and 4) digital services cover all digital front-end services with customer touch points and high customer interaction (Enders and Jelassi, 2000, pp. 544-546). Subsequently we extend the above stated hypothesis 3 about the introduced four business areas as follows:

H3a: *A positive attitude towards digitalization has a positive influence on the intention to use digital administration.*

H3b: *A positive attitude towards digitalization has a positive influence on the intention to use digital marketing.*

H3c: *A positive attitude towards digitalization has a positive influence on the intention to use digital sales channels.*

H3d: *A positive attitude towards digitalization has a positive influence on the intention to use digital services.*

Based on the TRA/TPB theory, behavioral intentions are shaped by attitudes (control beliefs and subjective norms). Formed behavioral intentions influence actual behavior, and therefore have direct impact on the current use of digital tools and applications (Ajzen, 1991, p. 182; Davis et al., 1989, p. 984). As representation of the intention to use and the hereinafter current use of digital tools and applications among the stated business areas, we derived sets of frequently used digital tools and applications in the retail sector based on recent studies about technology trends in the retail sector (Statista, 2016).

Digital Administration	Digital Marketing	Digital Sales Channels	Digital Services
Internet for Purchase (IA1)	Online Advertisement (IM1)	Own Online Shops (IS1)	Digital Support Services (ID1)
Software for Administration (IA2)	Marketing Support Software (IM2)	Third-party E-Marketplaces (IS2)	Digital Payment Systems (ID2)
Inventory Management Systems (IA3)	Digital Communication Channels (IM3)	In-Store Applications (IS3)	Digital Enabled Delivery Services (ID3)

Table 5.4 Indicators based on frequently used digital tools and applications (Statista, 2016)

According to TRA/TPB theory, which states that attitudes influence behavioral intentions, which in turn influence actual behavior, we state the following hypotheses for all four business areas (Ajzen, 1991, pp. 181-182; Davis et al., 1989, p. 984):

H4a: *A high intention to use digital administration has a positive influence on the current use of digital administration.*

H4b: *A high intention to use digital marketing has a positive influence on the current use of digital marketing.*

H4c: *A high intention to use digital sales channels has a positive influence on the current use of digital sales channels.*

H4d: *A high intention to use digital services has a positive influence on the current use of digital services.*

5.5.3 Response (R) and Prior Use

The use of digitalization in all four examination areas is measured as an indirect response to the examined stimuli “Available Resources” and “Perceived Pressures”. It is the last step in the already introduced chain of relationships stated by the TRA/TPB theory (Ajzen, 1991, p.

182; Davis et al., 1989, p. 984). Our measurement of the current use of digitalization in the examination areas shares the same theoretical structure with intentional constructs (Enders and Jelassi, 2000, pp. 544-546). Instead of behavioral intentions, we examine actual use behavior. For the examination of the business area, our measurement covers the same sets of already introduced digital tools and applications as indicators for current use (CA1-3, CM1-3, CS1-3 and CD1-3). However, the focus on attitude, behavioral and control factors of the TRA / TPB perspective is not fully sufficient. Research has found prior experience and inexperience as important influence factors on the use of technology. Fishbein and Ajzen (1975) stated that the knowledge gained from past behavior will help to shape (behavioral) intentions in the future. Eagly and Chaiken (1993) explained the impact of prior use on behavioral intentions as a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon an individual's response to all objects and situations with which it is related. Zhu and Kraemer's (2005) study on post-adoption of digital tools and applications in the retail industry has shown that the impact of back-end integration on a firm's overall performance is much higher than the impact of front-end integration arguing that back-end integration helps to develop the capability to link fragmented resources, which in turn helps improve overall business performance. Furthermore, back-end integration is more firm-specific and hence more difficult for competitors to imitate (Taylor and Todd, 1995, pp. 561-563). The results of Erosa (2009) point out that back-end service has a higher demand among retailers, and therefore also a higher use. This is in line with several IS studies on technology adoption which show that perceived benefits / relative advantages are a main factor for the implementation of new technologies (Ramdani and Kawalek, 2007, p. 414). According to the reviewed research, we postulate that experience with digital administration in the back-end will have a positive impact on use of digital marketing, and on the front-end areas of digital sales channels and digital services. Subsequently, we state the following hypotheses:

H5: *A high prior use of digital administration has a positive influence on current use of digital marketing.*

H6: *A high prior use of digital administration has a positive influence on current use of digital sales channels.*

H7: *A high prior use of digital administration has a positive influence on current use of digital services.*

H8: *A high prior use of digital marketing has a positive influence on current use of digital sales channels.*

H9: A high prior use of digital marketing” has a positive influence on current use of digital services.

H10: A high prior use of digital sales channels has a positive influence on current use of digital services.

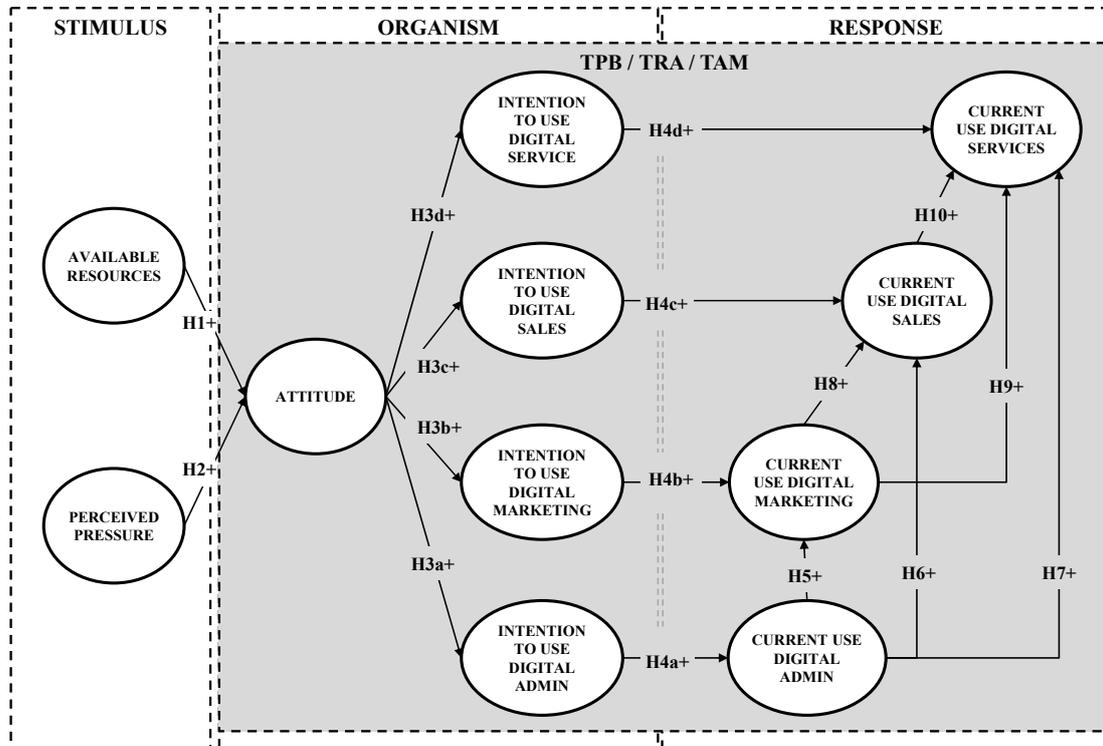


Figure 5.2 Conceptual model

5.6 Analysis

5.6.1 Data Collection

Between May and July 2016, we conducted a survey among LOOROs in 26 cities in the South Westphalia region in Germany. Following informed consent and stating the purpose of the research, the approximate duration and a statement that participation is voluntary and anonymous and that the subject may discontinue participation at any time, the analyzed questionnaire contained two opening questions (retail industry, no. of employees) and 39 individual questions with a 5-point-Likert-Scale. It was answered by 124 participants via an online form and by 119 participants on paper. In total, 243 questionnaires were submitted, including 223 questionnaires with full data sets. For the analysis of the collected data and the evaluation of the research model, we used SmartPLS 2.0 (i.e., Ringle et al., 2005). Bootstrapping was done with 5,000 samples and 223 cases, determining the significance of

weights, loadings and path coefficients. For the multicollinearity tests of the formative constructs, we used SPSS.

5.6.2 Sample & Descriptive Results

The overview of the industry affiliation (based on classification of the German Federal Statistical Office, see Table 5.5) of the investigated local retail outlets shows that with 25.6%, the biggest group of participating retailers sells clothing, fashion and shoes. Other big groups of retailers in this study are jewelers, stationery and office suppliers, as well as opticians, each with a share of 9%. Drugstores, electronic shops, toys and art shops with around 5% represent a variety of special interest shops in city centers, as well as an additional 16% of the examined shops that did not exceed the mark of 1%, which are classified as “other” (see Table 5.5).

Sample Characteristics		(N=223)
	Clothing / Fashion / Shoes	25.6 %
	Jewelry	9.4 %
	Stationery / Office Supplies	9.0 %
	Opticians	9.0 %
Retail	Drugstores	6.4 %
Industry	Household Appliance	5.4 %
Overview	Electronics Shops	4.5 %
(%)	Art Shops	4.5 %
	Toy Shops	4.0 %
	Curtains Shops	3.1 %
	Photographic Shops	3.1 %
	Others (each below 1%)	16.0 %
Ø No. of	Full-time	4
Employees	Part-time	2
/ Shop	Temporary Staff	2

Table 5.5 Industry affiliation and employees / shop

This investigation has excluded grocers from the sample as they operate under different market conditions compared to non-grocers (daily needs, fresh food, only slowly growing online competition, etc.) (Kacen et al., 2013, pp. 1-31). The distribution of industry affiliation is in line with the market share of non-food retailers in Germany and can be considered representative of the German retail sector (Statista, 2017a). All descriptive results are given in Table 5.6.

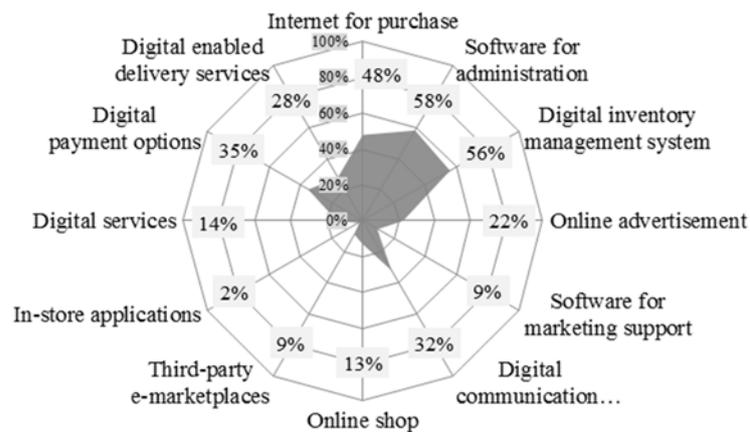


Figure 5.3 Current state of digitalization of LOOROs

5.6.3 Measurement model

The research model has only one reflective construct: “Attitude towards Digitalization”. Attitudes are generally viewed as predispositions in response to a consistently favorable or unfavorable manner toward an object and are therefore reflective. The indicator measures for all other ten constructs are not expected to be correlated (internal consistency is not implied, dropping an indicator from the measurement model may alter the meaning of the construct) (Jarvis et al., 2003, p. 201), and therefore all other constructs are measured in a formative manner so that different analyses are needed (Fornell and Bookstein, 1982, p. 442). The significance of the constructs’ indicators is assessed by their loadings (reflective constructs) which should be greater than 0.7 (greater than 0.6 is acceptable) or weights (formative constructs) that should be greater than 0.1 (Jarvis et al., 2003, pp. 200-205). An indicator is significant if its t-value is greater than 1.65. This corresponds to a significance level of 10%. In order to reach a significance level of 5% (1%), the t-value must be greater than 1.96 (2.57) (Hair et al., 2006, pp. 664-670). Table 5.7 shows the t-values as well as the corresponding loadings / weights for all indicators of our model and also indicates the result with regard to the calculated significance. With reference to the reflective construct, all indicators are significant. The AVE (Average Variance Extracted) is 0.5753 (minimum > 0.5) and the composite reliability is 0.843 (min. 0.7) such that the model corresponds to the convergence criteria. The constructs’ discriminant validity is also given. The model complies with the Fornell-Larcker criterion: Its highest squared construct correlation is with 0.275 below the maximum of 0.5 and the loadings of the reflective indicators are significantly higher than their cross loadings as compared to other constructs. Internal consistency is given as the

reflective construct exceeds the critical value of 0.7 for Cronbach's Alpha (Attitude towards Digitalization: 0.7515) (Hair et al., 2006, pp. 664-670). The prediction validity Q2 is higher than the minimum of 0 by 0.5198 (Hair et al., 2014, pp. 102-103). The results of the formative constructs are as follows: For the construct "Available Resources", three (AR2, AR3 and AR4) of the four indicators have significant positive influences. The construct "Perceived Pressure" includes four of five significant indicators: PP2, PP3, PP4 and PP5. For the other construct, all indicators are significant (see Table 5.7). In addition to the significance of indicators, the discriminant validity of the formative constructs must be verified. The highest correlation between the latent variables is given for the constructs "Intention to Use Digital Sales Channels" and "Current Use of Digital Sales Channels" with a value of 0.8983. This does not exceed the set maximum of 0.9, therefore the discriminant validity criterion is met (Hair et al., 2014, p. 96). The analysis conducted using SPSS regarding multicollinearity showed that all model indicators are sufficiently different and independent of each other (Hair et al., 2014, p. 125).

Indicator	Questionnaire	++	+	o	-	--	n/a
Available Resources (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
AR1	My business is able to invest in digitalization.	5.8%	30.0%	31.8%	14.4%	9.9%	8.1%
AR2	My staff has digital competence.	13.5%	30.9%	36.3%	11.7%	2.7%	4.9%
AR3	My staff has spare time to deal with digitalization.	6.7%	22.9%	37.7%	20.2%	7.6%	4.9%
AR4	My business has sufficient capacity.	7.6%	20.6%	42.2%	19.3%	5.4%	4.9%
External Pressure (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
PP1	I think many of my online competitors are ahead of me in terms of digitalization.	13.0%	27.4%	26.5%	11.7%	7.2%	14.4%
PP2	I think my customers push me towards digitalization.	3.1%	8.1%	33.2%	30.9%	18.8%	5.8%
PP3	I feel pushed towards digitalization.	7.2%	17.5%	34.1%	13.5%	20.2%	7.6%
PP4	I think bureaucracy and public administration push me towards digitalization.	10.3%	26.5%	23.8%	16.6%	9.4%	13.5%
PP5	I think society today expects digitalization in all areas.	16.6%	46.2%	25.1%	5.8%	1.8%	4.5%
Attitude Digitalization (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
A1	I think digitalization is good.	19.3%	39.5%	33.2%	4.9%	1.4%	1.8%
A2	I find digital applications easy to learn.	18.8%	40.8%	29.2%	8.1%	1.4%	1.8%
A3	I think digitalization will be of great importance in the future.	43.1%	39.5%	12.1%	1.4%	0.9%	3.1%
A4	I think that digitalization increases my effectiveness.	15.7%	37.2%	29.6%	8.1%	4.9%	4.5%
Intent. Use Digit. Admin (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
IA1	I intend to use the Internet for handling purchases in the future.	22.9%	29.2%	22.0%	8.5%	9.9%	7.6%
IA2	I intend to use application software for administration purposes in the future.	28.3%	29.2%	13.9%	6.3%	7.2%	15.2%
IA3	I intend to use digital inventory management in the future.	38.6%	23.3%	9.4%	3.1%	14.8%	10.8%
Intent. Use Digit. Marketing (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							

IM1	I intend to use online advertisement in the future.	13.5%	31.8%	19.7%	9.9%	16.6%	8.5%
IM2	I intend to use software for marketing support in the future.	5.4%	17.5%	15.3%	12.6%	35.0%	14.3%
IM3	I intend to use digital communication channels in the future.	17.9%	26.9%	15.3%	9.9%	17.9%	12.1%
Intent. Use Digit. Sales (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
IS1	I intend to operate an online shop in the future.	17.0%	16.1%	14.8%	10.3%	28.7%	13.0%
IS2	I intend to use online selling platforms in the future.	6.3%	10.3%	11.2%	8.5%	39.5%	24.2%
IS3	I intend to use in-store applications in the future.	3.1%	5.8%	8.5%	5.8%	50.7%	26.0%
Intent. Use Digit. Services (I strongly agree – I agree – Undecided – I disagree – I strongly disagree)							
ID1	I plan to use digital services in the future.	5.8%	15.3%	22.4%	9.9%	25.6%	21.1%
ID2	I intend to offer digital payment options in the future.	15.3%	23.3%	16.6%	8.1%	23.3%	13.5%
ID3	I intend to offer digital enabled delivery services in the future.	13.9%	18.8%	19.3%	10.8%	22.0%	15.2%
Current Use Digit. Admin (Very frequently – frequently – occasionally – rarely – very rarely)							
CA1	I currently use software for handling purchases of goods.	27.4%	20.6%	21.1%	14.4%	10.3%	6.3%
CA2	I currently use software for administrative purposes.	34.1%	24.2%	14.8%	7.2%	9.4%	10.3%
CA3	I currently use digital inventory management.	41.3%	14.8%	10.8%	3.1%	23.8%	6.3%
Current Use of Digital Marketing (Very frequently – frequently – occasionally – rarely – very rarely)							
CM1	I currently use online advertisement.	8.5%	13.9%	23.8%	16.6%	30.0%	7.2%
CM2	I currently use software for marketing support.	3.6%	5.8%	11.2%	11.7%	54.7%	13.0%
CM3	I currently use digital communication channels.	12.6%	19.3%	21.5%	13.5%	20.2%	13.0%
Current Use of Digit. Sales (Very frequently – frequently – occasionally – rarely – very rarely)							
CS1	I currently operate an online shop.	8.1%	4.9%	9.4%	5.8%	55.6%	16.1%
CS2	I currently use third party online selling platforms.	4.9%	4.0%	9.0%	8.5%	52.9%	20.6%
CS3	I currently use in-store applications.	1.8%	0.5%	4.9%	3.1%	62.8%	26.9%
Current Use of Digital Services (Very frequently – frequently – occasionally – rarely – very rarely)							
CD1	I currently use digital services.	5.4%	9.0%	16.1%	15.3%	37.7%	16.6%
CD2	I currently offer digital payment options.	17.5%	17.5%	13.0%	6.7%	32.7%	12.6%
CD3	I currently offer digital enabled delivery services.	14.4%	13.5%	17.0%	12.6%	29.6%	13.0%

Table 5.6 Descriptive results and questionnaire

5.6.4 Structural model

In order to validate the model, constructs with two or more influencing factors (only Attitude) were assessed using the variance inflation factor ($VIF=1/(1-R^2)$) as to potential multicollinearity (Weiber and Mühlhaus, 2010, p. 207). The VIF of “Attitude” (1.64) is lower than the required level of 5 and stays even below 3.333, which shows that there is no multicollinearity (Diamantopoulos and Sigauw, 2006, pp. 271-272).

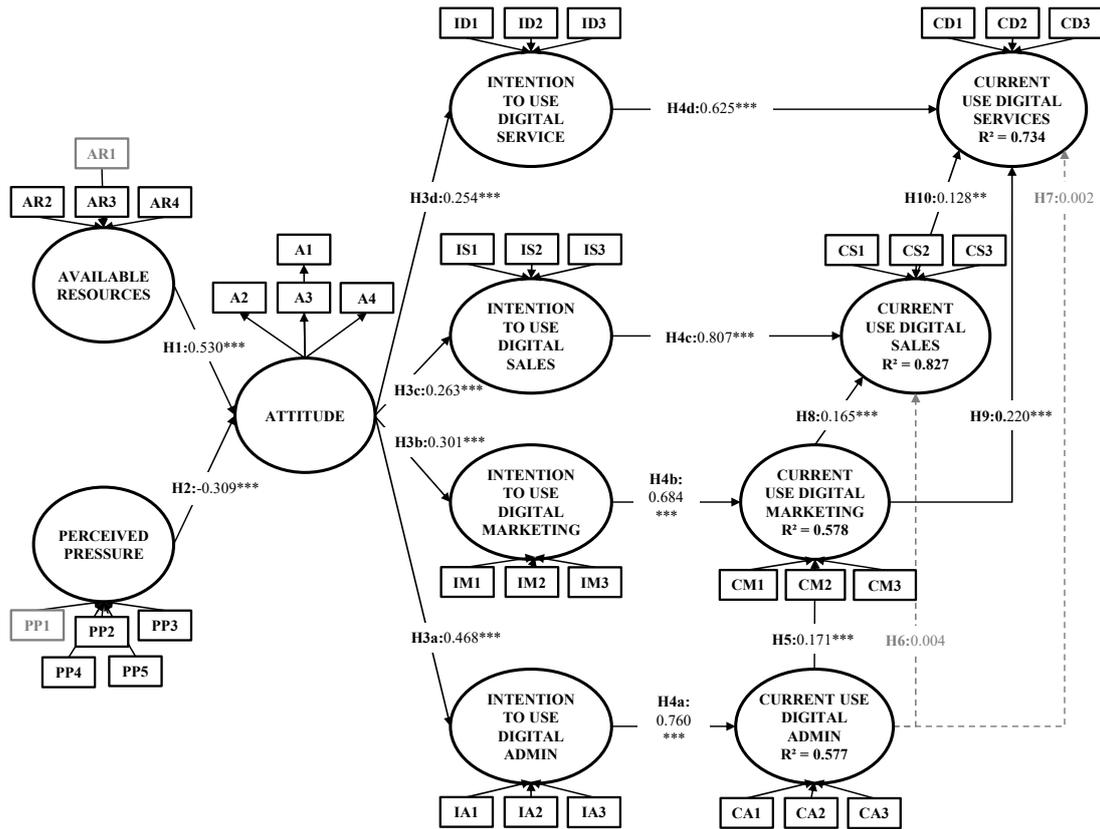


Figure 5.4 Results for research model (* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$)

The value of R^2 represents the coefficient of determination, which indicates a substantial influence if the value exceeds 0.67. A value higher than 0.33 implies that a moderate influence of a latent independent variable on the dependent latent variable can be assumed. A weak influence is indicated by an R^2 value of higher than 0.19 (Van der Heijden et al., 2003, p. 44). The determination coefficients of the endogen constructs “Current Use of Digital Sales Channels” ($R^2=0.827$) and “Current Use of Digital Services” ($R^2=0.734$) are substantial. For the constructs “Current Use of Digital Administration” ($R^2=0.577$) and “Current Use of Digital Marketing” ($R^2=0.578$), the coefficients of determination are moderate. The t-values depicted in Table 5.7 and their path coefficients allow conclusions as to the validity of the formulated hypotheses.

The stated hypotheses H1, H2, H3abcd, H4abcd, H5, H8 and H9 are highly significant (***) - $p < 0.01$). The hypothesis H10 is significant (**) - $p < 0.05$). The hypotheses H6 and H7 are not significant. The results of all hypotheses are given in Table 5.8, including the effect size. The effect size of H3a,b,c,d and H4a are incomputable due to the model design (only one exogenous variable). H6 and H7 are insignificant; hence the effect size is not given. The effect size in the path model can be evaluated by means of Cohen’s f^2 (Cohen, 1988, p. 81).

The effect size f^2 is calculated using the following formula: $f^2 = (R^2_{\text{included}} - R^2_{\text{excluded}}) / (1 - R^2_{\text{included}})$. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 signify small, medium, and large effects, respectively.

Construct	Indicator	Loading / Weight	t-statistics	Significance	VIF	R ²
Available Resources	AR1	-0.023	0.2249	ns		
	AR2	0.5875	4.6963	***		
	AR3	0.2341	2.2906	**	-	-
	AR4	0.365	2.4259	**		
Perceived Pressure	PP1	0.1621	1.2763	ns		
	PP2	-0.4412	3.2087	***		
	PP3	0.6653	5.1521	***	-	-
	PP4	0.3292	2.5385	**		
	PP5	-0.3167	2.0748	**		
Attitude	A1	0.8307	29.5855	***		
	A2	0.7359	14.8221	***	1.64	0.517
	A3	0.6454	9.4994	***		
	A4	0.8082	23.4114	***		
Intention Digital Admin	IA1	0.3853	2.9303	***		
	IA2	0.4019	3.0022	***	-	0.219
	IA3	0.5604	4.0597	***		
Intention Digital Marketing	IM1	0.3185	2.9008	***		
	IM2	0.441	4.3727	***	-	0.090
	IM3	0.503	4.4148	***		
Intention Digital Sales	IS1	0.1397	2.0938	**		
	IS2	0.2749	2.8763	***	-	0.069
	IS3	0.7693	9.6459	***		
Intention Digital Services	ID1	0.5874	5.9558	***		
	ID2	0.4607	4.4341	***	-	0.064
	ID3	0.2449	2.2819	**		
Current Use D. Admin	CA1	0.3893	2.9347	***		
	CA2	0.4593	3.2892	***	-	0.577
	CA3	0.5924	4.1914	**		
Current Use D. Marketing	CM1	0.2435	3.1434	***		
	CM2	0.5327	6.911	***	-	0.578
	CM3	0.5319	5.6913	***		
Current Use D. Sales	CS1	0.2021	2.977	***		
	CS2	0.1814	1.9802	**	-	0.827
	CS3	0.7821	9.9777	***		
Current Use D. Services	CD1	0.5737	6.4948	***		
	CD2	0.5124	5.475	***	-	0.734
	CD3	0.2594	2.792	***		

Table 5.7 Bootstrapping and model validation
ns = not significant; *p<0.10; **p<0.05; ***p<0.01.

All the computed paths have an effect size of minimum small, while five paths (H1, H2, H4b,c,d) have effect sizes greater than the medium effect. Furthermore, Figure 4 shows all significant relations with a t-value of at least 1.65 (Fornell and Bookstein, 1982, pp. 444-445). Thus, the overall model's fit is fairly good.

5.7 Discussion

Concerning the first research question: “What are the drivers and barriers of the digitalization of LOOROs?” LOOROs are facing several internal and external influence factors which explain their current behavior. To assess influencing factors into drivers and barriers, our interpretation is built on the already introduced overview of internal and external drivers and barriers of technology adoption (see Table 5.3). We rate all significant influence factors with regards to the mean value of the positive ratings for their indicators (e.g., addition of strongly agree and agree) on a five level scale: 0% – 20% = strong barrier, 21% – 40% = weak barrier, 41% – 60% = neutral, 61% – 80% = weak driver, 81% – 100% = strong driver.

1) External Factors / Stimulus: For the external factors all stated hypotheses are confirmed. Both available resources and perceived pressures have a highly significant impact on the attitude towards digitalization and thereby influence the technology adoption and innovation process of LOOROs. The descriptive results for the availability of external resources show a clear lack of resources for LOOROs. Only a small number of retailers said that they had sufficient resources in terms of own competence (44% - addition of strongly agree and agree), staff with time for digitalization (30%) and capacities (28%). Also results for the indicator towards financial resources were at a very low level with 36%, but surprisingly this indicator is unverified as significant for technology adoption among LOOROs. However, the assessment shows that lack of resources is a weak barrier for technology adoption and the innovation process of LOOROs (mean: 35%).

For the perceived external pressure, the descriptive results show a moderate perception of pressure from the far environment and a low perception of pressure from the near environment. For the far environment, a moderate perception of pressure is reported for societal pressure towards digitalization (63% - addition of strongly agree and agree), the perception of political pressure (37%) is already at a low to moderate level. For the near environment, LOOROs seem to be decoupled. They perceive only very low pressure from their customers (11%), which is surprising as several studies show that customers have already changed their shopping habits with respect to digital sales channels and services (IFH, 2016, p. 38). Furthermore, and despite growing competition, only 40% of LOOROs perceive pressure from competitors, and, even more surprisingly, this indicator is insignificant for the technology adoption of LOOROs. To sum up, LOOROs perceive only moderate pressure from their far environment and only low pressure from their near environment. It seems that LOOROs are decoupled and do not react to the retail industry

developments and their customers. This isolation is also a weak barrier for the digitalization of LOOROs (mean: 35%).

	Path Coefficients	t-Statistics	Significance	Effect Size f^2
H1	0.530	8.318	***	0.51
H2	-0.309	5.622	***	0.19
H3a	0.468	6.983	***	-
H3b	0.301	3.877	***	-
H3c	0.263	3.935	***	-
H3d	0.254	3.532	***	-
H4a	0.760	20.357	***	-
H4b	0.684	13.709	***	0.98
H4c	0.807	19.728	***	2.56
H4d	0.625	12.158	***	0.92
H5	0.171	3.018	***	0.06
H6	0.004	0.117	Ns	-
H7	0.002	0.056	Ns	-
H8	0.165	3.865	***	0.08
H9	0.220	4.282	***	0.09
H10	0.128	2.241	**	0.02

Table 5.8 Path coefficients, t-statistics, significance and effect size
Effect size scale: >0.02 = low. >0.15 = medium. >0.35 = high

2) Internal Factors / Organism: For the organism's internal factors, all stated hypotheses have also been confirmed for all examination areas. Positive attitudes towards digitalization have a positive influence on the intention to use digitalization. Moreover, strong intentions to use digitalization have a positive influence on the current use of digitalization. With reference to the attitudes, LOOROs are open to digitalization but unenthusiastic. Fifty-nine percent (addition of strongly agree and agree) think that digitalization is good, 60% think that digitalization is easy to learn. Eight-three percent of the respondents are convinced that digitalization will play an important role in the future (A3), but only 53% believe digitalization will increase their effectiveness (A4). This rather positive viewpoint towards digitalization can be assessed as a weak driver (mean: 63%).

For the intentions towards digitalization within the examination areas, we see a diverse picture. For the digital tools and applications of the administrative backend, we see moderate intentions towards use. Fifty-three percent (addition of strongly agree and agree) intend to shop online. Furthermore, 58% of LOOROs plan to use software for administrative purposes and 62% consider the use of a digital inventory management system. However, the mean value of the intentions (mean: 57%) is not high enough to be considered a driver and remain neutral in this area. The intentions towards the use of digital marketing are on a lower level. Forty-five percent intend to use online advertising in the future, but only 23% plan to use marketing support software. However, 45% want to use digital communication channels;

with a mean value of 38% this examination area is also a weak barrier. A much clearer picture is given with respect to intentions to use digital sales channels. Thirty-three percent (addition of strongly agree and agree) of LOOROs intend to use their own online shop, 17% want to sell on third-party e-marketplaces and only 9% seek to use in-store applications in their physical stores. These low use intentions act as a strong barrier (mean: 20%). The same is true for intentions towards digital services. Only 21% have plans to introduce general digital services in the future, 39% want to offer digital payment options and 33% intend to offer digitally enabled delivery services. With a mean value of 31%, it is a weak barrier and it slows down the overall process.

Assessment scale: 0% – 20% = strong barrier, 21% – 40% = weak barrier, 41% – 60% = neutral, 61% – 80% = weak driver, 81% – 100% = strong driver

Construct	Findings	Assessment	
Available Resources	Low available external resources	35%	Weak Barrier
External Pressure	Low perception of external pressure	35%	Weak Barrier
Attitude towards Digitalization	Positive attitude towards digitalization	63%	Weak Driver
Intention to Use Digital Administration	Moderate intentions to use digital administration	57%	Neutral
Intention to Use Digital Marketing	Low intentions to use digital marketing	38%	Weak Barrier
Intention to Use Digital Sales Channels	Low intentions to use digital sales channels	20%	Strong Barrier
Intention to Use Digital Services	Low intentions to use digital services	31%	Weak Barrier
Current Use of Digital Administration	Moderate use of digital administration	54%	Neutral
Current Use of Digital Marketing	Low use of digital marketing	21%	Weak Barrier
Current Use of Digital Sales Channels	Low use of digital sales channels	8%	Strong Barrier

Table 5.9 Overview current drivers and barriers

To sum up: the organism part of the research model is characterized by moderate but positive attitudes and moderate to low intentions to use digitalization. This slightly contradicting picture could be an indicator for high uncertainty within the group of LOOROs. It seems that they are unaware of which resources are necessary and what tools are helpful toward being well-equipped for the challenges of digitalization.

3) Internal Factors / Response: With regard to the influence of current use on the use of subsequent digitalization segments, not all hypotheses are confirmed. However, the results of the statistical analysis show that prior use of digitalization has a positive influence on the current use of digitalization in related business areas. And in the sequence of segments' analysis, each previous digitalization segment has a positive influence on its successor. Regarding the question of drivers or barriers, the digital administration segment, which has the highest load/weight, is still within a level of rather moderate use. Forty-eight percent (addition of very frequently and frequently use) of the surveyed LOOROs use the Internet

for purchasing. Fifty-eight percent of the respondents already use administrative software in their business and 56% use an inventory management system. Hence, the use of digital administration is rather neutral for the digitalization process of LOOROs (mean: 54%). The use of digital marketing is on a low to moderate level; 22% (addition of very frequently and frequently use) use online advertising, 9% use marketing support software and 32% use digital communication channels. The rather low use of marketing acts as a weak barrier on the technology adoption and innovation process of LOOROs (mean: 21%). The use of digital sales channels is considered a strong barrier (mean: 8%): 13% of the LOOROs have their own online shop (CS1), 9% are active on third party e-marketplaces (CS2) and only 2% of the participants use in-store applications (CS3) in their shops.

Concerning the second research question “What are potential starting points for LOOROs to grow into digitalization and get ready for the digital future?” our results reveal two promising starting points for the digitalization of LOOROs. 1) The use of digital administration in the back-end. With regard to the descriptive results, it is the area with the highest use intentions and with the highest current use. The digitalization of the back-end is not a barrier for the adoption process, and therefore LOOROs will be more open to starting their digital development here. Furthermore, our analysis shows that the use of digital administration has an impact on all subsequent digitalization areas (Digital Marketing => Digital Sales Channels => Digital Services). Therefore, the digitalization of administration should be a promising initial impulse and start a chain reaction towards the use of digitalization in all areas. 2) The use of digital Marketing. Compared to the remaining segments, this segment comprised (Digital Sales Channels, Digital Services) higher intentions and it is only the low current use that blocks the digitalization of LOOROs. However, the use of tools and applications for digital marketing has a positive impact on both subsequent segments (Digital Sales Channels => Digital Services) and can thus be used as a multiplier of digitalization within LOOROs.

5.8 Conclusion

5.8.1 Summary

With the help of a survey conducted among 223 LOOROs in 26 cities of the region South Westphalia in Germany, this study sheds light on internal and external influence factors and their role in the technology adoption and innovation process of LOOROs. The aim was to derive possible trigger points to offer insights on how to motivate the resident LOOROs' to

push ahead with efforts to embark on a path of digital reform and subsequently to transfer the gained knowledge to other regions facing similar problems. Our results support the findings of prior research and indicate that LOOROs are still hesitant to adopt digital tools and applications, and they neglect opportunities that digitalization could offer for their business models (Pantano, 2014, p. 6; Navickas et al., 2015, p. 4; Bollweg et al., 2016, p. 13). We conclude by conveying the essence of our findings: Despite all barriers, digitalization of back-end activities can be a suitable starting point and trigger for all subsequent business areas of the South Westphalian LOOROs. The use of tools and applications for digital marketing also offers promising perspectives towards digital development. However, it seems unlikely that suspended business types like LOOROs can independently overcome their manifold barriers to recover. LOOROs depend on external support to adapt to the digital development of their competitors as well as their customers (Kurnia et al., 2015, p. 1907). Since competition in the retail sector is getting more intense, and industry imbalances in terms of market centralization are already visible in the e-commerce sector (Grewal et al., 2017, pp. 4-5), the public sector and politicians who want to save the city center infrastructures need to create sufficient support structures for LOOROs (Kurnia et al., 2015, p. 1907; Salamon and Elliot, 2002, pp. 1-47).

5.8.2 Research Implications

This study has several theoretical implications. Firstly, we contribute to the technology adoption research by means of an examination of the internal and external influence factors of the technology adoption process of Micro Enterprises (like LOOROs) with an adapted and improved S-O-R-Model. The new model includes an improved organism (O) section (by integration of the TRA / TPB core constructs) as well as an extended response (R) section and a usage-related examination. It offers a toolbox for future research on micro enterprises of all kinds. Secondly, the subdivision of the analysis model into four digital business areas (Digital Administration, Digital Marketing, Digital Sales Channels and Digital Services) offers a systemized approach to frame the ambiguity of the umbrella term digitalization into an operational understanding. Future work can build upon these two extensions to better understand the organization and response dimension of the S-O-R-Model.

5.8.3 Managerial Implications

Besides examination of the drivers and barriers of the digitalization of South Westphalian LOOROs, our findings provide insights for the owners and managers of LOOROs in other regions as well as for the public sector on how to promote LOOROs' technology adoption and innovation process.

For the owner / managers of LOOROs, this study reveals the following insights: 1) LOOROs seem to be decoupled from their environment. They rarely perceive any pressure towards digitalization from their customers who have already adapted to the digital age and are used to digital sales channels and digital services (Müller-Seitz et al., 2009, pp. 37-38). To recouple LOOROs to their environmental developments, the owner / manager has to work on his perception and awareness of the needs and expectations of current and potential (and maybe already lost) customers. 2) LOOROs neglect opportunities of the digital sales channels and are subsequently inexperienced with the tools and applications of digitalization. To experience the digital world with a quick sense of achievement, LOOROs should start using easy access online sales channels like third-party platforms (also local shopping platforms) to explore new markets and to get started in the e-commerce arena. Once motivated to use the tools of the digitalization, LOOROs will start and explore the all opportunities of all subsequent business areas, too. 3) Due to the limitations in terms of the lack of available resources, LOOROs need to implement digital tools and applications to manage the available assets more efficiently. It may make sense for LOOROs to seek for synergy effects along the value chain. Cooperation with suppliers and co-creation could help to overcome the current limitations of employees (Korsgaard et al., 2015, pp. 5-11; Andreu et al., 2010, pp. 246-249; Greer and Lei, 2012, p. 70). Furthermore, LOOROs should also seek cooperation with competitors to be able to offer more digital services (Grewal et al., 2017, p. 4-5). While most of the digitally advanced competitors build on an extended infrastructure and logistics network in the background, LOOROs will have to use integrated software and marketing automation tools to build a basis for a holistic and effective digitalization strategy that will help them overcome their limitations (lack of time, lack of human resources, etc.) (Bollweg et al., 2015, p. 3).

Furthermore, our results lead to the following recommendations for politicians and city managers who want to foster the digitalization of LOOROs: 1) LOOROs face a shortage of resources and it is unlikely that they will be able to overcome this barrier on their own (Kurnia et al., 2015, p. 1907). While LOOROs are responsible for seeking cooperation and support, the public sector should create forums and platforms for LOOROs to coordinate and

execute this cooperation (Osei et al., 2016, p. 421). An example could be the creation of support structures for local e-commerce activities and the digitalization of offline points of sale, such as local shopping platforms (Galbraith et al., 2017, p. 19). 2) The public sector needs to help LOOROs to gain a realistic perception of external pressures (like changing customer behavior or e-commerce growth rates in comparison to local retail growth rates). The public should take action e.g., with the help of awareness campaigns and special education programs for local retailers to reconnect them with their near environment (Tornatzky and Fleischer, 1990, pp. 177-195). 3) The public sectors should use LOOROs' openness for digital support of their administrative backend as a door opener. Today's integrative ERP systems and inventory management systems include broad functionality also for online shops and for customer relationship management (Kourouthanassis et al., 2007, pp. 319-330). If their implementation is facilitated financially and/or legally, they can be used to prepare and trigger digitalization in subsequent digitalization segments of LOOROs as well. 4) LOOROs need to gain experience with digitalization to overcome their wait and hold attitude (Erosa, 2009, p. 6). The public sector should offer LOOROs access to case studies and best practices (Toutain et al., 2017, pp. 876-882; Lindh and Thorgren, 2016, pp. 9-20). Furthermore, it would be helpful for LOOROs to participate in pilot projects to gain experience and develop the necessary skills to cope with the challenges of the digital age (Pantano and Vissaone, 2014, p. 3).

5.8.4 Limitations & Future Research

For the presented study, we see the following limitations: LOOROs are not easy to survey and although we collected data from 223 LOOROs in 26 cities, the rather small sample size limits the explanatory power of our findings. Moreover, digitalization is a highly dynamic process, making the identified current state of LOORO digitalization and the derived recommendations just a snapshot. The research model is based on the context of the German retail industry, where LOOROs have a high market share and are traditionally well-established and anchored in society. Therefore, the results may not be generalizable to other countries because of cultural differences. Furthermore, our model suffers from the same vulnerabilities as all TPB- or TAM-based models, namely that the relationship between behavioral intentions and behavior (current use) seems to be tautological. The information value of the construct "Current Use" as a proxy for the examination of the impacts of prior use is limited and should be extended. Finally, the expressed uncertainty stated in the descriptive results shows that LOOROs might not really know which resources are necessary

to be well-equipped for the challenges of digitalization. Hence, their stance towards resources and their expression of actual needs could change once they face digital challenges in their day-to-day business operations (Andreu et al., 2010, pp. 246-249; Geer and Lei, 2012, p. 71).

With regard to our findings, we suggest the following areas of future research: 1) Technology: Although, we had an intense look at tools from several business areas, research is needed to identify promising technologies and digital tools and applications that can help LOOROs improve their business and win back competitive power. 2) Technology Adoption: the examined external and internal factors do not cover all of the influences on LOOROs' decision-making, further studies should investigate what other factors may have impact on technology adoption and can be used as triggers to support LOOROs and SME retailers towards digitalization. 3) The public sector: LOOROs will need public support. Research is necessary on the question as to whether LOOROs are receptive to governmental assistance (subsidies or regulations). 4) Industry Standards: Several reviewed studies call for more industry standards, research should scrutinize if new and more industry standards are supportive for the retail sector to foster digitalization. 5) Services and Collaboration: Our findings show that LOOROs alone already found their limits; future research should determine possible services for cooperation and collaboration among LOOROs, suppliers and customers. What can LOOROs learn from related industries and different business models, e.g., malls? 6) Sales Channels: LOOROs face tough competition, but are reluctant to use digital sales channels. Research should point out what the promising digital sales channels for LOOROs are and what the potential of local e-marketplaces are, as well. Finally, 7) Education: LOOROs need to refresh their knowledge. Research is needed to find suitable learning forums (e.g., workspace learning, e-learning) to prepare LOOROs for the digital age.

6. Carrot-or-Stick: How to Trigger the Digitalization of Local Owner Operated Retail Outlets?

6.1 Publication Details

Abstract: Local Owner Operated Retail Outlets (LOOROs) are threatened in their very existence by the digitalization pressure from online and offline competitors on the one hand and by changing shopping habits of their customers on the other. Despite all digitally-enabled opportunities to regain competitive power, LOOROs still hesitate to adopt digital tools and applications. Politicians, city managers and retail lobbies seek for triggers to support the local structures and to push the digitalization efforts of local retailers. Building on Andreoni's "Carrot-and-Stick Approach", this study examines the impact of the availability of resources (carrot) and the perception of pressure (stick) on the use of digital applications among 223 owners of LOOROs from 26 cities in Germany. Our findings show that LOOROs are receptive for "Carrot-and-Stick". LOOROs seek for orientation while suffering under a shortage of time and capacities and seem to be disconnected from the development of their competitors and their customers.

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6.2 Introduction

In a growing market environment, local owner operated retail outlets (LOOROs) are pressured to adapt their own business models to the intense competitive situation in the retail sector. LOOROs, which are characterized by a small-sized store area, a limited number of staff and high owner-involvement in the day-to-day business operations, are challenged by the industry transformation (Bollweg et al., 2015, p. 8). In Germany, the market share of the business type LOORO has declined from 26% to 18.5% between the years 2003 and 2014 (HDE, 2016, p. 9). Additionally, several independent studies predict a decline in revenues of 30% in the next four years in Germany (IFH, 2015; HDE, 2017, pp. 3-14). Responsible for this development is on the one hand the online trade that challenges LOOROs with strong price and service competition, while, at the same time, former purely internet-based retailers have started expanding its operations by means of physical stores in city centers to conquer the last bastion of brick and mortar retail, the customers in the high streets. Moreover, big-box retail outlets and chain stores have started to digitalize their business models and offer multichannel sales and services to their local customers (Liebmann, 2013). Customers, on the other hand, have changed their buying habits: they are already used to online shopping and digital services so that their shopping frequency in city centers is declining (IFH, 2016, p. 38). To sum it up, pure online retailers, big-box retail outlets and chain stores as well as changing customer shopping habits and a decline in shoppers' frequencies in the high streets are threatening the very existence of LOOROs. However, LOOROs are not defenselessly exposed to the threats of the digital age. Digital tools and applications to handle administrative tasks (e.g., digital inventory management systems, customer relationship management systems and marketing tools) and to enable digital interaction with the customers across the sales channels (e.g., via online shops, e-marketplaces, in-store applications, digital shelf extensions) allow LOOROs to overcome their inherent limitations (e.g., lack of time, lack of knowledge, lack of human resources, lack of finance, etc.) and to regain competitive power (Navickas et al., 2015, p. 4). Despite all opportunities, studies show that LOOROs, like other small- and medium-sized enterprises (SME), still hesitate to adopt digital tools for their own business (Navickas et al., 2015, p. 4; Bollweg et al., 2016, p. 13).

The transformation of the retail sector and the slow but steady dying of the small, owner-operated retailers is not just a matter of the LOOROs themselves. Abandoned high streets and empty city centers are potential threats to the traditional infrastructures and might have a negative impact on related industries (gastronomy, tourism, and many more) as well as on

the local job markets. Therefore, politicians, city managers and the retail lobbies seek for triggers to support the local structures and to push the digitalization efforts of the local retailers in this uncertain phase of industry transformation. With regards to the Economic Theory of Regulations (ET), the government and the public sector use two types of measures to foster the desired development: 1) Subsidies including measures that add or improve access to resources for development (e.g., grants, loans, loan guarantees, vouchers, contracts, etc.) and 2) Regulations including measures that create pressure towards desired development (e.g., legal, economic and social regulations, public information, taxes, liability, etc.) (Salamon and Elliot, 2002, pp. 1-47; Migué, 1977, pp. 213-221). The application of this two-sided toolbox is called the “Government’s Carrot-and-Stick Approach” (i.e., Andreoni et al., 2002).

The purpose of this study is to examine the impact of subsidy (carrot: offering resources) and regulation (stick: creating pressure) based triggers to foster the use of digital tools and applications among LOOROs. Therefore, we want to understand:

RQ1: *Are LOOROs receptive for triggers based on resources (carrot) and pressure (stick)?*

And furthermore:

RQ2: *What are promising measures for a “Carrot-And-Stick” approach to foster the current use of digital tools and applications among LOOROs?*

To achieve meaningful results, we conducted a survey among 223 owners of LOOROs of 26 comparable cities (rural region and population below 100,000 inhabitants) in Germany. The results of this study offer insights for the public sector on how to promote the digitalization of LOOROs as well as insights for owners of LOOROs on promising starting points for their own digital development. Our results contribute to the body of knowledge on two levels: 1) insights on the effects of “Available Resources” (Carrot) and “Perceived Pressures” (Stick) on the intention to use and the current usage of digital tools and applications in the front-end and back-end activities of LOOROs and 2) insights on the orchestration of an efficient and effective “Carrot-And-Stick” approach.

The remainder of this paper is structured as follows: In section 6.3, we provide an overview about the related theory with regards to subsidies and regulations. In section 6.4, we develop a conceptual model based on the above-mentioned theories to address our research question. In section 6.5, we describe the survey conducted and provide the statistical analysis. Further, we discuss our findings in section 6.6 and point out research, managerial and political

implications in section 6.7. Finally, we conclude in section 6.8 in order to answer the initial research question, to highlight limitations and to point out future research opportunities.

6.3 Theoretical Background

This study is addressing an intensively discussed area: the implication of governmental and public interventions with regards to technology adoption among commercial industries. Beside politicians and citizens also economists support controversial viewpoints about the use of public resources and powers to improve the economic status of members of the public (private or corporations) e.g., Keynesianism vs. Monetarism. As this study does not aim to resolve this controversy neither to argue for one or the other, we draw the attention towards literature that explains subsidies (carrot) and regulations (stick) and exposes implications for the technology adoption.

The Economic Theory of Regulation regarded market failure as the motivating reason for enacting regulations. Once established, regulatory bodies were supposed to lessen or eliminate the inefficiencies engendered by the market failure (Peltzmann et al., 1989, pp. 4-5). The available measures for the government and the public sector to foster the desired development are divided into subsidies and regulations (Salamon and Elliot, 2002, pp. 1-47; Migué, 1977, pp. 213-221). Subsidies are state transfers to members of the public which are either in kind or of monetary nature. Regulations are considered as the employment of legal instruments for the implementation of social-economic policy objectives (Aktan and Dokuzcesmeler, 2016, p. 305). The counterpart to regulation is deregulation; it means the state's withdrawal of its legal powers to direct the economic conduct (e.g., pricing, market entry) of members of the public. A fully functional market is a pre-requisite for the successful implementation of deregulation (Peltzmann et al., 1989, pp. 4-5).

Existing IS research neglects the examination of impacts of subsidies (carrot) and regulations (stick) on the technology adoption at an industry and firm level. A structured literature search in the databases of ScienceDirect, EbscoHost and Google Scholar remained fruitless. Minor effects of governmental regulations are discussed in technology adoption models like the "Technology-Organization-Environment-Framework (TOE)" without differentiating the governmental toolbox into subsidies and regulations (e.g., Tornatzky and Fleischer, 1990). These models process governmental regulations as given parameters companies are required to comply with (Petrova and Wang, 2013, p. 2; Rahayu and Day, 2015, pp. 143-146). However, extensive research on subsidies and regulations is done at an industry-level in

highly regulated markets (e.g., renewable energy and agriculture) (e.g., Kalkuhl et al., 2013, Latruffe et al., 2013). For the research on highly regulated markets, we discovered two main examination areas: 1) impact of subsidies and regulations on consumer prices and 2) the impact on industry growth. None of the reviewed literature was related to the impacts of governmental triggered technology adoption among economic groups at the firm level. The lack of research in this direction might be attributable to the favorable market conditions in the retail sector over the past decades. Nowadays, the retail market is jeopardized because of the challenges of the digital age and is failing due to financial and technological imbalances (Liebmann, 2013, IFH, 2016, p. 38). The existence of market failure is often the reason that self-regulatory organizations and governments intervene in a particular market (Tornatzky and Fleischer, 1990, pp. 177-195). Therefore, the government and the public sector are seeking triggers to lessen the imbalances of the market; this research takes a step towards identifying these triggers.

6.4 Conceptual Model & Research Framework

To support current public efforts and which in turn foster LOOROs and their current state of digitalization, this study aims to examine the possible external triggers of the governmental “carrot-and-stick approach” to push the use of digital tools and applications among LOOROs. Therefore, we examine whether and how “available resources” (carrot) and “perceived pressures” (stick) influence the owners of local retail outlets to use digital technologies. To frame the ambiguity of the umbrella term digitalization into an operational understanding, we structure the digital tools and applications based on the operational view of the management process of business models: 1) The digitalization of the front-end sales channels where we collect all digitalization efforts with direct customer touch points, and 2) the digitalization of the administrative back-end, invisible to the customer (Enders and Jelassi, 2000, pp. 544-546).

LOOROs are in fact micro-enterprises where owners are intensively involved in the day-to-day operations and which have to handle a structural shortage of internal and external resources (Bollweg et al., 2016, p. 13). Due to these characteristics, common small, medium and large enterprise-related technology adoption approaches (e.g., the Technology-Organization-Environment Framework (TOE), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Combined TAM and TPB, TAM2, Diffusion of Innovations Theory, and many more) are not suitable (Ramdani and Kawalek, 2007, pp. 412-

413). In large firms decisions are subject to collective, collaborating scrutiny and testing, and are influenced by others to a much higher degree than in micro-enterprises. In LOOROs the owner is the executive manager, salesman, and storekeeper in personal union. Hence, the owner-managers of LOOROs are the company's key decision makers who are in turn rather influenced by external factors than by internal structures (Lieberman-Yaconi, 2010, p. 80). To meet these characteristics this study will exclude the impacts of the organizational level from the research model and focuses on an owner-centric examination based on the individual level of the owner's personal characteristics.

The framework of the model is built on the S-O-R Model. The origin of the S-O-R Model lies in the field of environmental psychology. Mehrabian and Russel (1974) postulate that environmental stimuli (S) lead to emotional reactions of the organism (O) which finally drives behavioral response (R). To describe human perception of their encountered environments, the original S-O-R Model used three emotional dimensions: pleasure, arousal and dominance (the PAD-Scale). In the field of environmental psychology, pleasure, arousal and dominance are conceived as three basic dimensions of emotional responses that indicate peoples' state of feeling. Mehrabian and Russel (1974) described pleasure purely in terms of positive or negative feelings. Arousal is described as a feeling state that concerns mental activity and dominance as a feeling of control and behavior restrictions caused by physical or social barriers (Mehrabian and Russell, 1974, pp. 216-217)

In marketing research the S-O-R Model is usually used to examine the response of customers to a situational or environmental stimulus e.g., colors in a store environment or music while online shopping. Wang et al. (2011) used an S-O-R approach to examine how the two dimensions of web aesthetics, aesthetic formality and aesthetic appeal influence online consumers' psychological reactions. Moreover, Lee and Widdows (2011) applied an S-O-R based model to investigate how high-technology attributes influence consumer responses. By means of S-O-R Zhang et al. (2014) examined the motivation of customers to participate in social commerce and the impact of technological environments and virtual customer experience. Despite the contribution of the S-O-R framework to the research of consumer behavior, Kim et al. (2016) and other research papers point out that there is an issue with its PAD-Scale which measures consumers' emotional responses to environmental stimuli on bipolar continua. Several studies criticize the bipolar conceptualization for allowing the joint occurrence of pleasant and unpleasant states and propose a unipolar view as more suitable (Westbrook, 1987 p. 259; Russell and Carroll, 1999, pp. 25-26; Stangor et al., 2013, pp. 160-196). In an attempt to overcome this issue, the latest reviews of the "PAD-Scale" by Bakker

et al. (2014) had highlighted that the three dimensions of the PAD-Scale can be linked to one joint model of attitudes: pleasure, arousal and dominance can be respectively affective (feeling), cognitive (thinking) and conative (acting) responses. According to Bakker et al. (2014), the triad of feeling, thinking and acting can be unified as one joint measure for the organism (O) (Bakker et al., 2014, pp. 2-6).

This finding stands in line with the long history of information systems research about the use of technology in organizations. IS research has provided a broad range of theories with regard to technology adoption, acceptance and implementation, extent of usage, effectiveness, success as well as satisfaction (Ramdani and Kawalek, 2007, p. 414). Some of the perspectives are regarded as theories about diffusion of technology and discuss the adoption of technology through different channels (i.e., Rogers, 1995). Other perspectives focus on human behavior and its impact on the decision-making process towards the adoption and usage of technology (e.g., Ajzen, 1991; Davis et al., 1989). While related theories of technology diffusion are helpful to explain technology adoption outcomes on an organizational level behavioral theories contrarily focus on the individual analysis level where human behavior has its impact. The Theory of Reasoned Action (TRA) (i.e., Ajzen and Fishbein, 1977) and its successor the Theory of Planned Behavior (TPB) by Ajzen (1991) stated that attitudes, control beliefs and subjective norms influence behavioral intention, what in turn influences the actual behavior. Davis et al. (1989) applied TRA / TPB to the individual level of technology adoption behavior in his well-known “Technology Adoption Model (TAM)”. According to Davis, two key constructs influence an individual’s intention to use a technology namely the “Perceived Usefulness” and “Perceived Ease of Use”. Over the last two decades researchers extended this view, examined antecedent as well as moderating factors and incorporated alternative belief factors into their research models like the TAM2 or the UTAUT Model while keeping the core structures (behavioral intention influences actual behavior). Furthermore, researchers used the TRA / TPB as core framework and integrated theory of related disciplines. Koufaris (2002) used constructs from information systems (TAM), marketing (Consumer Behavior), and psychology (Flow and Environmental Psychology) in an integrated theoretical framework of online consumer behavior to examine how emotional and cognitive responses to visiting a Web-based store for the first time can influence online consumers’ intention to return (Koufaris, 2002, pp. 206-213).

Accordingly, we build our research framework on the S-O-R framework and extend its organism (O) section with the integration of the core constructs of TRA, TPB and TAM, namely “attitude”, “behavioral intention” and “actual behavior”.

Stimulus (S): Despite the growing competition from the online trade, digitalized advanced big box retail outlets and chain stores as well as changing customer habits towards digital channels LOOROs still hesitate to use digital tools and applications to regain competitive power (Navickas et al., 2015, p. 4; Bollweg et al., 2016, p. 13). To support LOOROs, politicians, city managers and the retail lobbies seek for triggers to push the digitalization efforts of the local retailers. The toolbox of the public sector comprises two types of measures to promote the desired development: 1) Subsidies (adding resources) and 2) Regulations (creating pressure) (Salamon and Elliot, 2002, pp. 1-47): the “Government’s Carrot-and-Stick Approach” (i.e., Andreoni et al., 2002). The prospects of success of the applicable measures (adding resources or creating pressure) are related to the state of the availability of resources and the perception of pressure among the aimed target group. In detail, a state of high available resources and a low perception of pressure would have a lower impact on the prospects of success. Vice versa, a state of low available resources and a high perception of pressures would be promising for the prospects of success of the applied measures (Salamon and Elliot, 2002, pp. 1-47).

To examine the potential effectiveness of the discussed measures, this study investigates the current availability of resources and the perception of pressures among LOOROs as well as their impact on the usage of digital tools and applications. Mehrabian and Russel (1974) state that environmental stimuli (S) lead to emotional reaction of the organism (O). The perception of the availability of resources and the perception of external pressures can be both seen as comparable environmental stimuli that lead to comparable emotional reactions of the organism. According to Bakker et al. (2014), we will link the commonly used PAD-Scale in the organism (O) block to a joint model of attitudes to avoid the joint occurrence of pleasant and unpleasant states.

Our measurement of the “Available Resources” is based on the resource categories of the Resource-Based View. These categories are representing tangible and intangible goods and can be translated into the availability of financial resources (R1), the availability of the necessary capacities (R2), the availability of the needed knowledge (R3) and the availability of time (R4) (Wernerfelt, 1984, p. 173). To investigate the influence of available resources on the emotional reactions of the organism (O) block of the research model, we hypothesize:

H1: The availability of resources has a positive influence on the attitude towards the digitalization.

Regarding the effectiveness of measures that use pressure to foster digital developments among LOOROs, this study also investigates the current state of the perception of external pressures and their influence on the organism (O) of the research model. Our measurement of the “Perceived Pressure” is derived from the “Three-Environment Theory” (Stapleton, 2000, p. 28). Correspondingly, external pressures comprise influences from the near and far environment. As described in the Three-Environment Theory, the near (specific) environment is formed by influences of competitors (EP1 – competitive pressure), customers (EP2 - customer pressure) and suppliers who exert a direct impact on the examined organization. The far (general) environment is formed by influences of politics (EP3 – legal pressure), society (EP4 – society pressure), technological and economic pressures (Stapleton, 2000, p. 28). With respect to the discussed background we are mainly covering the economic pressure with the investigation of the financial resources but we neglect the suppliers’ pressure (based on offer and demand) and the technological pressure (push and pull) due to our research scope of potential triggers for the public sector. Accordingly, we hypothesize:

H2: Perceived pressure towards digitalization has a positive influence on the attitude towards the digitalization.

Organism (O): In the traditional S-O-R models the (O) is represented by the PAD-Scale and its measure of pleasure, arousal and dominance. Despite the undoubted contributions of the S-O-R model for consumer research, the PAD-Scale itself is questionable (Bakker et al., 2014, pp. 2-6). To address the criticism about the bipolar conceptualization, namely the joint occurrence of pleasant and unpleasant states in the PAD-Scale (Kim et al., 2016, pp. 1-2; Westbrook, 1987, p. 259), this study integrates the core blocks of the established TRA/TPB theory that derives from the well-known Technology Acceptance Model (TAM). In contrast to the suggested triade of feeling, thinking, and acting by Bakker et al. (2014), TRA/TPB theory separates the internal state of acting (behavior) from the measurement of the attitude (feeling and thinking). TRA/TPB theory states that attitudes, control beliefs and subjective norms do not directly influence actual behavior. Furthermore, it states that attitudes influence the behavioral intention (intention to use) which in turn influences the actual behavior (current use) (Ajzen, 1991, p. 182; Davis et al., 1989, p. 984).

Our joint measurement of the attitude towards digitalization is based on TRA / TPB theory. The feeling is represented by the measurement of the subjective norm towards digitalization (A1) and the ease of use (A2). The thinking is covered by the expected future developments

(A3) and the expected effectiveness of the digitalization (A4) (Ajzen, 1991, pp. 181-182; Davis et al., 1989, p. 984). According to the introduced relationships of the TRA/TPB theory we state the following hypotheses for both of our examination areas (front-end and back-end):

H3a: *A positive attitude towards digitalization has a positive influence on the intention to use digital sales channels (front-end).*

H3b: *A positive attitude towards digitalization has a positive influence on the intention to use the digital tools in the administration (back-end).*

Our measurement (behavioral) intention to use digitalization in both examination areas (front-end and back-end activities) is based on the operational view of the management process of business models for brick and mortar retail stores (Enders and Jelassi, 2000, pp. 544-546). For the front-end (intention to use digital sales channels), it covers the possible online and offline sales channels such as an own online shop (IS1), the presence on third-party e-marketplaces (IS2) and the use of in-store applications (IS3) as well as the online marketing activities (IS4) (Enders and Jelassi, 2000, pp. 544-546).

Our measurement for the back-end (intention to use digital tools and applications in the administration) covers all digital support activities with no direct customer touch points (Enders and Jelassi, 2000, pp. 544-546). As there are: the use of soft-ware for administration (IA1), the use of inventory management systems (IA2), the use of digital communication channels (IA3) and the use of digital payment systems (IA4).

According to TRA/TPB theory attitudes influence the behavioral intentions what in turn influences the actual behavior, we consequently state the following hypotheses (Ajzen, 1991, pp. 181-182; Davis et al., 1989, p. 984):

H4a: *A high intention to use digital sales channels has a positive influence on the current use of digital sales channels.*

H4b: *A high intention to use the digital tools in the administration has a positive influence on the current use of the digital tools in the administration.*

Response (R): The usage of digitalization either in front-end or back-end activities is measured as indirect response to the examined stimuli, “Available Resources” and “Perceived Pressures”. It is the last step in the already introduced chain of relationships, stated by the TRA/TPB theory (Ajzen, 1991, p. 182; Davis et al., 1989, p. 984). Our last measurement of the current use of digitalization for both examination areas shares the same

theoretical structure with the intentional constructs (Enders and Jelassi, 2000, pp. 544-546). Instead of behavioral intentions we examine the actual behavior. For the “Current Use of digital Sales Channels” we cover the already introduced possible online and offline sales channels: online shop (US1), third-party e-marketplaces (US2), in-store applications (US3) and online advertisement (US4). For the “Current Use of digital Administration” we cover the back-end activities of the LOOROs namely the use of software for administration (UA1), the use of inventory management System (UA2), the use of digital communication channels (UA3) and the use of digital payment systems (UA4).

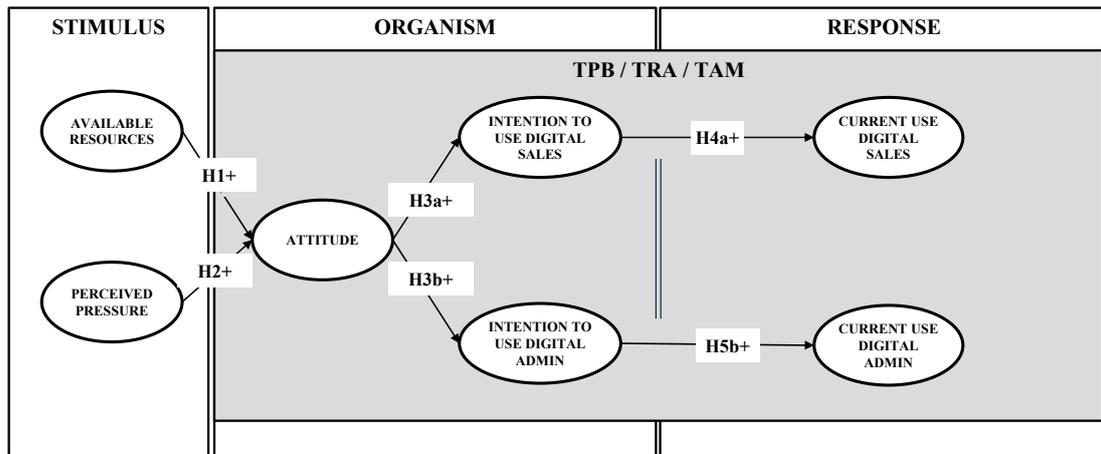


Figure 6.1 Research model

6.5 Analysis

6.5.1 Data Collection

As part of the research project “Future Lab Retail South Westphalia 2020” we conducted a survey among LOOROs (May and July 2016) of the 26 partner cities of the region of South Westphalia in Germany. The questionnaire contained 42 questions with a 5-point-Likert-Scale and was answered by 124 participants via an online form and by 119 participants on paper. In total 243 questionnaires were submitted with 223 full data sets. For the analysis of the collected data and the evaluation of the research model we used SmartPLS (i.e., Ringle et al., 2005). Bootstrapping was done with 5000 samples and 223 cases, determining the significance of weights, loadings and path coefficients. SPSS was used for the multicollinearity tests of the formative constructs.

6.5.2 Measurement Model

The research model has one reflective construct (“Attitude towards Digitalization”). The other six constructs are formative so that different analyses are needed (Fornell and Bookstein, 1982, p. 442). The significance of the constructs’ indicators is assessed by their loadings (reflective constructs) that should be greater than 0.7 (greater than 0.6 is acceptable) or weights (formative constructs) that should be greater than 0.1 (Jarvis et al., 2003, p. 200-205) and their t-values. An indicator is significant if its t-value is greater than 1.65. This corresponds to a significance level of 10%. In order to reach a significance level of 5% (1%), the t-value must be greater than 1.96 (2.57) (Hair et al., 2006, pp. 664-670). Table 6.1 shows the t-values as well as the corresponding loadings / weights for all indicators of our model and also indicates the result with regards to the calculated significance. Concerning the reflective construct, all indicators are significant. The AVE (Average Variance Extracted) is 0.5750 (minimum > 0.5) and the composite reliability is 0.8428 (min. 0.7) so that the model fits to the convergence criteria. The discriminant validity of the constructs is also given. The model complies with the Fornell-Larcker criterion: Its highest squared construct correlation is with 0.3 below the maximum of 0.5 and the loadings of the reflective indicators are significantly higher than their cross loadings as compared to the other constructs. The internal consistency is given as the reflective construct exceeds the critical value of 0.7 for Cronbach’s Alpha. Attitude towards Digitalization: 0.7515 (Hair et al., 2006, pp. 664-670). The prediction validity Q2 is with 0.4323 higher than the minimum of 0 (Hair et al., 2014, 102-103).

The results of the formative constructs are as follows: For the construct "Available Resources", two (R2, R4) of the six indicators have significant positive influences. The construct "Perceived External Pressure" includes three of four significant indicators: EP2, EP3 and EP4. The construct “Intention to Use Digital Sales Channels” comprises two of four significant indicators: IS2, IS3. For the construct “Intention to Use Digital Administration” three of four indicators have significant positive influences (IA2, IA3, and IA4). The construct “Current Use of Digital Sales Channel” includes three of four significant indicators: US2, US3 and US4. And finally, for the construct “Current Use of Digital Administration” three of four indicators are significant: UA2, UA3, UA4 (see Table 6.1). In addition to the significance of indicators, the discriminant validity of the formative constructs must be verified. The highest correlation between the latent variables is given for the constructs "Intention to Use Digital Sales Channels" and "Current Use of Digital Sales Channels" with a value of 0.8995. This does not exceed the set maximum of 0.9 so that the

criterion regarding the discriminant validity is met (Hair et al., 2014, pp. 102-103). The analysis conducted using SPSS with regard to multicollinearity showed that all indicators of the models are sufficiently different and independent of each other (Hair et al., 2014, p. 125).

ns = not significant; *p<0.10; **p<0.05; ***p<0.01.

Indicator	Loading / Weight	t-statistics	Significance	VIF	R ²
R1	0.0104	0.089	ns		
R2	0.8274	9.6099	***		
R3	-0.0342	0.2392	ns	-	-
R4	0.4094	2.4363	**		
EP1	-0.0634	0.4512	ns		
EP2	0.3257	2.2084	**		
EP3	-0.573	3.8501	***	-	-
EP4	0.7678	6.7553	***		
A1	0.8284	31.6562	***		
A2	0.7428	17.973	***		
A3	0.6412	10.046	***	1.64	0.398
A4	0.8114	9.3633	***		
IS1	0.0771	0.85	ns		
IS2	0.3918	2.4835	**		
IS3	0.6875	4.8411	***	-	0.067
IS4	0.0153	0.1447	ns		
IA1	0.5818	5.5666	***		
IA2	0.3082	1.831	*		
IA3	0.0734	0.8627	ns	-	0.111
IA4	0.4783	3.1103	***		
US1	0.0606	0.6482	ns		
US2	0.3614	2.2645	**		
US3	0.7284	5.3362	***	-	0.809
US4	-0.0193	0.2012	ns		
UA1	0.5358	4.8738	***		
UA2	0.331	1.9906	**		
UA3	0.1082	1.266	ns	-	0.770
UA4	0.4949	3.2791	***		

Table 6.1 Path coefficient

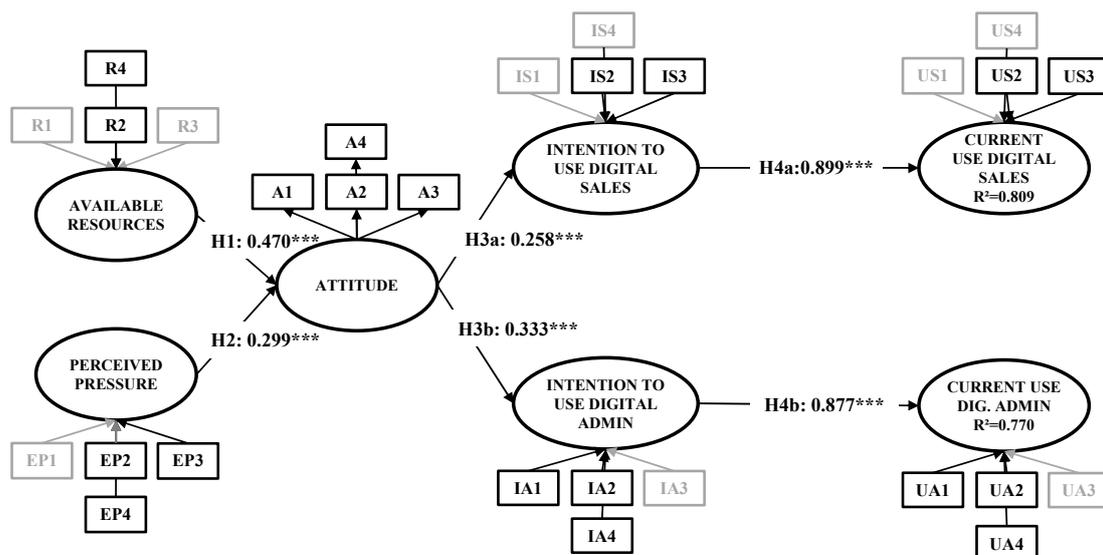


Figure 6.2 Research model & analysis

6.5.3 Structural Model

In order to validate the model, the constructs with two or more influencing factors (only Attitude) were assessed using the variance inflation factor ($VIF=1/(1-R^2)$) as to potential multicollinearity (Weiber and Mühlhaus, 2010, p. 207). The VIF of “Attitude” (1.64) is lower than the required level of 5 and stays even below 3.333 which shows that there is no multicollinearity (Diamantopoulos and Siguaaw, 2006, pp. 271-272). The value of R^2 represents the coefficient of determination which indicates a substantial influence if the value exceeds 0.67. A value higher than 0.33 implies that a moderate influence of a latent independent variable on the dependent latent variable can be assumed. A weak influence is indicated by an R^2 value of higher than 0.19 (Van der Heijden et al., 2003, p. 44). The coefficients of determination of the endogen constructs are all substantial: “Current Use of Digital Sales Channels” $R^2=0.809$, “Current Use of Digital Administration” $R^2=0.770$. The t-values depicted in Table 6.1 and their path coefficients allow conclusions as to the validity of the formulated hypotheses. In sum, all stated hypotheses are highly significant (***) - $p < 0.01$). The results of the hypotheses are as follows: H1, “Available Resources” has a positive influence on the “Attitude towards digitalization” (H1- effect size $f^2=0.34$; effect size scale: $>0.02 = \text{low}$, $>0.15 = \text{medium}$, $>0.35 = \text{high}$). H2, “Perceived Pressure” has a positive influence on the “Attitude towards digitalization” (H2- effect size $f^2=0.13$). H3a, a positive “Attitude towards Digitalization” has a positive influence on the “Intention to Use Digital Sales Channels” (The effect size of 3a,b and 4a,b are not computable due to the model design). H3a, a positive “Attitude towards Digitalization” has a positive influence on the “Intention to Use Digital Administration”. H4a, a high “Intention to Use Digital Sales Channels” has a positive influence on the “Current Use of Digital Sales Channels”. H4b, a high “Intention to Use Digital Administration” has a positive influence on the “Current Use of Digital Administration”. Figure 6.2 shows all significant relations with a t-value of at least 1.65 (Fornell and Bookstein, 1982, pp. 444-445).

6.6 Discussion

With the help of a survey conducted among 223 LOOROs in 26 cities in Germany, this study sheds light on the internal states of the owners of LOOROs and on the impacts of possible external triggers (Subsidies: offering resources, Regulations: creating pressure) on the current usage of digital tools and applications. To answer our first research questions: all stated hypotheses are confirmed and our findings show that LOOROs are receptive for the

“Carrot-and-Stick Approach”. LOOROs suffer from a shortage of resources and perceive pressure from their environment. With low resources and a high perception of pressure the prospects of success of a “Carrot-and-Stick Approach” are promising (Salamon and Elliot, 2002, pp. 1-47). Both subsidies (adding resources) and regulations (creating pressure) will have impact on LOOROs digitalization efforts.

Going into further detail, in terms of resources, LOOROs face a shortage but they also face a situation of uncertainty. It appears that they do not know whether own resources are sufficient or not. All examined indicators (R1-R4) are characterized by high numbers of undecided answers (between 30% - 43%). Surprisingly only 24.4% (addition of disagree and strongly disagree of the descriptive results) do not see the ability to invest into digital tools and applications. This is in line with the results of the statistical analysis. Financial resources (R1) as well as knowledge resources (R3) are not significant indicators. However, the significant indicators (capacities (R2), time (R4)) show that resources which help to overcome LOOROs’ operational limitations have an impact on the digitalization efforts. Furthermore, LOOROs perceive only low pressure to digitalize from their near environment. The indicator “competitive pressure” (EP1) is not significant and the perception of customer pressure towards digitalization (EP2 - 11.2% - addition of agree and strongly agree of the descriptive results) is almost imperceptible. However, LOOROs do perceive pressure from the far environment e.g., legal regulations (EP3 - 54.3%) and a general pressure from the society (EP4 - 56%). With regards to our results, LOOROs seem to be disconnected from their near environment, what leads to erroneous self-assessments and to the risk that the services provided by the LOOROs may not correspond to the competitive environment and the customer expectations (Bollweg et al., 2015, p. 7; Bollweg et al., 2016, p. 13).

Nevertheless, the owners of LOOROs have a positive attitude towards digitalization, nearly 60% (addition of strongly agree and agree) think that “digitalization is good” (A1) and “easy to learn” (A2). 84% think that digitalization will “play an important role in the future” (A3) and 52% think that the digitalization will “increase their effectiveness” (A4) (all indicators are significant). However, our findings for the intention to use and the current use of digitalization show a contradicting picture: LOOROs still hesitate to adopt digital technologies and communicate only a low intention to do so in the future.

With regards to usage of digital tools and application on the sales channels, LOOROs report on low usage intentions for the significant indicators, just 12.6% (strongly agree and agree) have the intention to sell on third-party e-marketplaces (IS2). Referring to the lower boundary, only 8% have the intention to use in-store applications (IS3). For the not

significant indicators, only 28% of the owners of LOOROs indicate the intention to use an own online shop (IS1), but surprisingly, nearly 41% state to use online advertisement in the future (IS4). The low intentions and the significance of the indicators are in line with our findings about the current usage: just 9% (very frequently and frequently) make use of third-party e-marketplaces (US2) to sell their products. The lowest point with 2.3% was reported for the use of in-store applications (US3) in the sales area. Finally only 13% of LOOROs use an own online shop (US1) and the highest current usage for the sales channels was reported with 22.4% for online advertisement (US4). It is uncertain whether LOOROs seem not to see the opportunities of the digital sales channels or if they consider themselves as not being able to implement digital tools and application and to run them successfully?

With respect to the use of digital tools and applications for the administration LOOROs demonstrate slightly stronger intentions. 59% of owners of LOOROs (strongly agree and agree) intend to use administrative software (IA1). 62% have the intention to use inventory management systems (IA2). And 41% seek to use digital payment systems (IA4). Referring to the current usage, our results show that 58.3% (very frequently and frequently) of owners of LOORO use software for the administration (UA1) and 56.1% use digital inventory management systems (UA2). The lowest usage is reported with 35% for the use of digital payment systems (UA4). The indicators “intention to use” and “current use” of digital communication system (IA3 & UA3) are not significant.

In general the results show a higher tendency of LOOROs to use digital tools and applications for the administration to support their back-end activities than on the front-end sales channels with direct customer touch points. It appears that LOOROs are more open to digital solutions that support their day-to-day business, where they can feel the benefit (pace of work, convenience) right away than implementing digital tools and applications with customer touch points which seems to be more personally distanced and probably requires extra efforts in terms of customer care (Bollweg et al., 2015, p. 8; Navickas et al., 2015, p. 4).

6.7 Implications

Managerial Implications: Beside the examination of the carrot-and-stick approach our findings are providing insights for the owners of LOOROs: 1) Digital Strategy: The high numbers of uncertain answers in the conducted survey show that LOOROs need orientation and have a lack of strategy. The owners need to overcome this uncertainty with the

development of digital strategies and an extended business model, ready for the digital age (IFH, 2016, p. 38). 2) Start with the back-end: Our results show a higher tendency for LOOROs to use digital tools and applications among the administrative back-end (e.g., software for the administration, inventory management systems). LOOROs should use their preference as a starting point; a strong digital infrastructure with integrated channels will empower all digital applications among the sales channels, too (Navickas et al., 2015, p. 3). 3) Collaboration: To break the vicious circle of limitations in terms of capacities and time, LOOROs should search for collaborations among local partners and competitors. Shared digital services (e.g., customer app, delivery) and shared infrastructures (e.g., local shopping platforms) without the hassle of own organized implementation and maintenance are promising (IFH, 2016, p. 38; Navickas et al., 2015, p. 4). However, it is a vicious circle and may sound contradicting; the implementation of the suggested measures is time and effort consuming and will not pay off until an intense implementation- and training phase has been completed (Kurnia et al., 2015, p. 1907).

Political Implications: We conclude our study with the answer on our second research question: What are promising measures for a “Carrot-And-Stick” approach to foster the current use of digital tools and applications among LOOROs? Despite their undoubted importance, our findings show that it is not expedient to offer financial or educational incentives for a target group that suffers considerably under a shortage of time and capacities. Instead, the public sector should first develop local support structures that help LOOROs to overcome their operational limitations. Based on our findings, we suggest a carrot-and-stick approach on three levels: 1) Information & Sensitization: LOOROs need to be reconnected to their near environment (customers, competition); information and sensitization campaigns as part of the regulatory body (Peltzmann et al., 1989, pp. 58-59) about the digital developments in terms of tools and applications, industry standards (IFH, 2016, pp. 3-42) and customer needs and habits (Bollweg et al., 2015, p. 7) are necessary to ensure that services provided by the LOOROs correspond to the competitive environment and the customer expectations (Bollweg et al., 2015, p. 8; Bollweg et al., 2016, p. 13). 2) Collaboration & Support: LOOROs need help to overcome their limitations (time, capacities) to be enabled to digitalize the business. Funding for collaboration platforms and infrastructures (e.g., local shopping platform) as well as for shared services (e.g., implementation, maintenance support for online shops and inventory management systems) could encourage collaboration among industry partners and competitors (Navickas et al., 2015, p. 4; Aktan and Dokuzcesmeler, 2016, p. 305). 3) Legal Regulations: Finally LOOROs are receptive for legal regulations (Peltzmann et al., 1989, p. 1-59). Regulations can steer

LOOROs towards the use of digital tools and applications and reduce the administrative burden. Possible starting points could be legal requirements with regards to digital cashier systems (including inventory management and interfaces to online shops and third-party e-marketplaces) (Kurnia et al., 2015, p. 1907). Furthermore, the introduction of standards (e.g., for product data provided by suppliers, to enable measures like shared product data databases, which provide standardized text and pictures for LOOROs digital presence) is promising.

Research Implications: We have developed a new approach for an S-O-R Model which improves the organism (O) section through the integration of the TRA / TPB core constructs instead of the convention-ally used and often criticized bipolar PAD-Scale. This alternative S-O-R Model is particularly suitable for the analysis of technology adoption among organizations such as ME retailers and ME in general where decision making takes part on the individual-level.

6.8 Limitations & Future Outlook

Due to their high involvement in daily operations of their business, owners of LOOROs are a difficult target group for a survey-based examination. Although we collected data from 223 LOOROs in 26 cities, the rather small sample size limits the explanatory power of our findings. Furthermore, the expressed uncertainty stated in the descriptive results show that LOOROs might not really know what resources are necessary or helpful to be well equipped for the challenges of digitalization. Hence, their view point towards resources and their expression of their actual needs could change once they face the digital challenges in the day-to-day operations of their business.

With regard to the findings of this research we suggest the following areas of future research: 1) Possible services for cooperation and collaboration among LOOROs. 2) Potentials of regulations based on standards for the retail sector to foster the digitalization of LOOROs. 3) Potentials of local e-marketplaces as cooperation platforms for LOOROs. And 4) possible e-learning formats for further education for LOOROs.

Section III

Specialization Area

7. In-Store Customer Analytics – Metrics and Maturity Scenarios for the Collection of Physical In-Store Customer Data

7.1 Publication Details

Abstract: While collecting and analyzing customer data via the web browser (Web Analytics) is very common in online-retail, stationary retail outlets have so far tended to neglect to collect and assess data of customer visits to their stores (In-Store Customer Analytics) and have focused on analyzing transaction data instead. Yet for online retail, it is the analysis of pre-transaction customer data that has been the most influential tool for the further development and improvement of services, in particular the optimization of the landing page and conversion optimization. Thus, it can be assumed that the analysis of pre-transaction customer data offers a similar potential to improve services and conversion rates for stationary retail. This paper offers a systematic assessment of in-store customer analytics metrics based on an extensive literature review and furthermore provides a maturity assessment matrix for a number of key technologies that are available for in-store customer analytics.

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7.2 Introduction

Customer data analysis (Web Analytics) is an established practice for online-retail (Devaraj et al., 2002, p. 317). The customer data collected via the web browser is compared to the transaction data stored in the shopping system and thus the transactions are compared with the potential transactions (visitors to the website) in the so-called conversion rate. Web-Analytics is a method using the received browser data in order to improve the structure, the setup of the landing page, and the pricing as well as the offers of an online shop in such a way as to increase sales. This online analysis is an essential part of virtually all online platforms (Davenport et al., 2011, pp. 86-87). In contrast to this, customer data for in-store visits remains virtually uncharted territory (Germann et al., 2014, pp. 2-3). Even though strategies for analyzing visitor data have been developed and analyzed for decades (e.g., via manual counting, using test customers, using eye tracking or using modeling systems such as blueprinting) (e.g., Granbois, 1968; Babin and Darden, 1995; Naumann and Jackson, 1999; Bijmolt et al., 2010), (partly) automatized assessment and analysis of customer data (In-Store Customer Analytics) has not really become common practice. Instead, retailers and researchers continue to concentrate on analyzing transaction data and consequently neglect the opportunity to expand their analysis horizon to include in-store customer data that is not covered by the transactions (e.g., Bermann and Kesterson-Townes, 2012; Rajan and Suresh, 2015). One reason for this reluctance to engage in new analysis methods may be that retail is experiencing a major change, in which the search for new solutions is cost-intensive, error-prone and difficult to integrate into the existing infrastructure (Gagnon and Chu, 2005, pp. 13-14). A number of technologies is available for collecting and assessing in-store customer data, having different degrees of maturity though. What is missing, however, is a systematic evaluation of the basis for in-store customer data analytics that is not biased towards one particular technology. Thus, it is the aim of this paper to provide a systematic overview of the current state-of-the-art of In-Store-Customer Analytics based on a structured literature review, in order to answer the following research questions:

RQ1: *What kinds of technologies are available for the collection and analysis of in-store customer data?*

RQ2: *What type of customer metrics can be collected in-store?*

RQ3: *Which technologies provide which type of customer metrics analysis?*

This study provides an independent assessment of the different data collection technologies and then concentrates on the possible metrics analysis that can be derived from them. The

interface between in-store customer and in-store transaction data is deliberately not taken into account, in order to focus on in-store customer data. The paper has the following structure: After this short introduction, the first part of Section 7.3 looks at the classification of Web Analysis Metrics (as established by the Web Analytics Association (i.e., Burby and Brown, 2016)) in order to derive a classification for in-store customer metrics based on the Web Analytics categories. The second part of Section 7.3 then presents current research on customer data analytics based on a systematic literature analysis, and also lists and classifies all technologies available to date and their respective analysis range. Section 7.4 is a detailed discussion of the data collection technologies, looking at their individual technical development and assessing their performance potential. Section 7.6 selects a number of key metrics from the in-store customer metrics assessed earlier (7.5), in order to reduce the complexity in such a way as to be able to create a matrix to assess their maturity and thus provide a structured overview of the available data collection technologies and the metrics they can supply. Section 7.7 discusses the resulting implications of the maturity assessment for the practical implementation of in-store customer metrics, which is then concluded in Section 7.8 comprising some key recommendations and an outlook towards the future of in-store retailing.

7.3 Literature Review

The literature review provided here is divided into two sections. The first part looks at Web Analytics and the Web Analysis Metrics, in order to develop categories that make sense for a classification of in-store customer metrics. The second part is a structured literature review, based on the categories established in the first part, which are used for a systematic review of data collection technologies.

7.3.1 Web Analysis Metrics

While in-store customer data analytics is virtually uncharted territory, Web Analytics is very well established and classified correspondingly, existing metrics have been standardized and categorized (e.g., Tetzrow and Berendt, 2003; Gupta et al., 2013). The organization responsible for the classification, the Web Analytics Association (WAA) (i.e., Burby and Brown, 2016) publishes a collection of categorized Web Metrics with their definitions on their website. These are accepted as a global standard. The WAA distinguishes between two different types of metrics, 'Count' is a directly measured number (e.g., the number of visitors

to a website) and ‘Ratio’ is a derived metric that can be calculated via other metrics (e.g., the average time of a visit to an online shop). The 22 metrics listed by the WAA are classified into six categories, which can be transferred to our in-store customer metrics classification system to limited extent.

1. Building Block	2. Visit Characterization	3. Visitor Characterization	4. Engagement	5. Conversion	6. Miscellaneous
Page	Entry Page	New Visitor	Page Exit Ratio	Conversion	Hit
Page View	Landing Page	Returning Visitor	Single Page Visits	Conversion Rate	Impressions
Visits	Exit Page	Repeat Visitor	Bounce Rate		
Unique Visitor	Visit Duration	Visitor Referer	Page views per Visit		
Event	Referer	Visits per Visitor			
	Session Referer	Recency			
	Click-Through	Frequency			
	Click-Through-Rate				

Table 7.1 Web analytics categories and metrics (Burby and Brown 2016)

As the category Conversion is a cross-reference between customer data and transaction data, this will not be studied in this paper. The metrics of the category Miscellaneous cannot be transferred to the in-store situation and will therefore not be studied here either. From the remaining four web metrics categories, two in-store metric categories can be derived.

1. Location metrics of the category ‘Visit characterization’
2. And behavior metrics in the category ‘Engagement’.

The Web Analytics categories ‘Building Block’ and ‘Visitor Characterization’ show that the derived categories have to be expanded to a further dimension as to identification, as these categories contain individualized and person-specific location and behavioral metrics. For metrics such as ‘New, Returning or Repeat Visitor’ customer identification is needed, while metrics such as ‘Visit’ can be collected as long as one individual (but not identified) visitor can be tracked.

7.3.2 In-Store Customer Analysis-Metrics

The following systematic literature review, based on journal papers and conference proceedings of the years 2000 to 2016, aims to identify all available technologies and metrics for In-Store Customer Analytics. The search was based on the following keywords: Retail

Analytics, Traffic Analytics, Operations Analytics, Behavior Analytics, Customer Analytics, In-Store Analytics, Video-Analytics, In-Store Metrics, Shoppers Intelligence, Path Analysis, Traffic Analysis and Customer Counting. The databases browsed were EbscoHost, IEEE Xplore, Springer Link and Google Scholar. As the Google Scholar results tended to overlap with the results of the other databases, duplicates were eliminated. Furthermore, only journal publications and conference proceedings that were available via direct PDF download were selected. Overall, this search yielded a corpus of 284 papers. By analyzing the titles and the abstracts of these 284 papers, 42 relevant papers were identified. These were studied in detail and led to the identification of 18 core papers that are the basis for this literature review (Table 7.3).

	EBSCOHost	IEEE Xplore	Springer Link	Google Scholar
Total results 284	48	96	28	112
After analyzing title and abstract: 42	12	14	7	9
After detailed analysis: 18	1	6	4	7

Table 7.2 Literature selection

This search which was deliberately conducted without bias for specific technologies yielded papers on data analysis technologies, most of which did either not mention stationary retail, or only mention it as an additional application option. This indicates that researchers seemingly have not really dealt with the topic of In-Store Customer Analytics so far. The analysis of the technologies discussed in the literature yields two main categories for data collection. 1) Direct measuring technologies which are able to directly assess the customers and their actions and 2) proxy technologies which assess the customers and their actions via a proxy (by means of their shopping cart, their smartphone etc.).

The customer data collection of both categories (direct or proxy) can be measured on three different levels. 1) non-individualized (customer cannot be traced and recognized as returning customer), 2) individualized (customer can be traced and recognized as returning customer) and 3) identified (customer can be traced, can be recognized as returning customer and can be identified unambiguously).

In addition to the question how something is measured, the question what is measured can also be used for the classification, applying it as a metrics category for the comparison of the different technologies. The first type of technologies is designed to collect location metrics which can either be realized via a single location or via multiple location measuring points. While the single location data collection corresponds to an on/off signal, the data collected

via multiple locations allows for more complex analyses (e.g., path analyses, heat maps etc.). The second type of technologies measures more than just the physical movement of the customer (behavioral metrics).

No.	Author	Technology	Alternative	Metrics Categories	Customer Identification	In-Store Metrics
1.	Sorensen (2003)	RFID	RTLS	Multiple Locations	Proxy Individualized	Density, Speed of Purchasing, Quadrants, Speed of Shopping
2.	Hong et al. (2004)	WIFI	-	Multiple Locations	Proxy Individualized	-
3.	Li-Qun Xu (2007)	Video-Analysis (CCTV)	Optical Sensors	Multiple Locations, Action Event	Individualized	Crowd Density, Customer Counting
4.	Senior et al. (2007)	Video-Analysis (CCTV)	Infrared-Beams, Pressure Pads	Multiple Locations, Action Event	Individualized, Identified	Customer-Counting
5.	Bolliger (2008)	GSM, Bluetooth, WIFI	-	Multiple Locations	Proxy Individualized, Identified	-
6.	Yada (2009)	RFID	-	Multiple Locations	Proxy Individualized	Shopping Time, Staying Time in Sales Areas,
7.	Bourimi et al. (2011)	GSM, Bluetooth, WIFI	RFID, Indoor GPS, CCTV, Photo Sensors	Multiple Location	Proxy Individualized, Identified	-
8.	Blecker et al. (2011)	RFID	CCTV,	Multiple Locations, Action Event	Proxy Individualized	Visited Product Zones, Contact Instances, Physical Movement of Goods
9.	Rai et al. (2011)	Video-Analysis (CCTV)	WiFi, RFID	Multiple Locations	Proxy Individualized	Shopping Time, Staying Time in Sales Areas,
10.	Takai et al. (2012)	RFID	-	Multiple Locations	Proxy Individualized	Shopping Time, Staying Time in Sales Areas,
11.	Cai (2014)	WIFI	-	Multiple Locations	Proxy Individualized, Identified	-
12.	Conell et al. (2013)	Video-Analysis (CCTV)	-	Multiple Locations, Interaction Event	Individualized	People Counting, Conversion Rate, Buying Time and Staying Time, Cart Localization, Basket Size, Line Counting
13.	Rallapalli et al. (2014)	Smart Glasses	CCTV, WiFi	Multiple Locations, Interaction Event	Proxy Identified	Shopping Behavior: Walking, Dwelling, Gazing, Reaching out
14.	Yaeli et al. (2014)	WIFI	GPS, RFID, WiFi, Bluetooth	Multiple Locations	Proxy Identified	Store Zone, Store Visit, Zone Transition, Zone Visit Time, Store Visit, Unique / Repeat Customer, Store Exit Time, Store Enter Time, Time per Zone, Visitors to Store,

15.	Zeng et al. (2015)	WIFI	-	Multiple Locations	Proxy Identified	Walking Fast / Slow, Staying Time
16.	Deva et al. (2015)	WIFI	-	Multiple Locations	Proxy Identified	Returning Visitors, Visit Frequency, Visited Zones, Buying and Staying Time
17.	Pierdicca et al. (2015)	Beacon Technology	-	Multiple Locations	Proxy Individualized	Total Number of People, Avg. Visiting Time, People Passing by, Avg. Group Number, Interactions
18.	Pierdicca et al. (2015)	Video – Analysis (CCTV)	-	Multiple Locations, Interaction Event	Individualized	Visitors, Visitors of a Zone, Interaction with Shelf / with Person / with Products, Duration of Interactions, Avg. Interaction Time

Table 7.3 Literature review

The behavioral metrics can be further divided into two subtypes. The first subtype consists of the measuring of 1) individual actions such as walking, waiting, looking at, touching, while the second subtype includes the measuring of 2) interactions such as conversations with shop assistants (interactions with staff) or the lifting of products (product interaction). In order to assess and interpret the performance of each of the metrics categories identified, a collection and classification of specific metrics must be created, which is described and discussed in Section 7.5.

7.4 Technologies for the Collection of Physical Customer Data

There is a myriad of technologies available to the retail sector for collecting physical customer data. In our literature review, we identified eight different options, ranging from simple solutions such as infrared barriers to more complex systems, such as CCTV recording. In this paper, the merits of the different technologies are assessed independently. Potential cross-coordination of different customer data collection options and hybrid solutions will only be addressed in the outlook section of the conclusion. Table 7.4 below summarizes the performance range of each of these technologies with respect to the type of method (direct vs. proxy), the metrics categories that can be derived from these, and the degree of customer identification. In the following section the listed technologies will be assessed with regard to their advantages and disadvantages.

		Metrics category					
		Location metrics		Behavior metrics			
		Measurement	Single Location	Multiple Location	Action	Interaction	Customer identification
Sensors	Light Barriers	direct	yes	no	no	no	Not individualized
	Pressure pads	direct	yes	no	no	no	Not individualized
Proxy technologies	Optical sensors	direct	yes	no	no	no	individualized
	RFID	Proxy	yes	yes	yes	no	identified
	Beacon technologies	Proxy	yes	yes	yes	no	identified
	WIFI, GSM, Bluetooth	Proxy	yes	yes	yes	no	identified
Tracking systems	Smart Glasses	Proxy	yes	yes	yes	yes	identified
	CCTV	direct	yes	yes	yes	yes	identified

Table 7.4 Summary of In-Store Customer Analytics Technologies

7.4.1 Rudimentary Sensors

The use of pressure pads and light barriers for measuring customer data is the most rudimentary collection method for In-Store Customer Analytics. Advantages: Low cost. Disadvantages: By means of sensing the interruption of a light beam, or a certain weight, these simple solutions yield a rather number free of any reflection which in turn can be quite inaccurate due to the simple mechanism that generated it. Groups of people, shop employees, suppliers or contractors, children playing near the door or animals wandering around produce one hit. Hence, these technologies are unable to perceive shoppers as individualized entities. For this reason, light barriers and pressure pads are a good tool for registering general trends in higher or lower shopper numbers, but do not to yield a reliable number of shop visitors (Senior et al., 2007, p. 1).

7.4.2 Optical Sensors

The assortment of technologies that can be summarized under the heading ‘optical sensors’ ranges from motion sensors to infrared cameras. Advantages: optical sensor technologies of highest technical sophistication are able to follow visitors of a shop as individualized entities and analyze their behavior (e.g., path analysis, heat maps). As sensors are not able to identify visitors by name, there are no privacy issues. Disadvantages: Collecting data for groups of visitors tends to be a challenge for sensor systems and it should also be pointed out that these systems act independently of the customers and thus do not allow for an opt out (Xu, 2007, p. 11).

7.4.3 Proxy Technologies

The group of proxy technologies includes data collection via Wi-Fi networks, RFID chips, the use of smart glasses, or using smartphones with indoor GPS tracking. The performance range of the individual technologies is very diverse (Bolliger et al., 2009, pp. 3-4). Advantages: Due to the fact that these technologies allow for individual customer identification, the advantages mainly lie in the cross-referencing with transaction data and other customer data, which allows individualizing and customizing the shopping experience by means of digital services offers responding to detected customer behavior. Disadvantages: It is important to remember that the customer behavior is not directly measured, but is extrapolated using proxies, which means that misidentifications and other misrepresentations of customer behavior may occur. This can lead to information gaps, e.g., if the customer leaves the radar of the proxy such as the RFID identified shopping cart, does not carry a smartphone, or actually switched off the phone (e.g., Sorensen, 2003; Cai, 2014; Yaeli et al., 2014).

7.4.4 Tracking Systems

CCTV systems are the most complex group of technologies for collecting in-store customer data. As their development was initiated by the surveillance industry (Xu, 2007, p. 12), these video systems are able to count customers, follow and assess their shopping paths in store, and to collect their actions and interactions. Advantages: They can analyze groups and distinguish relevant data from irrelevant data (e.g., human visitors from animals). Facial recognition software, as well as the interpretation of gestures and facial expressions allows for an immense data depth and density that comes very close to the quality of direct staff-initiated observation (Pierdicca et al., 2015, pp. 3-4; Liciotti et al., 2014, pp. 5-7). Disadvantages: The use of CCTV recordings for customer data analysis has been criticized with regard to privacy reasons (e.g., Kenny et al., 2012; Connell et al., 2012).

7.5 In-Store Customer Analysis Metrics

In order to shift the focus from a technology-based view of obtaining in-store customer data, we would now like to focus on the type of data that can be obtained, since this is of greater relevance for shop owners: creating a classification of in-store customer metrics and their relevance. Metrics can be subdivided into four building blocks 1) the core metric that

provides the relevant data, thus being the central metric. The other parts are put as a prefix before the core metric, in order to further define it. These parts are 2) the individualization prefix, which allows to infer behavior of identified customers 3) the numbering prefix, which defines the type of measurement (frequency, time interval to last registration, duration), and the use of the measured figure which depends on the type of metrics (Count, Ratio or Count / Ratio), as well as 4) the relation prefix which associates the measured metric to the overall values measured on a time basis (average per day / month / year (see Table 7.5)). A core metric will necessarily include a counting prefix, while individualization and relational prefixing is optional. In order to reduce overall complexity, for the following analysis, we did not include all possible metrics variations, but looked at their core metrics only. Thus, the core metrics represent other metrics that can be derived from them, depending on the type of metric. In order to assess possible derivative metrics, we have created a metrics toolbox.

4*	3	2*	1
Relation prefix	Numbering prefix (type of metrics)	Individualization prefix	Core metric
Average / day	Number of (Count)	Unique	
Average / month	Frequency of (Count /Ratio)	New	
Average / year	Recency of (Count /Ratio)	Returning	e.g., Visitor (Count)
	Time per (Ratio)	Repeat	

Table 7.5 Example Average (4) Number (3) of Unique (2) Visitors (1) Metrics-toolbox * = optional

The entire collection contains 20 core metrics, identified in the literature review of the Web-Analytics Metrics, which represent a total of 1,248 variations of in-store customer analysis metrics. Table 7.6 lists the core metrics identified and links them to the respective metrics category, to the available technologies for collecting them, and to the type of customer data they provide. In the next section, the maturity assessment matrix for customer data is introduced which combines the different building blocks presented here, and provides an overview of the different technologies as well as the core metrics they can supply.

No.	Core metric	Metric category	Single Location	Multiple Location	Action	Inter-action	Type of customer data
1.	Store Entry	Count	x				Non-individualised
2.	Store Exit	Count	x				Non-individualised
3.	Visitor	Count	x				Individualised
4.	Visited Zone	Count / Ratio	o	x			Non-individualised
5.	Visits	Count / Ratio	o	x			Individualised
6.	Group Visits	Count / Ratio	o	x			Individualised
7.	Visitors per Group	Count	o	x			Individualised
8.	Zone Visitors	Count	o	x			Individualised
9.	Zone Transitions	Count	o	x			Individualised
10.	Crowd Density	Count	o	x			Individualised
11.	Actions	Count / Ratio	o	o	x		Individualised
12.	Walking	Count / Ratio	o	o	x		Individualised
13.	Dwelling	Count / Ratio	o	o	x		Individualised
14.	Gazing	Count / Ratio	o	o	x		Individualised
15.	Reaching out	Count / Ratio	o	o	x		Individualised
16.	Interactions	Count / Ratio	o	o	o	x	Individualised
17.	Interactions with Products	Count / Ratio	o	o	o	x	Individualised
18.	Interactions with Staff	Count / Ratio	o	o	o	x	Individualised
19.	Interaction with Person	Count / Ratio	o	o	o	x	Individualised
20.	Interactions with Shelves	Count / Ratio	o	o	o	x	Individualised

Table 7.6 In-store customer analytics core metrics

7.6 Maturity Assessment Matrix for In-Store Customer Data

Stationary shop owners face a number of challenges. One of them is competing with online retailers. So far, the advantages online retailers have due to their Web Analytics Data information and due to the fact that pricing and products can be adapted accordingly has not been a major focus in literature. The maturity assessment matrix introduced here provides an overview of the location and behavioral metrics available (subdivided into single and multiple location, actions and interactions, ranging from simple location indication to complex analyses of customer behavior), allowing for different levels of identification (non-individualized, individualized and identified) and assessing the performance of different data collection technologies. In addition, the maturity matrix also assesses the possible application range of the identified core metrics. The core metrics are entered into the matrix at their lowest possible range, and thus are also available at higher maturity, as parent directories are always available to lower branches of a family tree. Therefore, the registration of a ‘Visitor’ requires an individual one-location point measuring device as minimal request. But a more complex system, which can collect data from different locations and is able to

identify customers specifically, can still be used to collect the metrics ‘Visitor’. In the following diagram, proxy technologies are represented in a dark gray font. A tick indicates that the technology has the relevant performance range. A zero indicates that this performance range is not available. White cells in the matrix indicate that the collection of behavior metrics (actions and interactions) is only possible if individualized or identified customer registration is available. Non-individualized data collection such as via light barriers or pressure pads can only yield location metrics and are not able to register and identify physical actions (e.g., picking up a product) or interactions (e.g., talking to staff).

By focusing on the information available rather than on the technologies used to collect data, it becomes clear that most of the core metrics identified here can be provided by systems that allow for individualized data collection. In addition, it becomes evident that specific customer identification is not a real advantage for mere customer data collection. This is different, though, if the aim is to cross-reference the data collected with customer databases.

7.7 Implications

In the digital world, customer data analytics is firmly established already. Stationary retailers can use customer data analysis for a range of development opportunities such as gaining more information on customer behavior before entering into a transaction. Retailers could use this information to tailor the available goods better to customer demand or to tailor the shop setup and product presentation better to the shopping paths of customers or to customer behavior for reviewing the impact of marketing activities on in-store customers. Furthermore, the data could also be used for improved personnel planning, in terms of time and operational area (Chen and Mersereau, 2015, p. 2). Another relevant aspect experienced in the context of online retail is the fact that bulk data provided by Web Analytics has led to a constant assessment and re-adjustment of the offers and services provided.

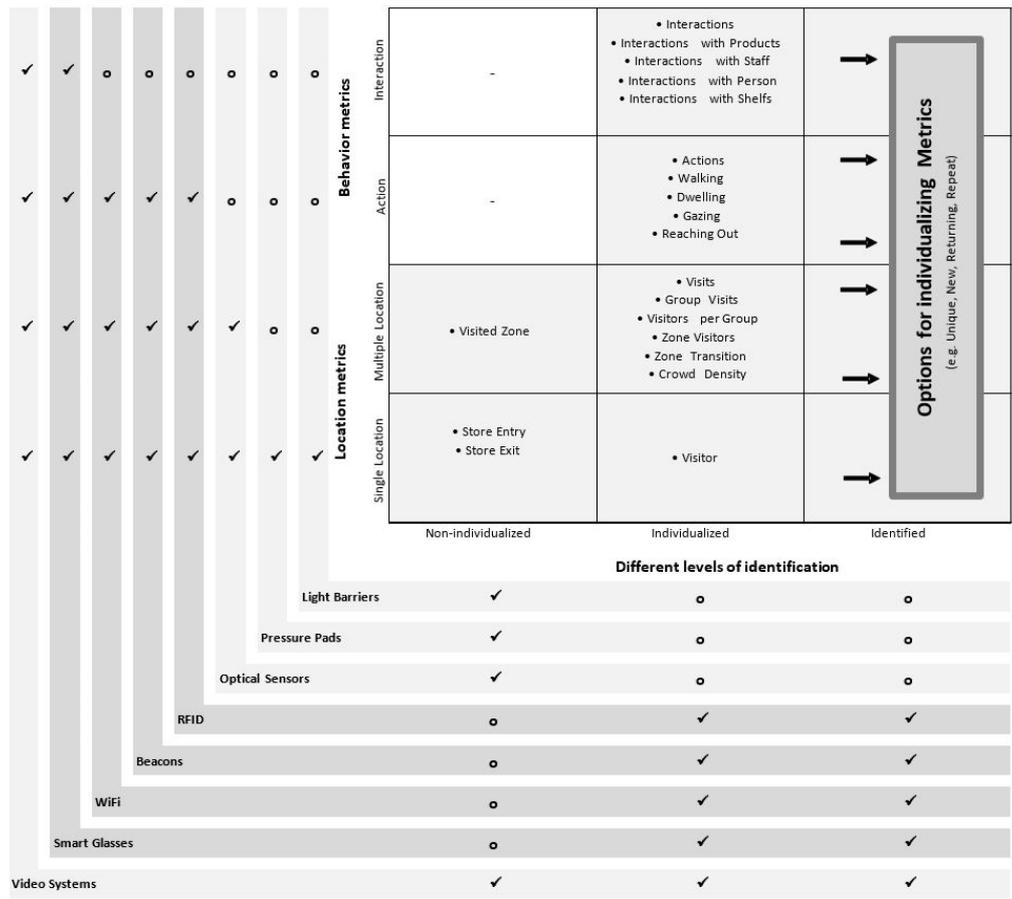


Figure 7.1 Maturity Assessment Matrix for in-store customer data

And, while most rudimentary data collection technology is error-prone and often yields imprecise data, it still offers a significant information insight. Even a simple light barrier would yield a trend-based conversion rate when being cross-referenced with transaction data. However, groups of clients entering a shop are a challenge for most data collection technologies. The fact that rudimentary technologies cannot clearly distinguish between customers and staff, between adults and children and between persons and animals must be taken into account. Nevertheless, retailers have the option to gradually enter into the world of in-store customer analytics, using simple technologies first and then upgrading to more complex options. Today, the full range of customer data analytics is only available using sophisticated CCTV recording systems. However, for the majority of In-Store Customer Analysis Metrics, systems allowing for individualized customer registration are sufficient such as optical sensor systems which have the added advantage that they do not have privacy issues attached to them.

7.8 Conclusion and Recommendations

By means of our systematic literature review, the research questions formulated in the introduction can be answered in the following way: 1) Eight different technologies for the collection of in-store customer data were identified. Light barriers and pressure pads can be characterized as an imprecise solution, but are simple to use and easy to install. Optical sensor systems reveal good insights, but do not allow for customer identification and thus cannot be used to customize the shopping experience. Proxy systems such as RFID, Wi-Fi, beacon technology, smartphone registration, and smart glasses provide a broad range of data collection options, but are characterized by data collection errors and data gaps, due to their indirect data collection system. Video-systems provide the widest performance range, but are also very complex and also have a number of challenges due to privacy issues. 2) 20 core in-store customer analysis core metrics were identified (see Table 7.6), of which 1,248 in-store customer Analysis metrics can be derived (see Table 7.5). 3) By means of the maturity assessment matrix, the different aspects discussed in this paper were combined in order to provide an overview of the performance range of the different technologies and of the in-store customer metrics they can collect. This overview is intended to help retailers decide on what system they might implement, focusing on the type of information they can gain rather than focusing on the available technologies.

This is why this paper opted for a technology-independent overview of available data collection methods. Potential applications based on cross-referencing with transaction data as well as any hybrid systems (such as combining optical sensors with proxy systems) were deliberately excluded from the analysis. Hybrid solutions can overcome the data gaps of normal proxy technologies and also allow for the development of customized offers targeted at specific clients and still respect their privacy. Moreover, the cross-referencing of in-store customer data with transaction data and other customer data is a very interesting area for further research on customer behavior in stationary retail. In-store customer analytics can be a basis for reorganizing your pricing, products and marketing setup in-store. In addition to improving your location-based services, it can also yield important information about customer behavior (Fang et al., 2015, p. 4). Thus, stationary methods for customer data analytics are not only relevant in terms of catching-up to online retailers, but they also offer new business models that cannot be copied easily by online retailers. In order to make this strategy viable, the data collection quality needs to be improved and imprecise or incorrect data must be excluded by the system. It is also vital to work towards using hybrid solutions and cross-referencing in-store customer data with in-store transaction data, but care must be

taken not to infringe the customer's privacy rights. Another important research area would be to add another type of metrics to the metrics classification, i.e., the metrics of context. The collection of context data requires an integrated cross-referencing of all available systems in order to find more contexts for customer behavior, by making use of behavior data and of historic data. Another important next research step would be to study the implementation and application of such systems in a practical setting, focusing on owner-operated stationary retail outlets. The next logical research step would be to study the potential of cross-referencing transaction data with other customer data in an omnichannel retailing context.

8. The Role of E-Intermediaries in Local Retail Hyperlink Networks: A Hyperlink Network Analysis

8.1 Publication Details

Abstract: Local Owner Operated Retail Outlets (LOOROs) are threatened by the digitalization pressure from offline and online competitors on the one hand and by changing shopping habits of customers on the other. The involvement of e-intermediaries like e-marketplaces could help LOOROs to regain competitive power – not only in terms of additional online sales channels, but also with regard to professional online behavior and e.g., online visibility in terms of SEO. However, little is known about LOOROs online networking patterns, link-building strategies and the specific role of e-intermediaries in this matter. To investigate the raised questions, this study analyzes hyperlink networks of local retailers in three German cities. We explored 14.780 websites and identified 12 categories of important stakeholders for local retail hyperlink networks. Our results reveal that LOOROs neglect the opportunities of local online cooperation. E-Intermediaries act as link hubs for local retailers, but local retailers follow passive link-building strategies and hesitate to link to e-intermediaries.

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8.2 Introduction

Despite the omnipresence of large retail chains and pure online players, local owner operated retail outlets (LOOROs) constitute the vast majority of retailers in German cities (HDE, 2017, pp. 3-14). LOOROs are characterized by small-sized store areas, a limited number of staff and high owner-involvement in the day-to-day business operations (Bollweg et al., 2015, p. 3). Although LOOROs operate in a growing market environment, they are exceedingly challenged by the transformation of the retail industry and pressured to adapt their traditional business model to the intense competitive situation in the retail sector. The market share of the LOORO business type has already declined from 26% in 2003 to 17.9% in 2015 (HDE, 2017, p. 9). Further, several independent studies predict a decline in revenue for LOOROs of 30% in the next four years (Dierig, 2017) and about 50% in the next ten years (Siemssen, 2017). The fundamental cause of this negative development is the growing online trade that challenges LOOROs with strong price and service competition, while, at the same time big-box retail outlets and chain stores have started to digitalize their business models and offer multichannel sales and services to their local customers (HDE, 2017, pp. 3-14). At the same time, customers are verifiably changing their shopping habits: as they are already used to online shopping and digital services, accordingly their shopping frequency in city centers is diminishing (IFH, 2016, p. 38). To increase the ability of LOOROs to meet customer expectations and to compete with pure online players and large retail chains, the use of e-intermediaries like e-marketplaces is an intensively discussed approach / research topic (Rossignoli et al., 2014, p. 2) and part of government subsidy programs in Germany (i.e., MWIDE NRW, 2017). E-intermediaries provide brokerage functionality by connecting the supply and demand of goods, information, and/or services (Standing et al., 2010, p. 49-50). For LOOROs, e-intermediaries as e-marketplaces are extra-organizational support for the evolving challenges of e-commerce (Verhoef et al., 2015, pp. 2-3). E-intermediary roles range from simple externalization of online front-end management (e.g., e-commerce site, e-marketplace) to the outsourced management of complex marketing and sales processes related to e-commerce, including pricing, invoicing, and logistics (Alt and Klein, 2011, pp. 7-10). However, little is known about the online networking activities of LOOROs and the specific role of e-intermediaries in this matter. As the local retail sector is composed of businesses that are diverse and independent in nature, explorative research on relationships on the company-level is challenging. In this paper, we therefore analyze hyperlink structures to learn about online networking patterns within the local retail sector.

Hyperlinks are the structural elements of the Web. They are designed and modified by the owners and administrators of the retail websites and reflect their communicative agenda (e.g., exchange of information or maintaining collaborative relationships) (Shumate and Dewitt, 2008, pp. 408-410). Hyperlinks thereby are a type of representational communication because no information flow is involved (Shumate et al., 2016, p. 96). The totality of hyperlinks on a company's website constitutes an inter-organizational network (i.e., Richards and Barnett, 1993) and demonstrates the structural embeddedness of online organizational behavior (Kim et al., 2010, pp. 1599-1600). Therefore, organizational hyperlinking is a purposive and strategic communication choice (Park et al., 2002, pp. 156-158). Hyperlinks have been described as vehicles for the expression of collective identity, public affiliation, credibility, visibility, reputation, authority, and endorsement (Ackland and O'Neil, 2011, pp. 2-5). Furthermore, the resulting link structures play an important role for the visibility of websites in search engines. Active link-building strategies are a core measure of search engine optimization (SEO) (Malaga, 2007, p. 79).

Therefore, in this paper, we aim to analyze the online networking patterns of LOOROs and all other relevant local retail stakeholders. A thorough understanding of online connections between the stakeholders can provide valuable insights into LOOROs online networking strategies and the specific role of e-intermediaries in this matter. Furthermore, it can shed light on how to promote local retailers online visibility and on how to improve their network relationships with e-intermediaries. Accordingly, we aim to answer the following research questions:

RQ1: *What hyperlink structures exist among the stakeholders of local retail?*

RQ2: *Is there a visible link-building strategy of LOOROs?*

RQ3: *What role do e-intermediaries play in local retail hyperlink networks?*

This study is structured as follows: In the sections 8.3 and 8.4, we discuss the theoretical and methodological background. In section 8.5, we describe the research framework and the conducted analysis. In section 8.6, we discuss our findings and point out the implications and limitations of our research.

8.3 Theoretical Background

Hyperlink Network Analysis (HNA) is a subset of Social Network Analysis (SNA). SNA is the process of investigating social structures by applying networks and graph theory (i.e.,

Richards and Barnett, 1993). A social network is a representation of social structures, containing components (people, organizations or other social entities) and relationships such as friendships, affiliations and information exchange (Rogers and Kincaid, 1981, p. 52). SNA examines the structures of social networks, based on the analysis of relationships (also referred to as links) among the system components (also referred to as nodes) (Rogers and Kincaid, 1981, p. 281; Ackland and O'Neil, 2011, p. 4). The difference between hyperlink and social network analysis is that HNA does not analyze social relationships. HNA relies on the use of hyperlink data that can be obtained only from websites. A hyperlink network emerges if at least two nodes (two websites) are connected through hyperlinks. HNA therefore requires an exploratory analysis of the hypertext markup (HTML) of websites to determine if there is a unilateral or bilateral hyperlink relationship between the examined websites (Rogers and Kincaid, 1981, p. 281). This procedure is named link mining and is usually carried out by web crawlers (Ackland and O'Neil, 2011, p. 14). In contrast to SNA, in HNA it is difficult to assign weights to links between nodes (websites) as link mining does not collect any additional information or attributes about links, like e.g., the interaction intensity (traffic) between the linked nodes. HNA assesses the importance of nodes by interpreting the identified link structure, considering also secondary data, e.g., external attributes of the nodes based on grouping, clustering or classification (Ackland and O'Neil, 2011, p. 17). For the examination and assessment of hyperlink networks, 1) link based and 2) network related measures are applicable.

1) Link-based object ranking: The PageRank (Page et al., 1999, pp. 3-4) and HITS (Kleinberg, 1999, pp. 622-625) algorithms are the most notable approaches for link-based object ranking. PageRank looks at the number and quality of links to a page to determine a rough estimation of the importance of a website (Page et al., 1999, pp. 3-4; Getoor and Diehl, 2005, p. 4). The underlying assumption is that more important websites are likely to receive more links from other websites (link impact) (Getoor and Diehl, 2005, p. 5). The HITS algorithm takes this assumption one step further and differentiates between two types/qualities of web pages, called hub and authority. Hubs are web pages that link to many authoritative pages. Authorities are web pages that are linked to by many hubs. Each page in the web is assigned hub and authority scores. The algorithm computes the scores as part of an iterative process and regularly updates the scores of a page based on the scores of the pages in its immediate neighborhood (Kleinberg, 1999, pp. 622-625).

2) Network theory: The measures of network and graph theory are derived from the relationships between the nodes of a network. Degree, for example, is the number of

relations (links) of a node (websites) in a network. In directed networks, an in-degree (e.g., number of incoming links) and out-degree (e.g., number of outgoing links) can be measured (Scott, 2011, p. 22). Based on the relationships between nodes it is also possible to compute the network density of the network and the positioning of single nodes within the network. Network density represents the portion of all possible connections within a network that are actually present (Mitchell, 1969, p. 226). It thus indicates the overall level of integration of the assessed hyperlink network. Ranging from 0% (every node is isolated) to 100% (all nodes are connected with each other), network density is computed as the number of actual connections between nodes divided by the number of possible connections (Scott, 2011, p. 22). Network centrality, in contrast, refers to the extent to which a node (website) holds a central position in a hyperlink network (Scott, 2011, p. 22). In a connected graph, closeness centrality is an indicator of the extent to which a given node has short paths to all other nodes in the graph. It is calculated as the sum of the length of the shortest paths between the node and all other nodes in the graph. Thus, the closer a node is to all other nodes, the more central it is. Closeness centrality is a reasonable measure to identify nodes in the “center” of a given network (Lusher and Ackland, 2011, p. 22). Further, for every pair of vertices in a connected graph, there is one shortest path between them. Either the number of edges that the path passes through (for unweighted graphs), or the sum of the weights of the edges (for weighted graphs) that the path passes through, is minimized on this shortest path. Betweenness centrality measures the number of such shortest paths going through each vertex (Scott, 2017, pp. 96-107). The measure thus indicates, which individual nodes play a “brokering” or “bridging” role within a network.

8.4 Methodology

We carried out the HNA in 5 steps: 1) Definition of scope and sample: First, we defined a clear research scope and chose a representative sample of retailers accordingly. 2) Seed list development: The seed list is the starting list for the examination. It is based on the chosen sample of retailers, from which we have identified and collected the seed URLs for the link mining process. 3) Link Mining: Using a web crawler, we collected the hyperlink data from the seed URLs as well as from the linked network pages. 4) Network Analysis: From the collected link data, we derived the hyperlink networks, which we then analyzed. 5) Interpretation: Finally, we analyzed and interpreted the revealed network data regarding the presented theoretical background (Ackland, 2013, pp. 78-86).



Figure 8.1 Research procedure

8.5 Analysis

In our study, all types of resident stationary retailers are considered part of the examination group for local retail hyperlink networks. According to the German Retail Federation, local retailers can be categorized into three types (HDE, 2017, p. 9): 1) Local Owner Operated Retail Outlets and 2) Local Chain Stores, both dealing with fast moving consumer goods (FMCG), and 3) Local Specialized Stores, doing business with capital or durable goods (e.g., car dealer).

To gain a better understanding of local retail hyperlink networks and network patterns in Germany, we selected a set of three heterogeneous examination areas (German cities), including one small (10.000-30.000 inh.), one medium (30.000-100.000 inh.), and one large city (>100.000 inh.) (De Beule et al., 2015, pp. 8-10), with at least one subsidized e-intermediary in each: 1) Attendorn (24.786 inhabitants), as a sample small size city located in North Rhine-Westphalia with a total 103 local retailers; 2) Wolfenbüttel (53.779 inhabitants), as a sample medium size city, located in Lower Saxony with a total 114 local retailers; 3) Heilbronn (122.579 inhabitants), as a sample large city, located in Baden-Wuerttemberg with a total 259 local retailers.

To get an overview of the current state of local retail in each city, we conducted an explorative web research among online vendor archives and city information websites. Subsequently, we established a local retail database for each city including all resident stationery retailers. From this database, we then selected all local retailers with a web presence, resulting in the three seed lists for the HNA:

1) The seed list for Attendorn contains 75 URLs for 103 local retailers (73%), covering 48 LOOROs, 12 Chain Stores, and 15 Specialized Stores. 2) The seed list for Wolfenbüttel contains 50 URLs for 114 local retailers (44%), covering 31 LOOROs, 17 Chain Stores, and 2 Specialized Stores. And finally, 3) the seed list for Heilbronn contains 199 URLs (77%) for 259 local retailers, covering 97 LOOROs, 88 Chain Stores, and 14 Specialized Stores.

8.5.1 Data Collection / Link Mining

We collected the link data in July 2017, harnessing the VOSON web crawler (www.uberlink.com) to visit each of the given seed URLs. The VOSON crawler was configured to focus on outbound links and to ignore internal links. For each seed page, the following stop criteria for the crawling process were defined: > 1000 OutLinks (max. OutLinks); > 25 pages crawled without finding a new outbound link (max. unproductive pages); > 50 pages crawled (max. depth of crawl / pages), and > 2 levels crawled (depth of crawl / levels) (Ackland, 2013, p. 86).

The crawling results helped us derive three types of hyperlink networks, which we used to develop the final stakeholder network for our analysis:

- 1) **The Seed Network**, purely based on the hyperlinks of the local retailers of each city.
- 2) **The Full Network**, containing all identified and explored stakeholders of the local retail hyperlink network.
- 3) **The Seed + Important Stakeholder Network** as a compressed network, including all local retailers and important stakeholders. We considered a stakeholder important when it contained links to at least two seed sites of the local retail hyperlink network (Ackland and O’Neil, 2011, p. 15). For the analysis of the discovered networks, we used Gephi (www.gephi.org) as an open source software. Fig. 8.2 shows the identified Seed+Important Networks for the three cities, which we discuss in the following section.

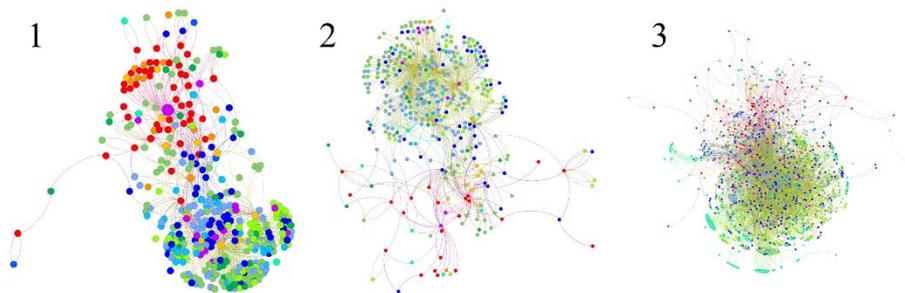


Figure 8.2 Seed+Important Networks 1) Attendorf, 2) Wolfenbüttel, 3) Heilbronn

8.5.2 Node Classification and Stakeholder Network

Since the explored Seed+Important and Full Networks are highly complex, we classified all important stakeholders of the local retail hyperlink networks. The categorization is based on the stakeholder classification of Chua et al. (2005), who differentiate between five groups of

e-commerce retail stakeholders: customers, retail organizations, suppliers, regulators and indirect stakeholders. We extended this categorization by 12 subtypes in order to allow for a more detailed analysis of local retail hyperlink networks:

1.	LOOROs		Websites of local owner operated retail outlets
2.	Chain Stores		Websites of local resident retail chains
3.	Specialized Stores		Websites of local resident specialized stores
4.	Intermediaries		E-Marketplaces (e.g., local shopping platforms, ebay, amazon)
5.	Non-Local Retailer		Websites of non-local resident retailers
6.	Manufacturer		Websites of manufacturers
7.	Service Provider		Websites of service providers
8.	I&C Provider		Websites of information and communication providers
9.	Web Archives		Web-Archives (e.g., address archives of local shops)
10.	Public Sector		Websites of city administration and local clubs
11.	Spam		Content and link pharms and malicious websites
12.	Miscellaneous		Other websites, e.g., foreign language websites

Table 8.1 Stakeholder categories & color code

With the help of these stakeholder categories, we derived a final less complex hyperlink network: **4) The Stakeholder Network**. This network shows all explored actors grouped along the 12 stakeholder subcategories (see fig. 8.4 below).

	Seed Network	S+I Network	Full Network	Stakeholder Network
Attendorn	75	371	2328	
Wolfenbüttel	50	395	2617	12
Heilbronn	199	1671	9835	

Table 8.2 Overview network size (nodes)

8.6 Discussion and Conclusion

With the help of the VOSON web crawler and a link mining approach, we investigated local retail hyperlink networks of three German cities. We explored 14780 websites of possible stakeholders and labeled 2437 websites that were considered important according to a developed stakeholder categorization (see Table 8.1).

Regarding the first research question “*What hyperlink structures exist among the stakeholders of local retail?*” our results show (see fig. 8.3 below) that there are no direct hyperlink networks between local retailers. If at all, only a very few retailers link to each other.

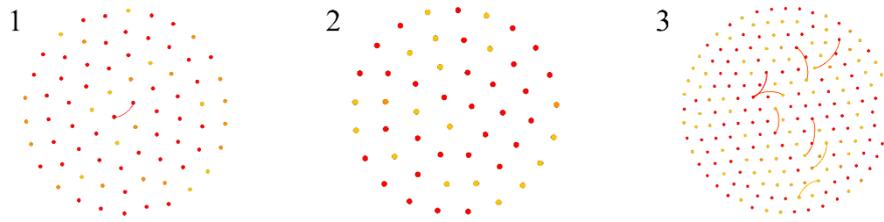


Figure 8.3 Seed Networks 1) Attendorn, 2) Wolfenbüttel, 3) Heilbronn

However, local hyperlink networks between local retailers and other retail stakeholders are present. Our explorative analysis discovered that all 12 considered stakeholder groups have hyperlink connections to at least two other groups (Table 8.4 / Figure 8.4).

Concerning the relationships between the stakeholders in the identified networks, our results show that the local chain stores have the highest degree and due to the high number of InLinks they act as link authorities (Table 8.4). LOOROs have a high degree of InLinks as well, but significantly fewer relationships compared to Chain Stores (e.g., average degree in Heilbronn, LOOROs 19 and Chain Stores 21). Specialized Stores also tend to be authorities.

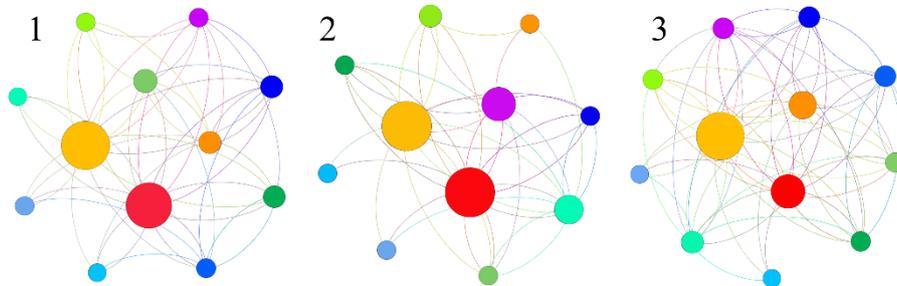


Figure 8.4 Stakeholder Networks 1) Attendorn, 2) Wolfenbüttel, 3) Heilbronn (Node size according to betweenness centrality)

With regard to the examined link structures, all groups of retailers hesitate to implement OutLinks and rely mainly on InLinks (e.g., indegree/outdegree of retail chains for S+I: Attendorn 513/61, Wolfenbüttel 752/92, Heilbronn 3756/629). Further, local retailers and in particular LOOROs seem to be reluctant to link to e-intermediaries, which could extend their service capabilities (e.g., product visibility, product information, online shopping functionality, etc.) for their customers (Malaga, 2007, p. 72). On the contrary, e-

intermediaries act as link hubs within the hyperlink networks, mainly targeting all three groups of local retailers.

The sparse link building between the local retailers leads to a low overall network density below 1% for all three cities' Seed+Important networks. These low network densities indicate a low bond between the stakeholders of the local retail hyperlink networks. Due to the aggregation of "important" nodes into stakeholder categories, the density of the stakeholder networks is significantly higher (see Table 8.3), but still only on a medium level.

	Nodes S+I	Links S+I	Density S+I	Nodes Stakeholder	Links Stakeholder	Density Stakeholder
Attendorn	371	845	0.62%	12	56	42.42%
Wolfenbüttel	395	1000	0.64%	11	43	39.09%
Heilbronn	1671	5285	0.19%	12	72	54.55%

Table 8.3 Network density for S+I and Stakeholder Networks

E-intermediaries act as central nodes within the local retail networks (Attendorn 0.733, Wolfenbüttel 1.000, Heilbronn 0.769), as they are connected to most of the other explored stakeholders. However, the Local Chains and LOOROs also act as brokers in the local hyperlink networks (e.g., Attendorn: LOOROs 29.7, Chain Stores 32.8). Most of the nodes are connected through them. All results for centrality are provided in Table 8.4.

With regards to our second research question "*Is there a visible link-building strategy of LOOROs?*" our analysis shows that LOOROs do not link to other local retailers. This finding is in line with hyperlink research on tourism providers located in one city (Ying et al. 2016, pp. 30-31). It seems that local businesses do not yet understand the relevance and the opportunities of local networking and local link building, e.g., in terms of search engine visibility (Malaga, 2007, p. 72) and clickstream optimization (Besbes et al., 2016, pp. 26-30). Accordingly, there is no local hyperlink network among local retailers. However, there are connections between LOOROs and the other stakeholders, which rely mainly on link-building from the other stakeholders. In conclusion, if at all, LOOROs follow a passive link strategy and only collect InLinks. We found no proof for an active link-building strategy.

Stakeholder Category	Indegree	Outdegree	Degree	Indegree (S+I)	Outdegree (S+I)	Degree (S+I)	Closness centrality	Betweenness centrality	Hits Auth	Hits Hub
Stakeholder Network Attendorn										
LOOROs	3	4	7	104	75	179	0.733	29.7	0.449	0.321
Local Chains	1	11	12	513	61	574	0.688	32.8	0.479	0.264
Specialized Stores	1	0	1	41	14	55	0.478	5.15	0.347	0.163
Intermediaries	0	2	2	9	109	118	0.733	1.59	0.11	0.453
Non-Local Retailer	2	1	2	2	6	8	0.524	0.81	0.11	0.174
Manufacturer	1	1	2	12	6	18	0.611	1.92	0.292	0.294
Service Provider	0	3	3	75	133	208	0.688	6.38	0.226	0.413
I&C Provider	0	2	2	70	88	158	0.579	4.90	0.359	0.24
Web Archives	0	2	2	1	150	151	0.611	1.48	0.05	0.294
Public Sector	0	2	2	12	40	52	0.550	4.59	0.281	0.229
Spam	0	2	2	1	74	75	0.611	0.64	0.06	0.294
Miscellaneous	0	2	2	5	89	94	0.458	1.03	0.273	0.155
Stakeholder Network Wolfenbüttel										
LOOROs	8	6	14	40	77	117	0.800	19.00	0.456	0.345
Local Chains	8	6	14	752	92	844	0.800	19.00	0.456	0.345
Specialized Stores	1	2	3	1	2	3	0.500	0.00	0.103	0.151
Intermediaries	2	8	10	7	43	50	1.000	9.33	0.137	0.520
Non Local Retailer	8	4	12	26	18	44	0.615	6.33	0.492	0.300
Manufacturer	-	-	-	-	-	-	-	-	-	-
Service Provider	4	3	7	84	227	311	0.571	0.33	0.300	0.279
I&C Provider	4	3	7	66	63	129	0.571	0.33	0	0.279
Web Archives	0	3	3	0	308	308	0.563	0.00	0.300	0.279
Public Sector	4	4	8	17	60	77	0.571	0.33	0.240	0.279
Spam	0	2	2	0	43	43	0.529	0.00	0	0.181
Miscellaneous	4	2	6	7	67	74	0.533	2.33	0.270	0.181
Stakeholder Network Heilbronn										
LOOROs	10	9	19	385	236	621	0.833	11.65	0.377	0.343
Local Chains	11	10	21	3756	629	4385	0.909	21.78	0.429	0.352
Specialized Stores	10	5	15	162	39	201	0.588	7.07	0.431	0.206
Intermediaries	6	8	14	22	172	194	0.769	2.23	0.241	0.362
Non Local Retailer	6	9	15	133	179	312	0.833	3.17	0.229	0.394
Manufacturer	6	6	12	41	76	117	0.714	2.42	0.247	0.327
Service Provider	6	4	10	339	1103	1442	0.625	1.35	0.303	0.226
I&C Provider	6	5	11	319	670	989	0.667	2.27	0.303	0.263
Web Archives	1	4	5	1	816	817	0.625	0.13	0.054	0.224
Public Sector	6	4	10	67	252	319	0.625	1.35	0.303	0.226
Spam	0	4	4	0	325	325	0.611	0.00	0	0.224
Miscellaneous	4	4	8	60	788	848	0.625	1.60	0.198	0.225

Table 8.4 Network data

With regards to our last research question “*What is the role of e-intermediaries in local retail hyperlink networks?*” our results show that e-intermediaries play a central role in the analyzed local retail hyperlink networks. They have relationships with most of the other stakeholders and have a high closeness centrality. Furthermore, e-intermediaries act as link hubs and mainly target local retailers. However, the brokerage power of the e-intermediaries within the networks and between the stakeholders is limited. The low average betweenness

centrality of the e-intermediaries is attributable to two facts: 1) LOOROs hesitate to link to e-intermediaries and therefore thwart their brokerage role. 2) Consumers, as the second important target group of e-intermediaries, were not considered in the hyperlink networks. Accordingly, the full brokerage power of e-intermediaries could not be ascertained in the above analysis (Giaglis et al., 2002, p. 243). The low levels of integration of e-intermediaries in the local retail hyperlink networks in general, and the reluctance of the local retailers regarding OutLinks in specific, are indicators of the inefficient utilization of e-intermediaries in local retail communities.

Practical Implications: Our findings provide valuable insights for the owners of LOOROs and e-intermediaries. LOOROs should revise their link policy and start linking to the e-intermediaries that they collaborate with. They would benefit in at least two ways: 1) Search Engine visibility: Link building is an essential SEO measure and will increase the ranking of LOORO websites as well as the websites of the e-intermediaries (Malaga, 2007, p. 70). 2) Service infrastructure: With the help of links to e-intermediaries, LOOROs can offer additional online sales and service channels to their customers and website visitors (Besbes et al., 2016, pp. 26-30). When LOOROs sell through e-marketplaces and do not link to them from their own web presence, they solely depend on the native visitors of the e-marketplace, and waste the opportunity to offer digital sales and service channels to their own customers. This is becoming more and more problematic, as customers are changing their shopping habits (IFH, 2016, p. 38) and are adopting practices like showrooming (research offline and purchase online) (Nesar and Sabir, 2016, pp. 50-51).

E-intermediaries need to recognize this linking failure of local retailers and should provide information and training on the benefits of links to their business partners. LOOROs, in particular, appear unable to integrate e-intermediaries efficiently, in order to facilitate seamless access to digital sales and service channels to their customers and to use click-stream optimization (De Beule et al., 2015, p. 18; Besbes et al., 2016, pp. 26-30).

Limitations and Future Research: Due to the high pace of digital change, the manually derived seed lists for the HNA can only be considered as snapshots. Furthermore, the necessary stop rules for the VOSON crawler limited the link collection. Huge sites (with more than 50 pages) and sites with many links (more than 1000) were not completely analyzed, as this would have overwhelmed our resources. Finally, the conducted crawling process could not reveal any profiling information about the examined websites at this point. Thus, for example, missing information on the SEO-level of a website, the used content

management systems, the used shop system(s), etc., limited the explanatory power of the study.

Reflecting on our approach and our findings, future research on the following aspects would be valuable: 1) HNA Process Improvement: How can web and data mining approaches help overcome manual seed list development and manual classification of discovered nodes (automatic node recognition)? 2) Node-Profiles: How can crawler-based node profiling improve the explanatory power of the analysis? 3) Link Building for LOOROs: How can LOOROs be motivated to link to and cooperate with other local retail stakeholders online?

9. Are Local Retailers Conquering the Long Tail? A Web Usage and Association Rule Mining Approach on Local Shopping Platforms

9.1 Publication Details

Abstract: Competitors and customers put Local Owner Operated Retail Outlets (LOOROs) under digitalization pressure. Local Shopping Platforms (LSP) seem to be a promising approach for LOOROs to tackle the digitalization challenge and to overcome their physical and locational disadvantages compared to e-commerce players. However, little is known about the actual performance of LSPs and the (shopping) behavior of the LSP visitors. In this study, we therefore assess the web usage data of five German LSPs. Our findings show that LSPs provide a digital sales and service channel to LOOROs that extends their local catchment area and facilitates their online visibility and accessibility. However, LSPs so far miss the opportunity to create an inter-organizational shopping environment. LSP visitors do not browse across product offers of various vendors, but they mostly follow a single product search strategy and ignore the intended local marketplace structure of the platforms.

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9.2 Introduction

In an overall positively developing market environment Local Owner Operated Retail Outlets (LOOROs) face an intense business and market transformation (Bollweg et al., 2015, p. 8). Several independent studies predict a decline in revenue for German LOOROs of 30% within the next four years (Dierig, 2017) and even 50% within the next ten years (Siemssen, 2017). In particular, the digitalization of sales channels is challenging the traditional hit-driven business models of the small stationery retailers. For decades, a hit-driven approach was a natural consequence of their limited shelf space, preventing them from carrying everything for everybody (Anderson, 2008, p. 18). According to Anderson (2008), traditional stationery retailers face two main disadvantages in comparison to online retailers: 1) Physically limited shelf and sales space forces them to focus on a strictly limited range of products and to exclude any (long tail) niche products from their shops. 2) Regional if not only local catchment areas and regulated opening hours limit the demand for their goods and services (Pantano and Viassone, 2014, p. 3). In today's age of the internet and e-commerce, digital distribution channels like esp. online shops and e-marketplaces challenge such traditional business models, as physical, regional and time limitations do not exist in online retail (Pantano and Viassone, 2014, p. 4). In his widely acknowledged book "Long Tail", Anderson (2008) summarizes the disruptive development in retail as follows: *"Our culture and economy are increasingly shifting away from a focus on a relatively small number of hits (mainstream products and markets) at the head of the demand curve, and moving toward a huge number of niches in the tail. In an era without the constraints of physical shelf space and other bottlenecks of distribution, narrowly targeted goods and services can be as economically attractive as mainstream fare."* (Anderson, 2008, p. 4)

However, LOOROs have options. Currently, Local Shopping Platforms (LSP), which act as intermediaries between LOOROs and their customers, are spreading in German cities (Bach 2015). The advent of LSPs has many ties to the long tradition of e-marketplaces, which, as inter-organizational information system, allow buyers and sellers to 1) exchange and negotiate prices and product characteristics and 2) to complete transactions (Standing et al. 2010, pp. 49-50). The same is true for LSPs, but these added a very interesting twist to their business models. Striving for the critical mass of buyers, sellers and transactions, almost all well-known and successful e-marketplaces operate on a national if not international scale and address all types of customers, serving any sort of B2B, B2C or C2C transaction. In contrast, LSPs put forward locational self-restrictions and made them a fundamental part of their business models and marketing strategies. Either they allow only local retailers to

operate on their platform, and/or they serve only local customers. LSPs harness the resulting local structure as a source of unique selling propositions, like e.g., delivery time advantages or service offers based on the direct neighborhood of the local shops (as decentralized storages) and the local customers (Reimann, 2015).

LSPs are without question a promising option for LOOROs as they can help to overcome many of the e-commerce entry barriers (e.g., financial constraints, lack of knowledge, lack of infrastructure, etc.) (Sandberg and Håkansson, 2014, p. 5). Besides being a marketplace, they also act as digital service providers for LOOROs, releasing them from the burden of building up their own digital infrastructure and hiring expensive knowledgeable e-commerce experts. Furthermore, LSPs enable cooperation among competitors and thus facilitate synergy effects and cost savings for online activities (Huber et al., 2004, pp. 1-3).

On the other hand, joining an LSP can go along with problematic side effects, as LOOROs then become part of the self-reinforcing spiral of ubiquitous online price competition (Alt and Klein, 2011, p. 6). Further, LSPs charge LOOROs subscription and transaction fees, also drawing from their margins. Finally, it remains unclear, whether local people will accept the limited local e-marketplaces, when global competitors like eBay and Amazon with their unlimited customer base and their broad product and service range are just one click away (Verhoef et al., 2015, pp. 2-3).

Against this background, we aim to answer the following research questions:

RQ1: *Do local shopping platforms in fact help LOOROs to overcome physical and locational disadvantages compared to e-commerce players?*

RQ2: *Do the origins and preferences of LSP visitors offer insights into potential “Long Tail” opportunities for LOOROs?*

To answer the raised questions, we will use Web Usage Mining and Association Rule Analysis. We search for frequent usage patterns geared to Long Tail opportunities (e.g., expansion of the catchment area, the opening hours and/or demand for digital shelf extensions) within the web usage data of five local shopping platforms under the roof of one LSP provider in Germany. Each of the platforms is operating separately in one city and its surrounding region. Together, the platforms serve an installed basis of 238 LOOROs.

The remainder of this paper is structured as follows: In section 9.3, we discuss the methodological background. In section 9.4, we conduct the Web Usage and Association Rule Mining procedures and present the according results. In section 9.5, we discuss our findings

to answer the research questions, highlight limitations and derive future research opportunities.

9.3 Methodology

9.3.1 Web Usage Mining

Web usage mining is the application of statistics and data mining techniques to discover usage patterns from web usage data like web logs and web tracking reports (Nagi et al., 2011, pp. 167-168). The goal of Web Usage Mining is to capture, model, and analyze the behavioral patterns and profiles of users interacting with a website (Kumar and Rukmani, 2010, p. 400). The Web Usage Mining process consists of three phases, namely data preprocessing, pattern discovery and pattern analysis (Chen et al., 2005, p. 340). In the preprocessing stage, the web usage data needs to be cleansed from irrelevant and unreasonable items. In the pattern discovery stage, statistical, database, and machine learning operations are performed to obtain hidden patterns reflecting the behavior of users. In the final pattern analysis, the discovered patterns and statistics are further processed, filtered and used as input for a variety of data-mining algorithms (Nagi et al., 2011, pp. 168-169).

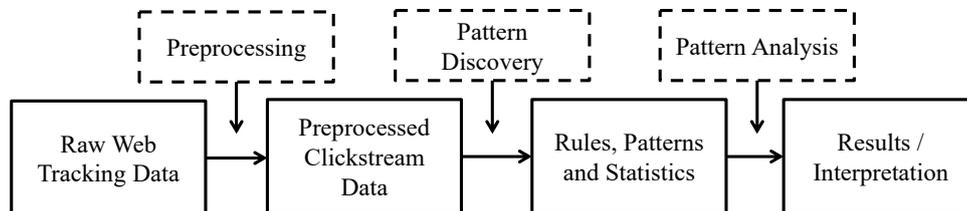


Figure 9.1 Research Procedure based on Nagi et al. (2011)

9.3.2 Association Rule Mining

Association Rule Mining on web usage data aims at finding “frequent item” sets, as groups of items (e.g., products or web pages) commonly accessed or purchased together (Raorane et al., 2012, p. 21). Such item sets can be one-dimensional (e.g., only products) or multi-dimensional (e.g., products and time stamps) (Borgelt 2012, pp. 347-348). An association rule expresses an association between an antecedent and a consequent (sets of) item(s) in a shared interaction (e.g., page views in one session) (Borgelt and Kruse, 2002, p. 1). The association rule r is an expression of $X \rightarrow Y$ (σ , α), with X and Y as item sets, σ as support ($X \cup Y$), representing the share of interactions in which X and Y occur together, and α as confidence, representing the conditional probability that Y occurs in an interaction that already includes X (Borgelt and Kruse, 2002, p. 2). An association rule is sound if the

response within the target item group (confidence) is much better than the average response for the whole dataset. This is assessed using the metric lift, as the ratio of the response in the target item group and the average response of the whole data set. A lift of <1 or 1 implies that the probability of the occurrence of the antecedent and the consequent are independent of each other and that no rule exists. If lift is >1 , the actual value indicates the degree to which a dependency exists, and thus how useful a derived rule would be for predicting the consequent in future data sets (Borgelt, 2012, pp. 449-450). The Apriori algorithm is a well-known algorithm for finding association rules (Borgelt and Kruse, 2002, p. 1). We used the version implemented by Borgelt and Kruse (2002).

9.4 Analysis

9.4.1 Dataset

To answer the raised research questions, we analyzed the 1) web usage data and the 2) product databases of five LSPs managed by a German local shopping platform provider:

1) The available web usage data, retrieved from Google Analytics, consists of a custom session ID (int), the users' country and city (derived by Google from the IP addresses of the users (string)), the URL of the visited website (string) and the date, hour and minute of the visited webpage (string). The specification of the data is available as part of the Google Analytics Reporting API v4 reference (Google, 2017a).

2) The product data consists of the product name (string), the product URL (string), the product category (string), the vendor name (string), and the vendor category (string). Table 9.1 shows examples of the retrieved product and vendors categories.

We conducted the data preprocessing, the pattern discovery, and the analysis of the web usage data using the KNIME analytics platform (www.knime.com).

Top 8 Product Categories		Product Views	Top 8 Vendor Categories		Product Views
1.	Local Food & Beverage	9416	1.	Grocery Store	10238
2.	Home & Garden	7326	2.	Jewelry Store	6551
3.	Fashion	6996	3.	Book Store	6395
4.	Media & Books	5214	4.	Hobby Shop	5067
5.	Gifts	2927	5.	Furniture Store	3655
6.	Toys	2783	6.	Office Equipment Store	1708
7.	Sports Equipment	1954	7.	Liquor Store	1310
8.	Art	1860	8.	Pharmacy	1211

Table 9.1 Overview top 8 product and vendor categories

9.4.2 Data Preprocessing

For our analysis, we needed to transform and aggregate the web usage data on different levels of abstraction. In web usage mining, the most basic level of abstraction is a page view (Chen et al., 2005, p. 340). Regarding the website visitor, the most basic level of behavioral abstraction is a session, as a sequence of interactions (page views) by a single user in a given time (usually during a single visit) (Chen et al., 2005, p. 341). We examined frequent usage patterns and preferences on the following levels of abstraction: 1) page views 2) user sessions, and 3) location and time.

First, we cleansed the web usage data from entries not necessary/relevant for the mining process (Nagi et al., 2011, pp. 168-169). The initial data set included 487,906 unique page views. We removed all backend related page views (admin or login pages) to eliminate as many page views generated by vendors as possible. Further, we excluded all incomplete page view entries, for example in case of missing locational data, leading to 433,771 remaining datasets. These included 100,681 views of the global homepage, 56,555 views of global content pages (like the imprint, terms and conditions, jobs, etc.), 210,755 views of local product category pages, and 69,760 views of product pages.

In a second step, we preprocessed the sample of product page views for a location and time related analysis. As the time stamp for each interaction and the origin of the visitor were part of the data, only the platform location needed to be added as a reference for distance calculations. The online platform architecture uses one global homepage and local entry pages (as city names) for each local shopping platform on different domain levels. This way, we were able to derive the locational dependency of each page view directly from the URL structure.

In a third step, we joined the two tables (web usage data + product database) using the URL as a unique key available in both tables.

Google Analytics						Products Database		
Session ID	Visitor Country	Visitor City	URL	Date / Time	Platform City	Product Category	Vendor Name	Vendor Category

Table 9.2 Preprocessed data structure

9.4.3 Pattern Discovery

1) Location & Distance Categories: To identify locational usage patterns and preferences of LSP visitors, we developed a location & distance based categorization. Research on buying power and catchment areas of local shops usually sorts visitors into four different groups based on the distances between the location of the visitors and the location of the platform (Wieland, 2011, p. 18): 1) Local Catchment Area: visits from within a fifteen kilometer radius around the location of the visited platform; 2) Distant Catchment Area: visits from outside the 15 km radius, but from within a 50 km radius around the visited platform; 3) Online Shopping Distance: visits from outside the 50 km radius of the platform, but from within Germany; 4) Foreign Country Distance: all visits from outside Germany. To implement these categories, we extracted the longitude and latitude of the cities using the Google Geocoding API (Google, 2017b). With these coordinates at hand we then calculated the distances between each platform and its visitors, applying the Haversine formula. The Haversine formula, which is gaining growing attention in navigational contexts, calculates great-circle distances between two points (d) on a sphere (r), based on their longitude (λ) and latitude (Φ) coordinates (Van Brummelen, 2013, p. 94).

$$d = 2r \arcsin \left(\sqrt{\sin^2 \left(\frac{\phi_2 - \phi_1}{2} \right) + \cos(\phi_1) \cos(\phi_2) \sin^2 \left(\frac{\lambda_2 - \lambda_1}{2} \right)} \right)$$

Figure 9.2 Havesine formular

Table 9.3 provides an overview of our findings. More than 60% of all LSP visitors accessed the platform from a location more than 50 km away, what we consider as online shopping distance. Only 15% of the users accessed the platform from within the city itself. The results indicate that the self-restriction of LSPs to serve only local customers is contradicting the actually visitor structure and needs revision (Bach, 2015; Reimann, 2015).

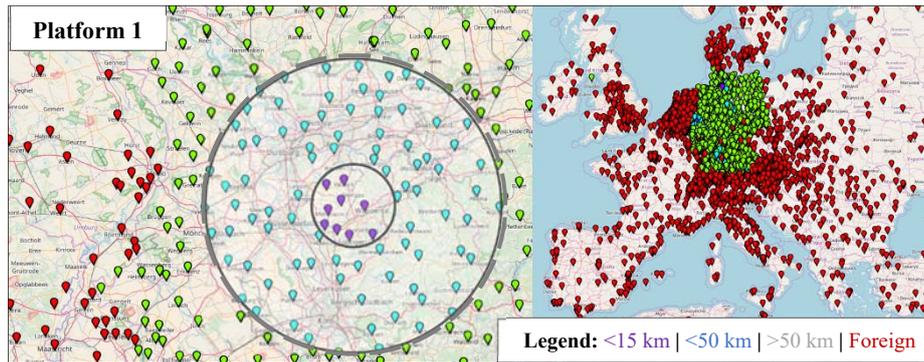


Figure 9.3 Distance categories and visitor origins

Location	Total	%	P1	%	P2	%	P3	%	P4	%	P5	%
Local	10263	14.7	7379	16.0	1391	12.6	364	7.0	606	12.3	523	21.6
Distant	8725	12.5	6963	15.1	805	7.3	720	13.9	194	3.9	43	1.8
Online	42170	60.5	26148	56.7	7444	67.2	3437	66.5	3533	71.5	1608	66.4
Foreign	8602	12.3	5653	12.3	1442	13.0	650	12.6	610	12.3	247	10.2

Table 9.3 Overview distance categories / product views

2) Time Categories: Also regarding time, we developed a categorization for platform visits, which we derived from the regular opening hours of local shops. As there are no standard opening hours in Germany, we defined the categories considering the development of the opening hour regulations. Traditionally, since 1956, German retailers had core opening hours between 10 am and 6 pm. A first extension allowed them to open their doors from 6am to 6pm. From on 1989, retailers were allowed to keep their stores open until 8 pm. Since 2006, opening hours are subject to state law and most federal states extended the timeframe to 10 pm or even midnight (e.g., Fischer, 2003; Hilf and Jacobsen, 2000). Accordingly, we differentiate the following access time categories for platform visits: 1) Early opening hours, covering the time between 6am and 10am; 2) Traditional opening hours, covering the time between 10am and 6pm; 3) Late opening hours, covering the time between 6pm and 10pm; 4) Night / Closing time, covering the time between 22pm and 6am (when stationary retail stores are closed).

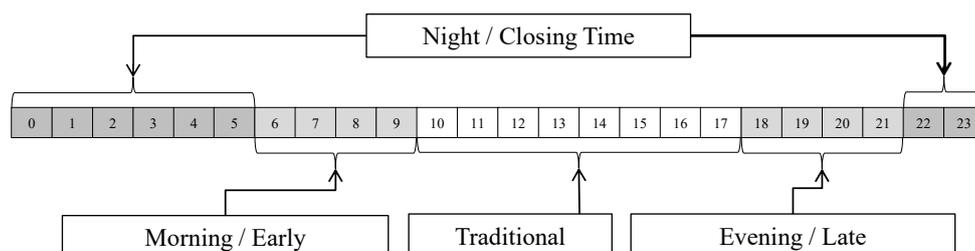


Figure 9.4 Time categories

Applying these categories, the data reveals that the majority of users (49%) visited the platforms during traditional opening hours. At night (8%) and during early morning hours (11%), only few visits were recorded, while 32% of the visitors accessed the platform in the evening (see Table 9.4).

Time	Total	%	P1	%	P2	%	P3	%	P4	%	P5	%
Early	8813	11.3	5655	11.09	1572	12.5	694	11.7	576	10.5	316	11.9
Traditional	37842	48.7	24523	48.08	6337	50.4	3001	50.4	2592	47.1	1389	52.4
Late	24498	31.5	16407	32.17	3729	29.7	1791	30.1	1841	33.5	730	27.5
Night	6532	8.4	4420	8.67	936	7.4	466	7.8	492	8.9	218	8.2

Table 9.4 Overview time categories – product views

To prepare the data for pattern discovery, we assigned each unique entry for page path (as a representation of a product page), distance, time, vendor and product category a numerical value. Table 9.5 shows the resulting data structure.

Session ID	Visitor Country	Visitor City	URL	Date/Time	Platform City	Product Category	Vendor Category	Distance Category	Time Category
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Table 9.5 Final data structure

9.4.4 Pattern Analysis

1) Session dependent Analysis: To identify Long Tail opportunities for LOOROs based on frequently viewed product sets within one session, we conducted a Market Basket Analysis using the Apriori algorithm (Raorane et al., 2012, pp. 22-26). Surprisingly, the algorithm was not able to detect any frequently viewed item sets, even when applying a very low threshold of 1% support and 5% confidence. We therefore looked at the session characteristics and found that the average visitor does not visit more than one product page, also indicated by a very low average session length of only 1.2 page views. Furthermore, we found a high number of direct bounces (84%) (see Table 9.6).

Single page session:	291.964	84.1%
Session 2 to 5 page views	53.145	15.3%
Session 6 to 10 page views	1.760	0.5%
Sessions > 10	296	0.1%

Table 9.6 Session length overview

The average length of sessions including a product view was only 3 (page views), including only one product page view. This clearly shows that LSP visitors do not look around, but instead follow a very focused search strategy and usage pattern. Furthermore, the very short session length indicates a low transaction rate for the platforms, as the shortest path to complete a transaction requires six page views. Only 0.6% of the sessions reach this length and could thus carry a transaction (see Table 9.6).

2) Distance and Time dependent Product Views: For further investigation of the Long Tail opportunities (extension of the catchment area, opening hours and/or demand for digital shelf extensions), we analyzed location and time preferences of LSP visitors, using a multi-dimensional association analysis (Raorane et al., 2012, pp. 22-26). To make sure that the rules that we discovered (using the Apriori algorithm) only represent frequent and important usage patterns, we defined high thresholds as filters: >25% for category support (support based on the distance categories), >15% for confidence, and >1 for lift (Borgelt, 2012, pp. 449-450). Only rules above these thresholds will be part of the following discussion.

Regarding the impact of distance and time on product category views, we identified seven rules, revealing Long Tail potential mainly for Fashion and Home & Garden products. Rules 1, 2, 3 and 6 show that regardless their location, users especially visit Fashion product pages during traditional opening hours (e.g., “Local Customers + Traditional Shopping Time → Fashion Products”). The high lift (8.6) of rule 3 stresses the importance of this pattern. Further, rules 5 and 7 point at preferences of both, users visiting the platforms from online shopping distance in the evening hours and users visiting the platforms from outside the country during traditional opening hours, for Home & Garden product pages. Rule 4 indicates another interesting behavioral pattern, as it shows that local food and beverages are of special interest for LSP visitors from outside the local catchment area and during traditional shopping times.

(Category Support >25%, Confidence >15%, Lift >1)

Antecedent		Consequent					
No.	Distance	Time	Product Category	Support %	Category Support %	Confidence %	Lift
1.	Local	Traditional	Fashion	7.07	48.1	15.2	1.107
2.	Dist. Catchment	Traditional	Fashion	5.19	41.5	16.6	1.209
3.	Online Shopping	Traditional	Fashion	26.3	43.5	11.9	8.627
4.	Online Shopping	Traditional	Local Food	26.3	43.5	20.4	1.101
5.	Online Shopping	Late	Home & Garden	17.8	29.4	16.7	1.160
6.	Foreign Country	Traditional	Fashion	5.84	47.4	16.2	1.174
7.	Foreign Country	Traditional	Home & Garden	5.84	47.4	18	1.250

Table 9.7 Association Rules – distance / time to product category

Regarding the impact of distance and time on the users' vendor preferences, we identified six rules. Rules 1 and 2 point at a book store and jewelry store focus of users, who are accessing the platform from within a local range and during traditional opening hours. As stated in rule 3, users from the Distant Catchment Area tend to look at Jewelry Stores. Further, rules 4, 5 and 6 (rule 6 with a high lift of 8.9) indicate that during traditional shopping times, visitors from online shopping distances or from outside the country mainly look at Electronic Stores.

(Category Support >25%, Confidence >15%, Lift > 1)

Antecedent		Consequent					
No.	Distance	Time	Vendor Category	Support %	Category Support %	Confidence %	Lift
1.	Local	Traditional	Book Store	7.07	48.1	17.5	1.390
2.	Local	Traditional	Jewelry Store	7.07	48.1	15.6	1.210
3.	Distant Catchment	Traditional	Jewelry Store	5.19	41.5	17.2	1.335
4.	Online Shopping	Traditional	Electronics Store	26.3	43.5	22.2	1.103
5.	Online Shopping	Late	Electronics Store	17.8	29.4	22.6	1.120
6.	Foreign Country	Traditional	Electronics Store	5.84	47.4	18	8.929

Table 9.8 Association Rules – distance / time to vendor category

9.5 Discussion & Conclusion

Applying Web Usage and Association Rule Mining, we analyzed the web usage data of five local shopping platforms in Germany. Regarding our first research question, “*Do local shopping platforms in fact help LOOROs to overcome physical and locational disadvantages compared to e-commerce players?*”, our findings show that LSPs do help LOOROs to tackle locational limitations, but do not help them so far to overcome physical limitations (regarding shelf and sales space).

Concerning the limited catchment area of LOOROs, the platforms attract visitors and potential customers from outside the local and the distant catchment area (60% from online shopping distance, 12% from foreign countries) and thus help LOOROs to extend their

market reach. Surprisingly, local visitors (15%) and visitors from within a radius of 50km (13%) account for only a small portion of LSP user traffic. Further, LSPs extend the opening hours of LOOROs into the late evening (32% visitors between 6 pm and 10 pm), but the platforms mainly attract visitors during traditional opening hours so far (49% visitors between 10 am and 6 pm).

Concerning the physical limitations of LOOROs, LSPs at this point do not attract their visitors to browse around on their platforms, to look at various offers of the local vendors, and to discover unknown niche products from the tail of the demand curve. Based on the examination of the session characteristics, our findings indicate a focused search and usage behavior of the visitors. If LSP visitors view a product page at all (average session length 1.2 page views), they mostly look at only one single product. Apparently, users so far access LSPs mainly for shopping preparation, contributing to the “Research Online – Purchase Offline (ROPO) Effect” (also known as webrooming / showrooming) (Nesar and Sabir 2016, pp. 50-51). Accordingly, so far LSPs miss the opportunity to establish an inter-organizational marketplace with digital shelf extensions for local online shopping (local commerce), and instead only act as information hubs with regards to product availability and opening hours.

As to our second research question, “*Do the origins and preferences of LSP visitors offer insights into potential “Long Tail” opportunities for LOOROs?*”, the web usage data revealed several interesting demand patterns, indicating Long Tail opportunities for the expansion of the catchment area and opening hours, but also pointing at demand for digital shelf extensions (see Table 9.7 and 9.8). For example, we found products of Electronic Stores to be mainly visited by users from online distance or even foreign countries (see Table 9.8). Regarding time, the majority of the demand patterns relate to traditional opening hours. Only two of the discovered rules cover the late evening. In conclusion, at this point especially retailers dealing with “Fashion” and “Home & Garden” products seem to benefit from the Long Tail effects of LSPs (e.g., demand from outside the local and distant catchment area and outside traditional opening hours) and thus could learn from the discovered demand patterns. Additionally, they also could benefit from digital shelf extensions provided by LSPs, as Fashion products are characterized by a huge variety in terms of colors, sizes and cuts, and Home & Garden products (like garden furniture) are often bulky, so that locational limitations are of particular relevance for the according retailers and delivery is of special importance for the customers (Anderson, 2008, p. 16).

Practical Implications: Our findings provide valuable insights for both, the owners of LOOROs and the providers of LSPs :

LOOROs: 1) LOOROs can harness LSPs as information and service hubs, improving their online visibility and allowing potential customers to check e.g., on the availability of products. 2) LOOROs should familiarize themselves with the opportunities of the Long Tail and they should analyze the revealed demand patterns to develop targeted LSP sales strategies (Anderson, 2008, p. 4). 3) Furthermore, as shopping frequencies in high streets are declining (IFH, 2016, p. 38), the high numbers of online visitors during traditional opening hours points at the opportunity for LOOROs to establish a live online touch point with their customers (Pantano and Viasonne, 2014, p. 3).

LSPs: 1) Considering the origins of the platform visitors, a self-restriction to serve only local customers seems questionable. Nearly 85% of the users visited the platform from outside the local area and virtual geo fences would thus simply cut down the demand side of the platforms. 2) So far, LSPs fail to keep visitors on their sites. Improved landing page design and the use of recommendation services could help to extend the average session length and duration of visits, leading to a more attractive local online marketplace environment.

Limitations and Future Research: 1) Web usage data captures behavioral patterns and profiles of users along with their clickstream data. However, it offers no insights into the users' perception of the quality of a website and the attractiveness of its products and services. Thus, for deeper insights, transaction data needs to be taken into account. 2) Further, as long as LSPs fail to attract visitors to browse around on the LSPs, association rule (Market Basket) analysis depending on clickstream behavior can only offer very limited insights.

Considering our findings and the limitations of the research approach, we suggest the following areas of future research: 1) Research is needed, that aims at a better understanding of the search behavior of LSPs visitors, as it is so far unknown, why they leave the platforms so quickly. 2) A possible answer could be that they are preparing online for later offline transactions, as suggested by the "ROPO Effect". Of course, LSPs like to put forward this argument in their marketing messages, but so far there is no quantifiable proof of the ROPO effect, as it is very challenging to measure customer journeys across different channels (online / offline) and different devices (IFH, 2016, p. 38). Thus, approaches need to be found that can help measure and proof the ROPO Effect.

10. Conclusion

10.1 Key Findings

The purpose of the present research is to support the suspended business type LOORO towards the challenges of the digital age. Accordingly, this dissertation concludes with the discussion of the key findings of the conducted studies and the answers to the raised overall research questions. Concerning the first research question: “*What is the current state of digitalization of local owner operated retail outlets?*” the results of the main study, conducted among 223 LOOROs from the region of South Westphalia, Germany, show a low digital development (see Figure 10.1). Within the four analyzed business areas (i.e., administration, sales, marketing, and services) of LOOROs, only “Digital Administration” comprises noteworthy activities (see chapter 3, 4, 5 and 6). In all other business areas LOOROs remain mainly inactive. The low state of digitalization among LOOROs mirrors the overall visible negative development of the suspended business type LOORO on the retail market. The owners of the local retail outlets are hesitating to implement digital tools and applications for their business. Accordingly, they are far behind the digital development of their competitors (HDE, 2017, p. 9) and disconnected to the digital expectations of their customers (IFH, 2016, p. 38).

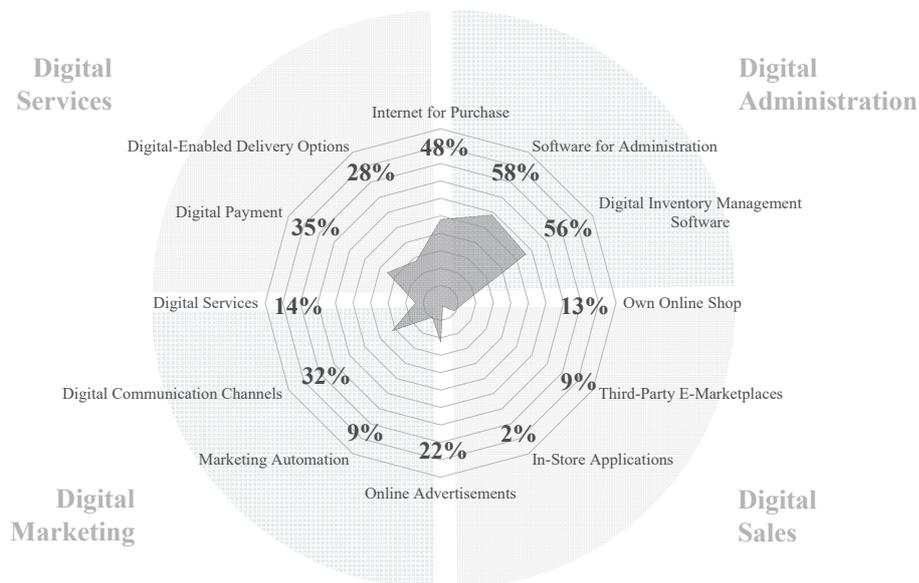


Figure 10.1 Current State of Digitalization of LOOROs in the Region of South Westphalia

The results of the conducted studies offer reasonable explanations for this passive behavior: LOOROs have a substantial lack of financial, organizational (e.g., staff time and know how) and infrastructural (e.g., capacities, storage) resources to implement the tools and services of

the digitalization. Furthermore, the results highlight that even if LOOROs would have all necessary resources, they are additionally facing an intense phase of uncertainty. LOOROs do not know in which technology or application to invest. Combined, both circumstances (i.e., lack of resources and uncertainty) are leading towards the harmful wait and hold attitude that cements the vicious circle of sales and services offers that do not longer match the current market standards and the customer expectations. Subsequently, the passive behavior of LOOROs leads to an ongoing loss of market share and competitive power (see chapter 3, 4, 5 and 6).

However, LOOROs are not defenselessly exposed to the threats of the digital age: Digital tools and applications allow them to overcome their inherent limitations (Navickas et al., 2015, p. 4). Additionally, the use of integrated digital infrastructures that enhance locational advantages in the digital world, enable LOOROs to regain competitive power (Li et al., 2016, p. 28; Navickas et al., 2015, p. 4). Accordingly, the findings to the second overall research question: *“What are possible options for actions for local owner operated retail outlets to regain competitive power and to survive in the digital future?”* are of high value for LOOROs and can have impact on their future development. The results of the conducted studies indicate that the current low state of digital development among LOOROs can also be an opportunity. The overall low state indicates that already rather small measures will have a positive impact. But, to make use of this opportunity LOOROs will have to change their passive work culture (see chapter 5) and need develop and implement digital tools and applications to support their business processes (see chapter 4). LOOROs need to seek the use of current technologies and utilize them to overcome their inherent limitations (e.g., lack of time, adequate knowledge, human resources, capacities, finances, etc.) for example with the help of marketing automation or channel integration (see chapter 4, 5 and 6). The use of digital tools and applications for backend activities of the stores (e.g., digital inventory management systems and order management systems) are most preferred by LOOROs and according to the conducted studies a suitable start towards digitalization. However, also the use of digital sales channels (via own online shops or third-party e-marketplaces) can push the digital development of LOOROs in all other business areas and is therefore an alternative starting point, too (see chapter 5). Especially, the underdevelopment of the physical sales areas of the local shops is uncharted territory and offer LOOROs a chance to increase their strength (e.g., touch and feel of products, face to face contact and interaction with the customers) by improving and extending the local retail shopping experience through digital tools, applications and services (e.g., location-based services, same day delivery and in-store recommender systems) (see chapter 4, 5 and 6). The implementation of an in-store analytics

infrastructure could be a foundation for the successful implementation of the already mentioned backend and frontend measures. Furthermore, in-store analytics could offer LOOROs the chance to learn from the actual store performance data and show a path to continuous offline improvements (comparable with the improvements based on web analytics in the online realm) and subsequently to the implementation of advanced digital services (see chapter 7).

The results of the given studies show clearly that LOOROs are already overstrained with the implementation of basic technologies and therefore, all so far mentioned tools, applications and measures are mainly targeting the rare case of digitally advanced LOOROs. However, the discussed findings of the given studies, especially the results of the specialization area, offer also measures for less advanced LOOROs and give the following suggestions for online visibility, the use of e-intermediaries and e-marketplaces and local shopping platforms on how to start a low barrier entry into the digitalization.

1) Online visibility: Nowadays online visibility, namely the ranking in the most favorable search engines is of great importance for online and for offline retailers (Malaga, 2007, p. 79). Also LOOROs have to face this reality. LOOROs need to have an own web presence, either with the help of a digital service e.g., “Google MyBusiness” or “Bing Places” or even better with an own website (Malaga, 2007, p. 80). Subsequently, LOOROs with web presence need to start with basic measures of search engine optimization (SEO) and the implementation of local link building strategies to compete with the big platforms and networks (see chapter 8).

2) The use of e-intermediaries and e-marketplaces: To jump start the digitalization without the need of programming and administration skills as well as IT infrastructures in the first place, LOOROs should intensify the use of e-intermediaries and e-marketplaces to extend their business model (see chapter 8 and 9). However, LOOROs should not passively depend on the traffic generated by the e-intermediaries and marketplaces and ignore their own customers as shown in the results of the study given in chapter 8. LOOROs actively need to link their own customers to the new digital touchpoints (e.g., eBay, amazon or a local shopping platform) of their stores e.g., via hyperlinks and / or online advertisements.

3) Local shopping Platforms: This special form of e-marketplaces is the currently buzzing in Germany. However, the results of chapter 9 show, despite the immature marketplace development (visitors are not browsing through the local shopping platforms) that these platforms can be helpful to extend the catchment area of LOOROs. Accordingly, LSPs can help to expand the possible customer base of LOOROs. They offer LOOROs and their

customers an online product catalogue and a digital infrastructure with a local focus. This could help LOOROs to reverse the trend of only losing customers to digital competitors and be a start to regain old customers and to convince new ones.

However, despite all opportunities, the results of the studies show that it seems unlikely that suspended business types like LOOROs can independently overcome their manifold barriers to recover (chapter 3, 4, 5, 6 and 8). LOOROs will (additionally to own activities) depend on external support to adapt to the digital development of their competitors as well as their customers (see chapter 6). Accordingly, also the public sector needs to take actions to foster the digital development of LOOROs from the outside. Based on our findings, a carrot-and-stick approach on three levels is promising:

1) Information & Sensitization: LOOROs need to be reconnected to their near environment (customers, competition); information and sensitization campaigns about the digital developments in terms of tools and applications, industry standards, customer needs and habits are necessary to ensure that services provided by the LOOROs correspond to the competitive environment and the customer expectations.

2) Collaboration & Support: LOOROs rely on outside help to overcome their limitations (time, capacities) to be able to digitalize the business. Funding for collaboration platforms and infrastructures (e.g., local shopping platform) as well as for shared services (e.g., implementation, maintenance support for online shops and inventory management systems) could encourage the collaboration among industry partners and competitors.

3) Legal Regulations: Finally LOOROs are receptive for legal regulations. Regulations can steer LOOROs towards the use of digital tools and applications and reduce the administrative burden. Possible starting points could be legal requirements with regards to digital cashier systems (including inventory management and interfaces to online shops and third-party e-marketplaces).

10.2 Future Research

While this dissertation had an intense focus on the current state of digitalization of local owner operated retail outlets and the digital transformation of the local retail sector, it always keeps a realistic point of view with regards to the abilities and limitations of its main target group, the owners of LOOROs. However, for further research it might be meaningful to leave this narrow focus and to analyze the realm of opportunities without consideration of internal and external boundaries. Accordingly, the following topics and areas could be valuable for future research on how to improve the future prospects of the local retail sector in the near digital age.

1) Digital Administration: To improve the performance of the digital backend activities of LOOROs, further research on system and channel integration is necessary (Enders and Jelassi, 2000, pp. 544-446). So far, there is no sufficient “Omnichannel Backend” for small retail outlets, which is combining full functionality and ease of use. Especially for stationary retailers such systems would be valuable, as it is decisive for them to catch up with the analytics and service level of their online competitors. Anyway, system integration can just be the first step in this development. Additional research is necessary on internal process automation on the one hand, and on process automation along the value chain on the other (Korsgaard et al., 2015, p. 5; Andreu et al., 2010, pp. 246-249; Geer and Lei, 2012, p. 70).

2) Digital Sales Channels: Especially the digitalization of the physical sales areas is neglected by the retailers (see chapter 3, 4, 5 and 6). However, this uncharted territory opens at the same time a huge realm of possible future directions on how to improve e.g., the live shopping experience of local retail customers (Pantano and Viasonne, 2014, p. 3; Pantano, 2014, p. 6). Starting with recommender systems which could guide the shoppers through the store or even the entire city, followed by advanced product presentation and information systems that could help to overcome the limitations of LOOROs (e.g., using Augmented Reality or even Virtual Reality instead of staff), to finally, the opportunity to implement responsive store environments (Pantano, 2014, p. 6). Accordingly, once connected to the devices of the customers, e.g., smartphones, wearables or other Internet of Things (IoT) devices, could intensify the shopping experience through context-aware services like digital guided shopping tours.

3) Digital Marketing: Currently, one of the main challenges for digital marketing is to keep track of the target group in a cross channel trade environment (Wagner, 2015 p. 130). Customers switch channels and devices and thus it is difficult to identify the right time and

the right place (channel) for advertisements and incentives (Schramm-Klein et al., 2011, p. 8). Accordingly, research is needed on cross-channel / cross-device customer tracking to help marketers to develop cross-channel marketing measures and strategies. Furthermore, this tracking is needed to find back to clear marketing performance indicators to solve the cross-channel attribution problem (answering the questions, which measure was successful, which one was not). A working cross-channel / cross-device tracking could also help research on the so far unquantified shopping phenomenon called the “Research Online - Purchase Offline Effect” (Nesar and Bin Sabir, 2016, pp. 50-51).

4) Digital Services: Today the importance of digital and non-digital services is unquestioned. After decades of developments towards self-service, do-it-yourself and convenience stores, we encounter the return of the full-service providers (from digital supported personal consultation to extremely fast delivery and set up) in the digital world (Pantano and Viasonne, 2014, p. 3; Pantano, 2014, p. 6). Accordingly, also the realm of personalized in-store services and digital-enabled logistics services (e.g., same hour / same day delivery) is growing fast and deserves more attention. Research on service offers (e.g., in-store pick up, click & reserve, in-store ordering, ship-from-store and many more) and their implementation is needed and could add real value to the development of the local retail sector (Pantano and Viasonne, 2014, p. 3; Pantano, 2014, p. 6; Galbraith, 2017, p. 19).

5) Local Cooperation: Last but not least, research and pilot projects with regards to the cooperation of local vendors and competitors (on city level) could help the suspended business type LOOROs to overcome their inherent limitations and get ready for the digital future (Grewal et al., 2017, pp. 4-5) (see chapter 6).

10.3 Limitations

Next to all limitations mentioned in the conducted studies, the main challenge of this dissertation was doing research on a highly inactive and passive target group. Despite all efforts to analyze and understand the challenges and opportunities of LOOROs, this passive behavior will always limit the explanatory power of this research. It is one part to describe the current (passive) state of digital development, but it is a completely different and extremely fault-prone venture to draw conclusion for the future development of the local retail sector based on the passive behavior of LOOROs.

“It's tough to make predictions, especially about the future.”

Lawrence Peter "Yogi" Berra

10.4 Final Thoughts

While looking back on eight studies concerning the current state of digital and non-digital development of local owner operated retail outlets in the region of South Westphalia, their faced challenges and (often unexploited) opportunities, it became of particular concern to the author to say, that the in the very beginning abstract and distant theoretical analysis has become very close and personal. In the last three years, the local owner operated retailers from the region of South Westphalia as well as the other local commerce stakeholders have first become faces and names and then sometimes even friends. It was impressive to meet so many strong and self-made personalities, most of the time with an intense passion for the business they are doing. Therefore, I would like to close this dissertation with the following:

The one asset the digitalization can never replace is the human contact, the personal relationships built on social interactions and exchange. Despite all upcoming and already existing digital and non-digital challenges for local owner operated retail outlets, this is the one unique selling proposition the owners and managers of LOOROs will never lose - their individual personalities. However, it is time to implement this asset into a new vision. The local retailers have to move their boundaries and to overcome their own limitations. It is time to reinvent the existing business models as well as the role of the owners / managers themselves to get ready for the digital now.

“It always seems impossible until it's done.”

Nelson Mandela

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Appendix

Appendix 1

Questionnaire Pilot Study

Mark as shown: Please use a ball-point pen or a thin felt tip. This form will be processed automatically.

 Correction: Please follow the examples shown on the left hand side to help optimize the reading results.

1. Händler Informationen

1.1 Ist Ihr Unternehmen Teil einer überregionalen Handelskette, Einkaufsgemeinschaft oder Franchisenehmer? Ja Nein

1.2 In welchen Sparten / Branchen ist Ihr Unternehmen tätig?

- | | | |
|--|---|---|
| <input type="checkbox"/> Lebensmittel | <input type="checkbox"/> Apotheken | <input type="checkbox"/> Textilien, Bekleidung, Schuhe und Lederwaren |
| <input type="checkbox"/> Metallwaren, Bau- und Heimwerkerbedarf | <input type="checkbox"/> Informations- und Komm.-technik | <input type="checkbox"/> Nahrungs- / Genussmittel, Getränke, Tabakwaren |
| <input type="checkbox"/> Drogerien, Parfümerien, medizinischer Bedarf | <input type="checkbox"/> Spielwaren | <input type="checkbox"/> Elektrische Haushaltsgeräte |
| <input type="checkbox"/> Papier, Bücher, Zeitschriften, Zeitungen, Bild und Tonträger | <input type="checkbox"/> Blumen, Pflanzen, Tiere | <input type="checkbox"/> Sportartikel, Fahrräder und Camping |
| <input type="checkbox"/> Sonstiger Einzelhandel | <input type="checkbox"/> Uhren, Schmuck | <input type="checkbox"/> Augenoptiker |
| <input type="checkbox"/> Kunstgegenstände, Bilder, Briefmarken, Münzen und Geschenkartikel | <input type="checkbox"/> Vorhänge, Teppiche, Fußbodenbeläge und Tapeten | <input type="checkbox"/> Antiquitäten, Gebrauchtwaren, Antiquariate |
| <input type="checkbox"/> Fotofachhandel | | |

1.3 In welchem Jahr wurde Ihr Unternehmen gegründet?

An welche Art von Kunden richtet sich Ihr Angebot?

	Sehr stark	Stark	Teils teils	Schwach	Sehr schwach	Weiß nicht
1.4 Privatkunden	<input type="checkbox"/>					
1.5 Unternehmen	<input type="checkbox"/>					

Welche Eigenschaften haben die von Ihnen verkauften Produkte?

	Sehr stark	Stark	Teils teils	Schwach	Sehr schwach	Weiß nicht
1.6 Massenproduktion	<input type="checkbox"/>					
1.7 Serienproduktion	<input type="checkbox"/>					
1.8 Einzelfertigung	<input type="checkbox"/>					
1.9 Nischenproduktion	<input type="checkbox"/>					

1. Händler Informationen [Continue]

Wie viele Mitarbeiter sind in Ihrem Unternehmen beschäftigt (inklusive Geschäftsführung)?

1.10 Vollzeit

1.11 Teilzeit

1.12 Geringfügige Beschäftigung

Wie würden Sie ihre Personalsituation zu den folgenden Faktoren einschätzen?

	Sehr gut	Gut	Teils teils	Schlecht	Sehr schlecht	Weiß nicht
1.13 Digitale Kompetenz	<input type="checkbox"/>					
1.14 Ausreichend Personal zur Umsetzung von Digitalisierungsstrategien	<input type="checkbox"/>					
1.15 Bereitschaft mit digitalen Anwendungen zu arbeiten	<input type="checkbox"/>					

2. Unternehmer

2.1 **Wie alt sind Sie?**

18 - 29 Jahre

30 - 39 Jahre

40 - 49 Jahre

50 - 59 Jahre

60 und älter

2.2 **Ist die Unternehmensnachfolge gesichert?**

Ja

Nein

Noch kein Thema

2.3 **Wie waren Ihre Erfahrungen mit der Digitalisierung Ihres Unternehmens in der Vergangenheit?**

Sehr gut

Sehr schlecht

Weiß nicht

2.4 **Sehen Sie Ihr Unternehmen gut aufgestellt für die Herausforderungen der Digitalisierung?**

Sehr gut

Sehr schlecht

Weiß nicht

2.5 **Wie schätzen Sie Ihre persönlichen Kompetenzen in Fragen der Digitalisierung ein?**

Sehr gut

Sehr schlecht

Weiß nicht

2.6 **Welche Bedeutung glauben Sie, wird die Digitalisierung für Ihr Unternehmen in Zukunft haben?**

Sehr hoch

Sehr niedrig

Weiß nicht

3. Wirtschaftliche Situation

3.1 **Wie ist die wirtschaftliche Situation Ihres Unternehmens?**

Sehr gut

Sehr schlecht

Weiß nicht

3.2 **Wie wird sich die wirtschaftliche Situation in den nächsten 5 Jahren voraussichtlich entwickeln?**

Sehr gut

Sehr schlecht

Weiß nicht

3.3 **Wie hat sich die wirtschaftliche Situation in den letzten 5 Jahren entwickelt?**

Sehr gut

Sehr schlecht

Weiß nicht

3.4 **Wie gut ist es für Ihr Unternehmen zukünftig möglich, Investitionen für die Digitalisierung zu leisten?**

Sehr gut

Sehr schlecht

Weiß nicht

4. Wettbewerb

- | | | | | | | | | | | |
|-----|--|------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------|--------------------------|------------|
| 4.1 | Wie stark nehmen Sie den Konkurrenzdruck auf dem Markt wahr? | Sehr stark | <input type="checkbox"/> | Sehr schwach | <input type="checkbox"/> | Weiß nicht |
| 4.2 | Wie ist der Konkurrenzdruck im lokalen Wettbewerb? | Sehr stark | <input type="checkbox"/> | Sehr schwach | <input type="checkbox"/> | Weiß nicht |
| 4.3 | Wie ist der Konkurrenzdruck mit dem Online-Handel? | Sehr stark | <input type="checkbox"/> | Sehr schwach | <input type="checkbox"/> | Weiß nicht |
| 4.4 | Wie stark beobachten Sie Ihre lokalen Mitbewerber? | Sehr stark | <input type="checkbox"/> | Sehr schwach | <input type="checkbox"/> | Weiß nicht |

Wie beschreiben Sie die Qualitäten Ihrer lokalen Mitbewerber auf den folgenden Gebieten?

- | | | | | | | | |
|-----|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| | | Sehr stark | Stark | Mittel | Schwach | Sehr schwach | Wei nicht |
| 4.5 | Internetauftritt | <input type="checkbox"/> |
| 4.6 | Grad der Digitalisierung | <input type="checkbox"/> |
| 4.7 | Innovationen | <input type="checkbox"/> |
| 4.8 | Wie stark beobachten Sie Ihre Mitbewerber im Online-Handel? | Sehr stark | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sehr schwach <input type="checkbox"/> Wei nicht |

Wie beschreiben Sie die Qualitäten Ihrer Mitbewerber im Online-Handel auf den folgenden Gebieten?

- | | | | | | | | |
|------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| | | Sehr stark | Stark | Mittel | Schwach | Sehr schwach | Wei nicht |
| 4.9 | Internetauftritt | <input type="checkbox"/> |
| 4.10 | Grad der Digitalisierung | <input type="checkbox"/> |
| 4.11 | Innovationen | <input type="checkbox"/> |
| 4.12 | Wie hufig haben Sie schon Innovationen oder Ablufe von Konkurrenten bernommen? | Sehr hufig | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | berhaupt nicht <input type="checkbox"/> Wei nicht |
| 4.13 | Wie hufig haben Konkurrenten schon Innovationen oder Ablufe von Ihnen bernommen? | Sehr hufig | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | berhaupt nicht <input type="checkbox"/> Wei nicht |

Wandern Kunden ab zu...?

- | | | | | | | | |
|------|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | Sehr stark | Stark | Mittel | Schwach | Sehr Schwach | Wei nicht |
| 4.14 | Lokalen Mitbewerbern | <input type="checkbox"/> |
| 4.15 | Online Handel | <input type="checkbox"/> |

5. Zulieferer / Lieferanten

5.1 Wie viele Lieferanten / Zulieferer haben Sie?

5.2 Wie gut ist Ihr berblick ber potenzielle Lieferanten? Sehr gut Sehr schlecht Wei nicht

5. Zulieferer / Lieferanten [Continue]

- 5.3 **Wie häufig nutzen Sie das Internet, um potenzielle Lieferanten zu finden?** Sehr häufig Überhaupt nicht Weiß nicht
- 5.4 **Wie häufig nutzen Sie das Internet, um Preisvergleiche durchzuführen?** Sehr häufig Überhaupt nicht Weiß nicht

Welche Art von Seiten nutzen Sie zum Preisvergleich?

- | | Sehr häufig | Häufig | Gelegentlich | Selten | Überhaupt nicht | Weiß nicht |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5.5 Suchmaschinen | <input type="checkbox"/> |
| 5.6 Websites von Einzelhändlern | <input type="checkbox"/> |
| 5.7 Preisvergleichsseiten | <input type="checkbox"/> |
| 5.8 Auktions-Websites | <input type="checkbox"/> |
| 5.9 Hersteller-Websites | <input type="checkbox"/> |
| 5.10 Verbraucher-Websites | <input type="checkbox"/> |
| 5.11 Websites professioneller Kritiker | <input type="checkbox"/> |
| 5.12 Foren | <input type="checkbox"/> |
| 5.13 Videoportale | <input type="checkbox"/> |
| 5.14 Blogs | <input type="checkbox"/> |
| 5.15 Soziale Netzwerke | <input type="checkbox"/> |
| 5.16 E-Mail Newsletter | <input type="checkbox"/> |

- 5.17 **Wie stark sind Sie Ihren bestehenden Lieferanten treu verbunden?** Sehr stark Sehr schwach Weiß nicht

Welche Kriterien würden Sie dazu veranlassen, Ihre Lieferanten zu wechseln?

- | | Sehr stark | Stark | Mittel | Schwach | Sehr schwach | Weiß nicht |
|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5.18 Preis | <input type="checkbox"/> |
| 5.19 Service | <input type="checkbox"/> |
| 5.20 Lieferzeit | <input type="checkbox"/> |
| 5.21 Qualität | <input type="checkbox"/> |
| 5.22 Zuverlässigkeit | <input type="checkbox"/> |
| 5.23 Standort | <input type="checkbox"/> |
| 5.24 Sortiment | <input type="checkbox"/> |
| 5.25 Online Service | <input type="checkbox"/> |

- 5.26 **Verlangen Lieferanten von Ihnen, bestimmte digitale Infratstrukturen vorzuhalten (z.B. Internet - nur online Bestellung, Scanner Technik)?** Sehr stark Sehr schwach Weiß nicht

- 5.27 **Bieten Lieferanten Ihnen die Mitnutzung von digitalen Infrastrukturen an? (Equipment, Software)** Sehr stark Sehr schwach Weiß nicht

6. Staat / Stadtentwicklung

- 6.1 Wie häufig haben Sie schon Förderungen vom Staat (EU, Bund, Land, Kommune) in Anspruch genommen? Sehr häufig Überhaupt nicht Weiß nicht
- 6.2 Wie gut ist Ihr Überblick über die bestehenden Förderungen vom Staat (EU, Bund, Land, Kommune)? Sehr gut Sehr schlecht Weiß nicht
- 6.3 Welche der folgenden lokalen Kooperationsprojekte kennen Sie?
 OnlineCity Wuppertal Schaufenster Köln / Bonn OnlineCity Metzingen
- 6.4 Wie aktiv sind Ihrer Meinung nach die städtischen Gremien (Stadt, Wirtschaftsförderung, Interessensvertreter) zum Thema Digitalisierung? Sehr aktiv Sehr passiv Weiß nicht

7. Kunden

- 7.1 Wie hat sich die Kundenfrequenz in Ihrem Geschäft in den letzten 5 Jahren entwickelt? Stark zugenommen Stark abgenommen Weiß nicht
- 7.2 Wie hat sich die Kaufkraft pro Kunde entwickelt? Stark zugenommen Stark abgenommen Weiß nicht
- 7.3 Wie hat sich die Anzahl der kaufenden Kunden im Verhältnis zu Kundenbesuchen im Ladenlokal entwickelt? Stark zugenommen Stark abgenommen Weiß nicht
- 7.4 Wie häufig nehmen Sie wahr, dass Ihre Kunden digitale Anwendungen begleitend zum Einkauf bei Ihnen nutzen? Sehr häufig Überhaupt nicht Weiß nicht
- 7.5 Wie stark erwarten Ihre Kunden von Ihnen digitale Service Angebote (z.B. Onlineshop, Apps, Internetseite)? Sehr stark Sehr schwach Weiß nicht

Wie ist die Nachfrage bei Ihren Kunden nach folgenden Angeboten?

- | | Sehr stark | Stark | Mittel | Schwach | Sehr schwach | Weiß nicht |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 7.6 Internetseite | <input type="checkbox"/> |
| 7.7 Onlineshop | <input type="checkbox"/> |
| 7.8 Email Beratung | <input type="checkbox"/> |
| 7.9 Apps | <input type="checkbox"/> |
| 7.10 Kundenkarten | <input type="checkbox"/> |
| 7.11 Preisvergleiche mit anderen Händlern | <input type="checkbox"/> |
| 7.12 Erfahrungen mit den Produkten | <input type="checkbox"/> |
| 7.13 Produktbewertungen | <input type="checkbox"/> |
| 7.14 Lieferung nach Hause | <input type="checkbox"/> |
| 7.15 Online bestellen - im Shop abholen | <input type="checkbox"/> |
| 7.16 Individuelle Gestaltung der Produkte | <input type="checkbox"/> |

8. Aufwand

- | | | | | | | | | | | |
|-----|---|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------|--------------------------|------------|
| 8.1 | Wie hoch schätzen Sie den Aufwand für die Einführung und Unterhaltung von digitalen Services ein? | Sehr hoch | <input type="checkbox"/> | Sehr niedrig | <input type="checkbox"/> | Weiß nicht |
| 8.2 | Wie hoch schätzen Sie den Aufwand zur Weiterbildung von Ihnen und Ihren Mitarbeitern ein, um digitale Angebote einzuführen und zu unterhalten? | Sehr hoch | <input type="checkbox"/> | Sehr niedrig | <input type="checkbox"/> | Weiß nicht |
| 8.3 | Wie hoch schätzen Sie den Aufwand zur Weiterbildung von Ihnen und Ihren Mitarbeitern ein, um digitale Angebote einzuführen und zu unterhalten? | Sehr hoch | <input type="checkbox"/> | Sehr niedrig | <input type="checkbox"/> | Weiß nicht |

9. Positive und Negative Eigenschaften der Digitalisierung

Welche Meinung haben Sie zu den folgenden Aussagen über die Digitalisierung des Handels?
 Digitalisierung...

- | | | <i>Stimme voll zu</i> | <i>Stimme eher zu</i> | <i>Weder noch</i> | <i>Stimme eher nicht zu</i> | <i>Stimme überhaupt nicht zu</i> | <i>Weiß nicht</i> |
|------|--|--------------------------|--------------------------|--------------------------|-----------------------------|----------------------------------|--------------------------|
| 9.1 | ... ermöglicht schnellere Reaktionszeiten durch digitale Kommunikation z.B. Email und Chat. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.2 | ... verursacht zuviel ungewollte Kommunikation z.B. durch Spam-E-mails. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.3 | ... verringert die Kosten, um mit Kunden in Kontakt zu treten. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.4 | ... reduziert die Möglichkeiten, eine persönliche Beziehung zu Kunden aufzubauen. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.5 | ... verringert durch bargeldlose Zahlungsmethoden Probleme mit Diebstahl und Unterschlagung. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.6 | ... öffnet Online Betrug (Cybercrime) Tür und Tor. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.7 | ... macht es schwierig, den Datenschutz sicher zustellen. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.8 | ... birgt durch komplizierte Gesetze (z.B. zum Impressum oder zu Links) sehr viele Unabwägbarkeiten. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.9 | ... ermöglicht, die Anzahl der Verkäufe zu steigern. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.10 | ... ermöglicht, die Kunden besser an das Unternehmen zu binden. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.11 | ... bedarf hoher Investitionskosten, um Online Aktivitäten aufzubauen. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.12 | ... erzeugt hohe laufende Kosten, um Online Aktivitäten aufrecht zu erhalten. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.13 | ... ermöglicht eine bessere Marktübersicht über Lieferanten und Hersteller. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

9. Positive und Negative Eigenschaften der Digitalisierung [Continue]

	Stimme voll zu	Stimme eher zu	Weder noch	Stimme eher nicht zu	Stimme überhaupt nicht zu	Weiß nicht
9.14 ... ermöglicht bessere Kooperationsmöglichkeiten mit Lieferanten und Herstellern.	<input type="checkbox"/>	<input type="checkbox"/>				
9.15 ... erzeugt höheren Konkurrenzdruck durch Preisvergleichbarkeit.	<input type="checkbox"/>	<input type="checkbox"/>				
9.16 ... erzeugt Phänomene wie Beratungsklau (Beratung im Laden, dann online einkaufen).	<input type="checkbox"/>	<input type="checkbox"/>				

10. Aufwand / Akzeptanz / Nutzung / Absicht -1

Wie schätzen Sie die folgenden Faktoren von E-Mails zur Unternehmenskommunikation für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.1 den Aufwand zur Einführung	<input type="checkbox"/>					
10.2 den Nutzen (allgemein)	<input type="checkbox"/>					
10.3 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.4 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.5 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Videotelefonie zur Unternehmenskommunikation für Ihr Geschäft ein?

10.6 den Aufwand zur Einführung	<input type="checkbox"/>					
10.7 den Nutzen (allgemein)	<input type="checkbox"/>					
10.8 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.9 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.10 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von EC und Kreditkartenzahlung für Ihr Geschäft ein?

10.11 den Aufwand zur Einführung	<input type="checkbox"/>					
10.12 den Nutzen (allgemein)	<input type="checkbox"/>					
10.13 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.14 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.15 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Zahlung per Smartphone (mobile wallet, NFC) für Ihr Geschäft ein?

10.16 den Aufwand zur Einführung	<input type="checkbox"/>					
10.17 den Nutzen (allgemein)	<input type="checkbox"/>					
10.18 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.19 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.20 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

10. Aufwand / Akzeptanz / Nutzung / Absicht -1

[Continue]

Wie schätzen Sie die folgenden Faktoren von Zahlung per digitalem Konto (digital wallet, z.B. Paypal) für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.21den Aufwand zur Einführung	<input type="checkbox"/>					
10.22den Nutzen (allgemein)	<input type="checkbox"/>					
10.23die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.24die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.25die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Zahlung per digitaler Währung (z.B. BitCoin) für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.26den Aufwand zur Einführung	<input type="checkbox"/>					
10.27den Nutzen (allgemein)	<input type="checkbox"/>					
10.28die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.29die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.30die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren einer App mit Service (Beratung oder Verkauf) für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.31den Aufwand zur Einführung	<input type="checkbox"/>					
10.32den Nutzen (allgemein)	<input type="checkbox"/>					
10.33die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.34die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.35die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren einer Internetseite für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.36den Aufwand zur Einführung	<input type="checkbox"/>					
10.37den Nutzen (allgemein)	<input type="checkbox"/>					
10.38die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.39die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.40die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren eines Onlineshops für ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.41den Aufwand zur Einführung	<input type="checkbox"/>					
10.42den Nutzen (allgemein)	<input type="checkbox"/>					
10.43die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.44die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.45die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren eines Shops auf einer Drittanbieterplattform (z.B. Ebayshop) für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.46den Aufwand zur Einführung	<input type="checkbox"/>					
10.47den Nutzen (allgemein)	<input type="checkbox"/>					
10.48die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.49die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.50die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

10. Aufwand / Akzeptanz / Nutzung / Absicht -1

[Continue]

10.51 Welche Drittanbieterplattform setzen Sie ein?

- | | | |
|---------------------------------|---|-------------------------------------|
| <input type="checkbox"/> Amazon | <input type="checkbox"/> eBay / eBayKleinanzeigen | <input type="checkbox"/> Dawanda |
| <input type="checkbox"/> Yatego | <input type="checkbox"/> MeinPaket | <input type="checkbox"/> Hitmeister |
| <input type="checkbox"/> Hood | <input type="checkbox"/> Gimahot | <input type="checkbox"/> Gimahot |
| <input type="checkbox"/> Etsy | | |

Wie schätzen Sie die folgenden Faktoren eines Beitritts in eine Online-Einkaufsgemeinschaft für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.52 den Aufwand zur Einführung	<input type="checkbox"/>					
10.53 den Nutzen (allgemein)	<input type="checkbox"/>					
10.54 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.55 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.56 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren einer Inanspruchnahme eines E-Procurement Services für Ihr Geschäft ein?

10.57 den Aufwand zur Einführung	<input type="checkbox"/>					
10.58 den Nutzen (allgemein)	<input type="checkbox"/>					
10.59 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.60 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.61 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Online Werbung für Ihr Geschäft ein?

10.62 den Aufwand zur Einführung	<input type="checkbox"/>					
10.63 den Nutzen (allgemein)	<input type="checkbox"/>					
10.64 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.65 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
10.66 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Schalten Sie...

	Sehr häufig	Häufig	Gelegentlich	Selten	Überhaupt nicht	Weiß nicht
10.67 Suchmaschinen-Werbung	<input type="checkbox"/>					
10.68 Banner-Werbung	<input type="checkbox"/>					
10.69 Werbung auf Videoportalen	<input type="checkbox"/>					
10.70 Werbung auf Sozialen Medien	<input type="checkbox"/>					

10.71 Nennen Sie die Social Media Anbieter, die Sie zur Unternehmenskommunikation verwenden:

- | | | |
|---|------------------------------------|------------------------------------|
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Twitter | <input type="checkbox"/> Google+ |
| <input type="checkbox"/> Pinterest | <input type="checkbox"/> Instagram | <input type="checkbox"/> Youtube |
| <input type="checkbox"/> Xing | <input type="checkbox"/> LinkedIn | <input type="checkbox"/> Wordpress |
| <input type="checkbox"/> Google blogger | <input type="checkbox"/> Tumbler | <input type="checkbox"/> Flickr |
| <input type="checkbox"/> Sonstige | | |

10. Aufwand / Akzeptanz / Nutzung / Absicht -1

[Continue]

Wie schätzen Sie die folgenden Faktoren der Verwendung von Sozialen Netzwerken zur Unternehmenskommunikation für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
10.72 den Aufwand zur Einführung	<input type="checkbox"/>					
10.73 den Nutzen (allgemein)	<input type="checkbox"/>					
10.74 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
10.75 die Absicht zur zukünftigen Nutzung	<input type="checkbox"/>					
10.76 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

11. Aufwand / Akzeptanz / Nutzung / Absicht-2

Wie schätzen Sie die folgenden Faktoren eines Warenwirtschaftssystems für Ihr Geschäft ein?

11.1 den Aufwand zur Einführung	<input type="checkbox"/>					
11.2 den Nutzen (allgemein)	<input type="checkbox"/>					
11.3 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.4 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.5 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren der Verwendung Kundenkarten für Ihr Geschäft ein?

11.6 den Aufwand zur Einführung	<input type="checkbox"/>					
11.7 den Nutzen (allgemein)	<input type="checkbox"/>					
11.8 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.9 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.10 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren der Einbindung von Kunden in Entscheidungen über Ihr Produktangebot für Ihr Geschäft ein?

11.11 den Aufwand zur Einführung	<input type="checkbox"/>					
11.12 den Nutzen (allgemein)	<input type="checkbox"/>					
11.13 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.14 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.15 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren der Vernetzung mit Ihren Lieferanten und Herstellern (z.B. Einblick in die Lagebestände) für Ihr Geschäft ein?

11.16 den Aufwand zur Einführung	<input type="checkbox"/>					
11.17 den Nutzen (allgemein)	<input type="checkbox"/>					
11.18 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.19 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.20 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von direkten Bestellungen bei Herstellern (nicht beim Großhandel) für Ihr Geschäft ein?

11.21 den Aufwand zur Einführung	<input type="checkbox"/>					
11.22 den Nutzen (allgemein)	<input type="checkbox"/>					
11.23 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.24 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.25 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

11. Aufwand / Akzeptanz / Nutzung / Absicht-2 [Continue]

Wie schätzen Sie die folgenden Faktoren von Bestell-Kooperationen auf lokaler Ebene für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
11.26 den Aufwand zur Einführung	<input type="checkbox"/>					
11.27 den Nutzen (allgemein)	<input type="checkbox"/>					
11.28 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.29 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.30 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Werbe-Kooperationen auf lokaler Ebene für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
11.31 den Aufwand zur Einführung	<input type="checkbox"/>					
11.32 den Nutzen (allgemein)	<input type="checkbox"/>					
11.33 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.34 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.35 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Onlineshop-Kooperationen auf lokaler Ebene für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
11.36 den Aufwand zur Einführung	<input type="checkbox"/>					
11.37 den Nutzen (allgemein)	<input type="checkbox"/>					
11.38 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.39 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.40 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Wie schätzen Sie die folgenden Faktoren von Liefer-Kooperationen auf lokaler Ebene für Ihr Geschäft ein?

	Sehr hoch	Hoch	Mittel	Niedrig	Sehr niedrig	Weiß nicht
11.41 den Aufwand zur Einführung	<input type="checkbox"/>					
11.42 den Nutzen (allgemein)	<input type="checkbox"/>					
11.43 die Häufigkeit der aktuellen Nutzung	<input type="checkbox"/>					
11.44 die Absicht der zukünftigen Nutzung	<input type="checkbox"/>					
11.45 die Bedeutung für Ihr Geschäft in Zukunft	<input type="checkbox"/>					

Appendix 2

Questionnaire Main Study

1. Selektionsfragen [Continue]

Als geringfügig Beschäftigte

15

- 16 Ist die Nachfolge im Unternehmen gesichert?
- | | | |
|---|--|--|
| <input type="checkbox"/> Ja, in der Familie | <input type="checkbox"/> Ja, im Mitarbeiterkreis | <input type="checkbox"/> Ja, von Außerhalb |
| <input type="checkbox"/> Nein | <input type="checkbox"/> Noch kein Thema | |

2. Abschnitt 1: Haltung zur Digitalisierung

	Stimme voll zu	Stimme zu	Teilweise	Stimme weniger zu	Stimme nicht zu	Keine Antwort
2.1 Ich finde Digitalisierung gut.	<input type="checkbox"/>					
2.2 Ich stehe der Digitalisierung ablehnend gegenüber.	<input type="checkbox"/>					
2.3 Ich finde Digitalisierung vorteilhaft.	<input type="checkbox"/>					
2.4 Das Erlernen digitaler Anwendungen fällt mir leicht.	<input type="checkbox"/>					
2.5 Ich nutze digitale Anwendungen ohne Probleme.	<input type="checkbox"/>					
2.6 Ich habe Schwierigkeiten bei der Nutzung digitaler Anwendungen.	<input type="checkbox"/>					
2.7 Ich kann den Nutzen digitaler Anwendungen erklären.	<input type="checkbox"/>					
2.8 Ich kann Vor- und Nachteile der Digitalisierung erklären.	<input type="checkbox"/>					
2.9 Ich kann die Folgen der Digitalisierung erklären.	<input type="checkbox"/>					
2.10 Digitalisierung erhöht meine Effektivität.	<input type="checkbox"/>					
2.11 Digitalisierung hilft mir mich zu verbessern.	<input type="checkbox"/>					
2.12 Digitalisierung hilft mir Aufgaben schneller zu erledigen.	<input type="checkbox"/>					
2.13 Digitalisierung ist in Zukunft von hoher Bedeutung.	<input type="checkbox"/>					
2.14 In Zukunft kommt man an Digitalisierung nicht vorbei.	<input type="checkbox"/>					
2.15 Digitalisierung wird in Zukunft unser Leben wesentlich bestimmen.	<input type="checkbox"/>					
2.16 Ich habe ausreichend Ressourcen für das Thema Digitalisierung.	<input type="checkbox"/>					
2.17 Ich verfüge über ausreichende Kapazitäten für das Thema Digitalisierung.	<input type="checkbox"/>					



2. Abschnitt 1: Haltung zur Digitalisierung [Continue]

	Stimme voll zu	Stimme zu	Teilweise	Stimme weniger zu	Stimme nicht zu	Keine Antwort
2.18 Ich kann die Digitalisierung mit meinen Ressourcen nicht stemmen.	<input type="checkbox"/>					
2.19 Mein Unternehmen hat keinen finanziellen Spielraum für Digitalisierung.	<input type="checkbox"/>					
2.20 Mein Unternehmen ist in der Lage in Digitalisierung zu investieren.	<input type="checkbox"/>					
2.21 Ich erwarte für die nahe Zukunft eine wirtschaftlich positive Entwicklung für mein Unternehmen.	<input type="checkbox"/>					
2.22 Mein Personal besitzt digitale Kompetenzen.	<input type="checkbox"/>					
2.23 Mein Personal ist in Bezug auf Digitalisierung motiviert.	<input type="checkbox"/>					
2.24 Mein Personal hat Zeit für das Thema Digitalisierung.	<input type="checkbox"/>					
2.25 Ich besitze digitale Kompetenzen.	<input type="checkbox"/>					
2.26 Ich bin in Bezug auf Digitalisierung motiviert.	<input type="checkbox"/>					
2.27 Ich habe Zeit für das Thema Digitalisierung.	<input type="checkbox"/>					
2.28 Meine Ausstellungsfläche entspricht den Anforderungen der Digitalisierung.	<input type="checkbox"/>					
2.29 Meine Lagerfläche entspricht den Anforderungen der Digitalisierung.	<input type="checkbox"/>					
2.30 Meine IT-Infrastruktur entspricht nicht den Anforderungen der Digitalisierung.	<input type="checkbox"/>					
2.31 Meine Produkte sind im Online-Handel konkurrenzfähig.	<input type="checkbox"/>					
2.32 Die Marge meiner Produkte bietet Spielraum für Online-Handel (z.B. Versandkostenübernahme).	<input type="checkbox"/>					
2.33 Meine Produkte haben ein Alleinstellungsmerkmal (z.B. Eigenmarke).	<input type="checkbox"/>					
2.34 Die Politik unterstützt mich bei der Digitalisierung.	<input type="checkbox"/>					
2.35 Die Politik bietet ausreichend Förderungen zur Digitalisierung.	<input type="checkbox"/>					
2.36 Die Politik bietet das erforderliche Weiterbildungsmaterial an.	<input type="checkbox"/>					
2.37 Ich fühle mich zur Digitalisierung gedrängt.	<input type="checkbox"/>					
2.38 An digitalen Angeboten führt heute kein Weg vorbei.	<input type="checkbox"/>					



2. Abschnitt 1: Haltung zur Digitalisierung [Continue]

	Stimme voll zu	Stimme zu	Teilweise	Stimme weniger zu	Stimme nicht zu	Keine Antwort
2.39 Digitalisierung wird von mir erwartet.	<input type="checkbox"/>					
2.40 Meine Angestellten drängen mich zur Digitalisierung.	<input type="checkbox"/>					
2.41 Meine Angestellten machen mir Vorschläge zur Digitalisierung.	<input type="checkbox"/>					
2.42 Die Innovationskraft meiner Angestellten in Bezug auf Digitalisierung ist hoch.	<input type="checkbox"/>					
2.43 Es gibt einen gesellschaftlichen Trend zur Digitalisierung.	<input type="checkbox"/>					
2.44 Die Gesellschaft erwartet heute Digitalisierung in allen Bereichen.	<input type="checkbox"/>					
2.45 Wer nicht digitalisiert, wird abgehängt.	<input type="checkbox"/>					
2.46 Die Politik fordert Digitalisierung.	<input type="checkbox"/>					
2.47 Bürokratie und öffentliche Verwaltung drängen mich zur Digitalisierung.	<input type="checkbox"/>					
2.48 Der Gesetzgeber zwingt mich zur Nutzung digitaler Anwendungen (z.B. Elster).	<input type="checkbox"/>					
2.49 Viele meiner Online-Konkurrenten sind mir in der Digitalisierung voraus.	<input type="checkbox"/>					
2.50 Die wachsende Online-Konkurrenz löst bei mir Handlungsdruck aus.	<input type="checkbox"/>					
2.51 Ich muss gegenüber meinen Online-Konkurrenten in der Digitalisierung aufholen.	<input type="checkbox"/>					
2.52 Meine Lieferanten drängen mich zur Digitalisierung.	<input type="checkbox"/>					
2.53 Meine Lieferanten erwarten digitale Kommunikation von mir.	<input type="checkbox"/>					
2.54 Viele meiner Lieferanten betreiben Online-Handel.	<input type="checkbox"/>					
2.55 Meine Kunden drängen mich zur Digitalisierung.	<input type="checkbox"/>					
2.56 Meine Kunden nutzen digitale Angebote während des Einkaufs im Ladenlokal.	<input type="checkbox"/>					
2.57 Meine Kunden fragen mich explizit nach digitalen Angeboten.	<input type="checkbox"/>					



3. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 1

Erläuterung Fragestellungen

Aktuelle Nutzung: Die tatsächliche Nutzung des genannten Aspektes in Ihrem Unternehmen.

Aktueller eigener Entwicklungsstand: Eine Selbsteinschätzung des aktuellen Entwicklungsstandes Ihres Unternehmens bezüglich des genannten Aspektes.

Notwendigkeit der Nutzung: Ein gesehener Nutzungsbedarf des genannten Aspektes in Ihrem Unternehmen.

Planung zukünftiger Nutzung: Ihre Intention den genannten Aspekt in Zukunft in Ihrem Unternehmen zu nutzen.

Nutzung des Internets zur Informationsbeschaffung im Einkauf

- | | | | | | | | | | | |
|-----|-------------------------------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.1 | Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.2 | Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 3.3 | Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 3.4 | Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Wie häufig nutzen Sie die folgenden Angebote beim Einkauf im Internet zur Informationsbeschaffung?

- | | | | | | | | | | | |
|------|-----------------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.5 | Foren | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.6 | Blogs | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.7 | Verbraucher-Webseiten | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.8 | Hersteller-Webseiten | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.9 | Preisvergleichsseiten | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.10 | Soziale Netzwerke | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.11 | Videoportale | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.12 | Nachrichtenportale | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.13 | Verbandsinformationen | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |

Nutzung des Internets zur Abwicklung des Einkaufs

- | | | | | | | | | | | |
|------|-------------------------------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.14 | Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.15 | Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 3.16 | Notwendigkeit der Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 3.17 | Planung zukünftiger Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Wie häufig nutzen Sie die folgenden Angebote im Internet zur Abwicklung Ihres Einkaufs?

- | | | | | | | | | | | |
|------|---|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.18 | Onlineshops | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.19 | Elektronische Marktplätze (Amazon, Ebay, Rakuten) | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.20 | E-Procurement Lösungen | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |



3. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 1 [Continue]

Nutzung von Anwendungssoftware in der Verwaltung

- 3.21 Aktuelle Nutzung sehr häufig überhaupt nicht keine Antwort
- 3.22 Aktueller eigener Entwicklungsstand sehr hoch sehr niedrig keine Antwort
- 3.23 Notwendigkeit der Nutzung sehr groß überhaupt keine keine Antwort
- 3.24 Planung zukünftiger Nutzung sehr stark überhaupt keine keine Antwort

Welche der folgenden Anwendungssoftwares setzen Sie in der Verwaltung Ihres Unternehmens ein?

- 3.25 Office Programme (Word, Excel, PowerPoint) Ja Nein
- 3.26 ERP-System Ja Nein
- 3.27 Personalverwaltungssoftware Ja Nein
- 3.28 Finanzbuchhaltungssoftware Ja Nein
- 3.29 Zeiterfassungssoftware Ja Nein
- 3.30 Digitale Steuerungssoftware Ja Nein
- 3.31 Content Management System Ja Nein
- 3.32 Kassensoftware Ja Nein

Nutzung einer digitalen Warenwirtschaft

- 3.33 Aktuelle Nutzung sehr häufig überhaupt nicht keine Antwort
- 3.34 Aktueller eigener Entwicklungsstand sehr hoch sehr niedrig keine Antwort
- 3.35 Notwendigkeit der Nutzung sehr groß überhaupt keine keine Antwort
- 3.36 Planung zukünftiger Nutzung sehr stark überhaupt keine keine Antwort

Wenn vorhanden, welchen Leistungsumfang hat Ihre digitale Warenwirtschaft?

- 3.37 Bestandsdatenerfassung Ja Nein
- 3.38 Lagerplatzerfassung im Lager Ja Nein
- 3.39 Lagerplatzerfassung im Ladenlokal Ja Nein
- 3.40 Einbindung von RFID-Tags Ja Nein
- 3.41 Einbindung von Barcodes Ja Nein
- 3.42 Einbindung von QR-Codes Ja Nein
- 3.43 Einbindung von NFC-Chips Ja Nein
- 3.44 Erstellung von Rechnungen Ja Nein
- 3.45 Erstellung von Lieferscheinen Ja Nein
- 3.46 Erstellung von Auftragsbestätigungen Ja Nein
- 3.47 Erstellung von Bestellungen Ja Nein
- 3.48 Erstellung von Bestellempfehlungen Ja Nein
- 3.49 Anbindung an die Kundenverwaltung Ja Nein
- 3.50 Anbindung an die Kassensoftware (PoS) Ja Nein
- 3.51 Anbindung an den Onlineshop Ja Nein

Nutzung eines eigenen Onlineshops

- 3.52 Aktuelle Nutzung sehr häufig überhaupt nicht keine Antwort
- 3.53 Aktueller eigener Entwicklungsstand sehr hoch sehr niedrig keine Antwort
- 3.54 Notwendigkeit der Nutzung sehr groß überhaupt keine keine Antwort
- 3.55 Planung zukünftiger Nutzung sehr stark überhaupt keine keine Antwort



3. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 1 [Continue]

Wenn vorhanden, welchen Leistungsumfang hat ihr Onlineshop?

- | | | |
|---|-----------------------------|-------------------------------|
| 3.56 Suchmaschinenoptimierte Produktbeschreibungen | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.57 Kundenkonto | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.58 Rezensionen (Erfahrungsberichte von Kunden) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.59 Ratings (Bewertungsskala z.B. 0 – 5 Sterne) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.60 Optimiert für mobile Endgeräte (Responsive Design) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.61 Auswahl-Filter (Farbe, Marke, Preis) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.62 Merklisten / Favoriten | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.63 "Ähnliche Produkte" (Produktempfehlungen) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.64 "Kunden kauften auch" (Produktempfehlungen) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.65 Live Chat | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.66 Live Warenbestände (Lager) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.67 Live Warenbestände (Ladenlokal) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |

Nutzung von Drittanbieterplattformen als Verkaufskanal

- | | | | | | | | | | |
|--|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.68 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.69 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 3.70 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 3.71 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Wie häufig nutzen Sie die folgenden Drittanbieterplattformen zum Verkauf?

- | | | | | | | | | | |
|--------------------------------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.72 Amazon | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.73 Ebay | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.74 Rakuten | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.75 Hitmeister | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.76 Etsy | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.77 Yatego | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.78 Allyouneed | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.79 Hood | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.80 Gimahhot | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.81 Lokale Onlineshopping-Plattform | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |

Nutzung von In-Store Applikationen

- | | | | | | | | | | |
|--|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 3.82 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 3.83 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 3.84 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 3.85 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |



3. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 1 [Continue]

Welche In-Store Applikationen nutzen Sie?

- | | | |
|---|-----------------------------|-------------------------------|
| 3.86 Digital Shelf (Digital verlängertes Regal) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.87 Interaktiver Spiegel | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.88 Digital Signage (z.B. TV Screens) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.89 Digitale Preisschilder | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.90 Tablets | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.91 Beacon Technology | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.92 Interaktiver Kiosk | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 3.93 Augmented Reality | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |

4. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 2

Nutzung von Online-Werbung

- | | | | | | | | | | |
|---|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 4.1 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.2 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 4.3 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 4.4 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Wie häufig nutzen Sie die folgenden Arten von bezahlter Online-Werbung?

- | | | | | | | | | | |
|-------------------------------|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 4.5 E-Mail Werbung (Mailings) | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.6 Suchmaschinen Werbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.7 Bannerwerbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.8 Pop-Up Werbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.9 Layer Werbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.10 Video Werbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.11 Social Media Werbung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |

Nutzung von Software zur Marketingunterstützung

- | | | | | | | | | | |
|--|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 4.12 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.13 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 4.14 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 4.15 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Welche Software nutzen Sie zur Marketingunterstützung?

- | | | |
|---|-----------------------------|-------------------------------|
| 4.16 Customer Relationship Managementsystem | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.17 Marketing Automation Software | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.18 E-Mail Newsletter Management-Software | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.19 E-Mail Analyse Software | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.20 Web-Analyse Software | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |



4. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 2 [Continue]

- 4.21 Suchmaschinenoptimierungssoftware (SEO) Ja Nein
 4.22 Social Media Management-Software Ja Nein

Nutzung digitaler Kommunikationskanäle

- 4.23 Aktuelle Nutzung sehr häufig überhaupt nicht keine Antwort
 4.24 Aktueller eigener Entwicklungsstand sehr hoch sehr niedrig keine Antwort
 4.25 Notwendigkeit der Nutzung sehr groß überhaupt keine keine Antwort
 4.26 Planung zukünftiger Nutzung sehr stark überhaupt keine keine Antwort

Wie häufig nutzen Sie die folgenden digitalen Kommunikationskanäle für Ihr Unternehmen?

- 4.27 Email sehr häufig überhaupt nicht keine Antwort
 4.28 Email-Newsletter sehr häufig überhaupt nicht keine Antwort
 4.29 SMS / MMS sehr häufig überhaupt nicht keine Antwort
 4.30 Facebook Fanpage sehr häufig überhaupt nicht keine Antwort
 4.31 Facebook Messenger sehr häufig überhaupt nicht keine Antwort
 4.32 Skype sehr häufig überhaupt nicht keine Antwort
 4.33 WhatsApp sehr häufig überhaupt nicht keine Antwort
 4.34 Instagram sehr häufig überhaupt nicht keine Antwort
 4.35 Pinterest sehr häufig überhaupt nicht keine Antwort
 4.36 YouTube sehr häufig überhaupt nicht keine Antwort
 4.37 Vimeo sehr häufig überhaupt nicht keine Antwort
 4.38 Snapchat sehr häufig überhaupt nicht keine Antwort
 4.39 Twitter sehr häufig überhaupt nicht keine Antwort
 4.40 Xing sehr häufig überhaupt nicht keine Antwort
 4.41 Linked In sehr häufig überhaupt nicht keine Antwort

Angebote digitaler Services

- 4.42 Aktuelle Nutzung sehr häufig überhaupt nicht keine Antwort
 4.43 Aktueller eigener Entwicklungsstand sehr hoch sehr niedrig keine Antwort
 4.44 Notwendigkeit der Nutzung sehr groß überhaupt keine keine Antwort
 4.45 Planung zukünftiger Nutzung sehr stark überhaupt keine keine Antwort

Welche digitalen Services bieten Sie an?

- 4.46 Kostenloser WLAN Zugang Ja Nein



4. Abschnitt 2: Nutzung und Nutzungsabsicht der Digitalisierung - Teil 2 [Continue]

- | | | |
|--|-----------------------------|-------------------------------|
| 4.47 Digitale Einkaufslisten | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.48 Digitale Gutscheine / Coupons | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.49 Barcodes zur detaillierten Produktinformation | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.50 QR-Codes zur detaillierten Produktinformation | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.51 Chat | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.52 Video Telefonie | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.53 App (mit Informationen) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.54 App (In-Store Navigation) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.55 App (Beratung) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.56 App (Onlineshop) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |

Angebote digitaler Zahlungsmöglichkeiten

- | | | | | | | | | | |
|--|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 4.57 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.58 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 4.59 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 4.60 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Welche Zahlungsmöglichkeiten akzeptieren Sie?

- | | | |
|------------------------|-----------------------------|-------------------------------|
| 4.61 Rechnung | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.62 EC-Karte | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.63 Kreditkarte | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.64 Lastschrift | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.65 Sofortüberweisung | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.66 Paypal | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.67 Pay Direct | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.68 BitCoin | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |

Angebot von Lieferservices

- | | | | | | | | | | |
|--|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------|--------------------------|---------------|
| 4.69 Aktuelle Nutzung | sehr häufig | <input type="checkbox"/> | überhaupt nicht | <input type="checkbox"/> | keine Antwort |
| 4.70 Aktueller eigener Entwicklungsstand | sehr hoch | <input type="checkbox"/> | sehr niedrig | <input type="checkbox"/> | keine Antwort |
| 4.71 Notwendigkeit der Nutzung | sehr groß | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |
| 4.72 Planung zukünftiger Nutzung | sehr stark | <input type="checkbox"/> | überhaupt keine | <input type="checkbox"/> | keine Antwort |

Welche Lieferoptionen bieten Sie an?

- | | | |
|---|-----------------------------|-------------------------------|
| 4.73 Lieferung innerhalb von 24 Stunden | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.74 Same Day Delivery | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.75 Same Hour Delivery | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.76 Click & Return | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.77 Click & Collect | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.78 Reserve & Collect | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.79 Versicherter Versand | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.80 Kostenfreier Versand | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.81 Kostenfreier Rückversand | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.82 Versand-Flatrate | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.83 Sendungsverfolgung | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |
| 4.84 Drop-Shipping (Streckenhandel, Direkthandel) | <input type="checkbox"/> Ja | <input type="checkbox"/> Nein |

Vielen Dank für Ihre Teilnahme!

