

JYU DISSERTATIONS 727

Jaana Mähönen

Building Blocks of Trust

Trust and Trustworthiness in the
Context of Sharing Economy and
Adoption of Digital Innovations



UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF INFORMATION
TECHNOLOGY

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ABSTRACT

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Trust is a prerequisite for using digital platforms, and it affects the adoption and use of digital technologies. However, a research gap still exists regarding how smaller platform companies can improve platform trustworthiness when considering that they do not have as many resources as bigger platform companies have. Therefore, understanding why trust is important and, above all, applying theoretical knowledge to practice will support the profitability of companies. The aim of this thesis is to first understand how platform companies can be supported to change and then to provide information and tools to support them in building trust in their platform. The first article examines trust and adoption of digital innovations in the middle of the crisis with a survey, and the second article is action research aiming to support the adoption and use of digital innovations in microenterprises. These papers offer an understanding of the aspects that should be considered when supporting companies' adoption of digital innovations. For example, some important aspects are: a company's trust in its own future, willingness to implement new digital solutions when needed, trust in change agents, and trust in technology. Furthermore, three studies consider the multi-dimensional side of platform trustworthiness that includes the technology, the users, and the platform company. Based on these findings, design implications for platforms to signal trustworthiness are presented. Moreover, how trust can be built in the platform, considering the platform company's own resources, is examined. For this, a survey was designed based on previous theories to measure the trustworthiness of the case platform. The survey offers information from the platform's trustworthiness in terms of three factors: the platform (technology), its users, and the company. This information can be used to further develop the platform when factors that users trust the least in the platform are known. After this, the case company used the developed matrix tool to evaluate how much investment was required to implement different solutions to build trust and how technically complex those solutions were. The dissertation presents a real-life case of how to support the adoption of digital innovations and recognizes the importance of trust building in adoption and use of digital technologies.

Keywords: trust, trustworthiness, platform, sharing economy, digital innovation

TIIVISTELMÄ

Mähönen, Jaana

Luottamuksen rakentaminen: luottamus ja luotettavuus jakamistalouden ja digitaalisten innovaatioiden kontekstissa

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Luottamus vaikuttaa digitaalisten teknologioiden käyttöön ja omaksumiseen ja on edellytys digitaalisten alustojen käytölle. Kuitenkin tutkimus siitä, kuinka voidaan rakentaa luottamusta alustalla huomioiden alustayrityksen resurssit, puuttuu. Pienemmillä yrityksillä ei ole mahdollisuutta käyttää luottamuksen rakentamiseen yhtä paljon resursseja kuin isoilla yrityksillä. Luottamuksen tärkeyden tarkempi ymmärrys ja ennen kaikkea teorian tuominen käytäntöön tukee yritysten kannattavuutta. Väitöskirjan tarkoitus on ensin ymmärtää, kuinka yrityksiä voidaan tukea muutoksessa, ja seuraavaksi tarjota tietoa ja työkalu tukemaan alustayritysten luottamuksen rakentamiseksi niille sopivalla tavalla. Ensimmäinen artikkeli käyttää kyselyä selvittämään luottamusta ja digitaalisten innovaatioiden omaksumista kriisin keskellä ja seuraavassa artikkelissa käytetään toimintatutkimusta tukemaan digitaalisten innovaatioiden omaksumista ja käyttöä mikroyrityksissä. Nämä artikkelit tarjoavat ymmärrystä mitä tulee huomioida, kun yrityksiä tuetaan omaksumaan digitaalisia innovaatioita. Yrityksen luottamus sen omaan tulevaisuuteen, halukkuus ottaa uusia digitaalisia ratkaisuja käyttöön tarvittaessa ja luottamuksen rakentaminen muutosagentteja ja teknologiaa kohtaan huomattiin tärkeäksi. Tämän jälkeen alustojen luotettavuuden moniulotteisuutta käsitellään kolmessa tutkimuksessa. Tuloksiin perustuen esitellään suunnittelun tueksi, kuinka alusta voi viestiä luotettavuudestaan. Seuraavaksi tarkastellaan, kuinka luottamusta voidaan rakentaa alustalla huomioiden alustan omat resurssit. Tätä varten luodaan kysely pohjautuen aiempiin teorioihin ja alustan luotettavuutta mitataan sitä käyttäen. Luotu kysely antaa informaatiota yritykselle alustan luotettavuudesta huomioiden kolme tekijää: alusta (teknologia), sen käyttäjät ja yritys. Tätä tietoa voidaan käyttää alustan kehityksen tukena, kun huomataan esimerkiksi mihin käyttäjät luottavat vähiten alustalla. Tämän jälkeen case yritys arvioi luottamusta tukevien ratkaisujen käyttöönoton teknologista kompleksisuutta ja vaadittua investointia omasta näkökulmastaan käyttäen luotua matriisityökalua. Väitöskirja esittelee tosielämän tapauksia digitaalisten innovaatioiden käyttöönoton tukemisesta ja tunnistaa luottamuksen rakentamisen merkityksen tässä yhteydessä.

Avainsanat: luottamus, luotettavuus, alusta, jakamistalous, digitaaliset innovaatiot

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My path toward a PhD has not been straightforward. I have studied tourism (bachelor), business (bachelor), and information systems (master's and now PhD). My supervisors have changed during my doctoral studies, and even a joke circulated within my friend circle that if you want to get rid of a person, you should ask them to supervise Jaana, because my supervisors always seem to move away from University of Jyväskylä (JYU). However, I am glad and grateful to every one of them. Thank you, Assist. Prof. Naomi Woods, Prof. Tuure Tuunanen, Prof. Arto Ojala, Dr. Tero Tuovinen, and Prof. Pekka Neittaanmäki for all your guidance. Dear Naomi, I am especially grateful for your excellent ability to support and demand. Without you, this thesis might not have been completed. You are a wonderful human being with a big heart, and you have excellent leadership skills! In addition, I owe thanks to my coauthor Assist. Prof. Leona Chandra Kruse, who has the skill to see the big picture. I owe my thanks to Dr. Pauliina Salmi, Dr. Anna Raita-Hakola, and Dr. Leevi Annala for their advice, proofreading, and support. This thesis was funded by the University of Jyväskylä and The Foundation for Economic Education, and I am very grateful for the funding. Thank you, Dr. Annemari Auvinen, Jukka Valkonen, and Jarno Kiesiläinen for your work in the Digipolku project (the data from this project is used in the second article). It would not have been such a successful project without you. My thanks also to my dear elder sister, Eija Mustonen, who has been helping me with proofreading and guiding me in using YSO key words. Yes, Eija, your help is acknowledged and much appreciated.

One day, when I was working as student counsellor and was on my lunch break, I was asked what the topic of my thesis was, and I just looked at the person with a blank expression. I told them that I study trust in the field of information systems, and they asked me not to be in the psychology department then. I was quite tired because I had just had many meetings with new students. I do not think I answered the question aptly at that point in time, even though I knew why trust should also be studied in the field of information systems. I hope that after reading this thesis, the readers understand what trust is, why it is so relevant, and why it should also be studied in the field of information systems. Thank you, Pauliina Salmi, for making me believe in myself when I felt others had doubts about my work.

We have different ideas and reasons for why the research is done. Some think it is important because, with research, we can develop new theories. Others think it is about discovering new knowledge. Both of these are, of course, important; however, for me, it is a way to contribute for a better world. In my twenties, I thought changing the world would need huge action; I thought it would mean sacrificing your own personal life. However, I later noticed that little changes can make a huge differences. This work is based on this principle. Thank you, Mom, for making me a realistic optimist.

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ABSTRACT

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- II Räisänen, J., & Tuovinen, T. (2020). Digital innovations in rural microenterprises. *Journal of Rural Studies*, 73, 56-67.
- III Räisänen, J., Ojala, A., & Tuovinen, T. (2021). Building trust in the sharing economy: Current approaches and future considerations. *Journal of Cleaner Production*, 279, e123724.
- IV Mähönen, J., Ojala, A., & Chandra K. L. Signaling the trustworthiness of sharing economy platforms: Insights from users' first impressions and platform analysis. (Under review)
- V Mähönen, J. Build trust sensibly. (Unpublished working paper)

AUTHOR CONTRIBUTIONS

I am the first author of all the articles included in this thesis. This is because I am the one who is studying trust, and my supervisors and colleagues are not specified to trust. I have not worked a doctoral thesis or research or studied trust before; therefore, my learning curve has been steep. The contributions are explained in more detail as follows.

Article I.

The second author had the idea of collecting data from enterprises during the COVID-19 pandemic and had various inputs or comments on the work in different phases. The first author wrote the theoretical foundation, developed the survey, collected the data, analyzed the data, and wrote the article using the second author's comments as support for doing so.

Article II.

This article used data gathered from the Digipolku project. The concept of the workshops was developed during the project. The idea to use these data came from the second author. The first author collected the data, analyzed it, and wrote the article using the second author's comments as support for doing so.

Article III.

The first author noticed that there was a research gap considering trust in the sharing economy, as the holistic picture was missing. The first author had the responsibility of collecting the data, analyzing it, and writing the article, but all the authors were involved in writing the article, especially regarding theoretical contributions.

Article IV.

The first author was responsible for collecting data, analyzing them, and exploring the theoretical foundation. The second author took part in writing the think-aloud study. The third author also took part in writing the article as a whole and contributed to designing most of the figures and helped with findings. Please note that surname of Räsänen has changed to Mähönen.

Article V.

The article is one author paper but assist. prof. Leona Chandra Kruse helped with the paper.

1 INTRODUCTION

Trust seems to play an important part in almost any human interaction: effective communication, learning and problem-solving all require trust.¹

In society, especially in a digital environment, no certainty exists that all the situations will go as expected, and everyone is trustworthy. The digital environment makes it easier to deal with strangers and outside people's social connections; therefore, the question of trustworthiness becomes even more important when uncertainty is rampant. Trust reduces uncertainty (Hsu & Chang, 2014; Liang et al., 2018) because it allows a person to act based on the evidence of trustworthiness. Furthermore, trust can increase transactions on the digital platform (Zhao et al., 2023), affect attitudes toward online stores (Lim et al., 2006), and remain essential for cooperation (Choi & Cho, 2019). However, what remains unclear is the relationship between trust and digital innovations from the perspective of microenterprises, and this thesis seeks to address this research gap. The importance of trust in digital platforms is known, and some of the solutions for building trust have also been considered in previous research. However, consensus has not yet been achieved on how different platforms can (considering platforms' resources) build trust, and this thesis focuses on the same. The aim for conducting this research was to understand the adoption of digital innovations by companies and the importance of trust in them to plan actions for platform companies to improve trust in their platform's effectively (Figure 1). Small and nonprofit platforms may not have as good a technological competence as bigger platforms such as Uber or Airbnb. They also have fewer resources for further developing the platform. Therefore, this study first presents findings considering trust in the adoption of digital innovations and then focuses on trust in the

¹ Blomqvist, 1997, pp. 283.

sharing economy. This dissertation consists of five scientific publications or manuscripts on trust and a related summary.



FIGURE 1 Thematic development of the thesis

Microenterprises are defined for the purposes of this thesis as companies that have less than 10 employees and small and medium companies are those that have less than 249 employees (Yrittäjät, 2023). Examining microenterprises is important as most of the Finnish companies, 93 %, are microenterprises and there are only 0,20 % large enterprises (personnel more than 249) (Yrittäjät, 2023). Microenterprises do not have as many resources, employees or money, to develop their operations, but they are important to national economy not only in Finland but also in other parts of Europe too, for example, in Germany (Roitzsch et al., 2012). There are multiple definitions of sharing economy and also multiple definitions that refer to other similarly related terms, e.g., peer-to-peer economy or collaboration consumption. Here sharing economy is defined as a digital platform which facilitates the sharing of underutilized assets and services without change in ownership and with or without payment (Schlagwein et al., 2020). Microenterprises and sharing economy companies are related as it is proposed that especially small and local platforms can support sustainability (see, e.g., Martin et al., 2016; Zamani et al., 2017). In this thesis, research was conducted, examining a case platform company, which is a microenterprise (Article IV). From the findings of this thesis, the aim is to support the small or non-profit platform companies towards developing more trustworthy platforms.

Trust is important to society. Without trust, people cannot act efficiently. Especially now, when digitization permeates society's functions, from education to trade to hobbies and leisure, trust is essential. Trust can reduce uncertainty (Hsu & Chang, 2014; Liang et al., 2018) and positively affect the performance of virtual teams (Kanawattanachai & Yoo, 2002). Furthermore, trust can increase transactions on the digital platform (Zhao et al., 2023), affect attitudes toward

online stores (Lim et al., 2006), and remain essential for cooperation (Choi & Cho, 2019). Hence, understanding how trust is built can not only help, for example, in cases in which trust is violated (Lewicka, 2022), but also make designing trust-building measures easier in digital environments such as sharing economy platforms. This thesis focuses on trust building and contributes by increasing theoretical and empirical knowledge of trust building in two contexts: adoption of digital innovation and sharing economy platforms.

There are multiple definitions of trust depending on the field of study (Schoorman et al., 2015). In the field of information systems (IS) science, the definition by Mayer et al. (1995) is widely used (see, e.g., Brown et al., 2004; Jarvenpaa et al., 2004; Kim & Benbasat, 2006; Li et al., 2008; Söllner et al., 2016b), and it is quite clear and well put definition of difficult and abstract phenomena. It is used here as a citation.

The definition of trust proposed in this research is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.²

Although this thesis examines trust within the IS context, it is a multidisciplinary thesis, with support from research from other fields of study, such as psychology and economics. In IS, trust has often been studied from the perspective of technology (see Section 2.2.). However, Hacker et al. (2019) suggested that IS studies should consider dynamic, multidimensional aspects of trust and take into account previous studies in the field of management and psychology. Thus, this thesis will also take an interdisciplinary approach in examining trust.

Trust is an important area of study, especially in the digital era because the digital world and technologies increase its demand. For example, if a person wants to buy a couch/sofa, they can go to a well-known furniture store with a long history and good reputation. The person (customer) can see the couch/sofa: what size or color it is, how the fabric feels, and how it feels to sit on. Based on a positive assessment, they can buy it and take it home. There is not much risk here; they have seen and taken home what they have purchased. However, if a person is planning a holiday in Gdansk, Poland, where they have never been, and book accommodation through Airbnb, the story is a bit different. The person (traveler) does not know the renter or whether he or she is trustworthy. It is possible to see pictures of the place, but sometimes, pictures do not tell the whole story. The information the traveler gets is the information that the host has provided through Airbnb. Here, trust is needed: the traveler cannot be certain that everything will go well, and the accommodation is as it should be. The information that the traveler uses to evaluate trustworthiness in the digital world is different: its reviews in terms of average star ratings, written recommendations, and pictures. Through the research conducted in this thesis, the reader will get an idea of how to build trust in the digital environment and toward digital innovations.

² Mayer et al., 1995, p. 712

1.1 Background

Trust is an important factor fostering the use of information systems (IS).³

Trust has been studied to some extent in the IS context. For example, trust among employees and IS positively affects product innovations (Zhang et al., 2018), and trust significantly influences a person's decision to use internet banking (Hoehle et al., 2012). However, IS can refer to various systems with numerous purposes and users, so the research on trust in IS should be examined in a narrower area before generalization. Otherwise, essential factors and mechanisms may be lost. In addition, trust affects the adoption and diffusion of digital innovations, for example, the use of mobile banking (Lin, 2011) or artificial intelligence (AI) (Bedué & Fritzsche, 2022). Adoption of digital innovation can be improved/supported with interventions such as workshops. One of the objectives of this thesis is to examine the relationship between trust and digital innovation from the perspective of microenterprises through the following question: Does the workshop concept supporting trust building, information sharing, and networking affect the adoption of digital innovations in microenterprises, and, in the time of COVID-19, how entrepreneurs' trust in technology as well as their interpersonal trust, affect technology adoption? Of all enterprises in Finland, 93% are microenterprises, and only 0.2% are large enterprises (Yrittäjät, 2023). Microenterprises are also noted to be important in other European countries. For example, in Germany, microenterprises are seen as critical to Germany's economic stability (Roitzsch et al., 2012). Therefore, it is essential to study how microenterprises adapt to changing situations and determine how these enterprises can be supported in the future.

The sharing economy has the potential to ensure sustainability (Cherry & Pidgeon, 2018) because it enables people to not necessarily have to purchase physical assets (Schor, 2016). Furthermore, the sharing economy offers new ways of making money (Schor, 2016), and it can provide products and services at a more affordable price (Leung et al., 2019). However, the sharing economy, or the platform economy in a broader sense, is more complicated than traditional e-commerce. For example, consumers can be service providers, or companies can be customers. Sharing economy is usually seen as an intermediary, and at its core operations is the process of building trust among users (Constantiou et al., 2017). This is why trust is essential for the sharing economy. Trust is also a significant factor to predict platform usage (Hawlitschek et al., 2018), its repeated usage (Arteaga-Sánchez et al., 2020), and the decision for using it (Amirkiaee & Evangelopoulos, 2018). More research is needed on trust in the sharing economy, because complete understanding of it as a bigger paradigm, and the significance and mechanisms of trust development within are still not fully understood (Cohen & Munoz, 2016). This research aims to recognize the factors and technological solutions that build trust in the sharing economy.

³ Söllner et al., 2016b, p. 274

1.2 Objectives and research questions

This thesis has two objectives: in the context of digital innovations, the idea is to provide important information for planning better actions to improve the adoption of digital innovations, and trust building is a seminal part of this. In the context of the sharing economy, the objective is to draft a tool and collect information that especially small and nonprofit platforms can use, because they cannot afford to use all possible solutions to build trust, in which case, they must be able to make informed choices of which solutions they use. The solution that builds the most trust is not always the most reasonable; hence, financial and technical demands must also be taken into account.

Trust is a necessity for the diffusion of innovation (Buskens, 2020). However, it is not a permanent quality; it can change, erupt, or slow down (Lewicka, 2022). Changing situations, such as the COVID-19 pandemic, can affect trust and coping. Unfortunately, the pandemic affected the poverty rate, employment, and the nature of work (Mofijur et al., 2021), but it also gave an opportunity to learn from it. Before COVID-19, there were other large-scale crises, such as the outbreak of foot-and-mouth disease in the United Kingdom in 2001 and the financial crisis and recession during 2007–2008 (Phillipson et al., 2020), and other large-scale crises are likely in the future. Therefore, it is useful to learn how crises affect companies. Lippert and Davis (2006) proposed that trust in technology and a person's interpersonal trust affect technology adoption in general. Previous research has not addressed the relationship between trust and companies coping with changing situations. This led to the first research question:

RQ1 Does trust affect how well a company copes with changing situations?
(Article I)

In previous research, theories such as the Technology Acceptance Model (TAM) (Davis, 1985; Davis et al., 1989), the United Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh & Davis, 2000; Venkatesh et al., 2003), and Rogers's innovation diffusion theory (Rogers, 2003) have been applied to explain diffusion and the adoption of innovations. Drawing from these theories, a workshop concept was developed to support the adoption of digital innovations in rural companies in real-life settings, as a digital divide between urban and rural areas has been highlighted (Park, 2017; Veselovsky et al., 2018; Saleminik et al., 2017). One way to reduce this gap is to support is the adoption of digital innovations by rural companies, for which the Digipolku project was planned. TAM and UTAUT use surveys to describe an individual's acceptance of IS. However, description alone is not enough to make a change in action. In our study, we wanted to draw from previous theories and plan activities that support digital innovation adoption in rural microenterprises. We aimed to answer the following research question:

RQ2 Does the workshop concept supporting trust building, information sharing, and networking affect the adoption of digital innovations in microenterprises? (Article II)

Previous research has shown that trust is important for making decision to use a sharing economy platform (Arteaga-Sánchez et al., 2018; Edbring et al., 2016) and the intention to share in the sharing economy platform (Hawlitschek et al., 2018). These findings suggest that trust affects both potential buyers' and sellers' behavior when considering the sharing economy. Still, there was a lack of a holistic picture of different sharing economy platforms and their mechanisms of trust building (Cohen and Munoz, 2016). Many studies consider either only specific platforms such as Airbnb (see, e.g., Abrahao et al., 2017; Kakar et al., 2018; Tussyadiah & Park, 2018; Wang & Jeong, 2018) or specific types of platforms such as those involved in ride sharing (see, e.g., Amirkieae & Evangelopoulos, 2018; Arteaga-Sánchez et al., 2018; Lee et al., 2018). By investigating trust more holistically in the literature review, we aimed to clarify the factors that facilitate trust building in sharing economy platforms and offer suggestions for future studies on the topic. Therefore, research questions 3 and 4 are as follows:

RQ3 What can be learned from earlier research about trust building in the context of the sharing economy? (Article III)

RQ4 How can trust be built in the sharing economy? (Article III)

The lack of trust can be one reason why sharing economy businesses fail (Chasin et al., 2018). This is not surprising when trust in the sharing economy is a key prerequisite for using a platform (Hawlitschek et al., 2016). The first impression of the platform can be one of the factors that leads to either its use or rejection. However, the first impressions of the platform have not been studied sufficiently with sharing economy platforms and, as stated earlier, most of the studies concentrate only on certain trust-building solutions. For this reason, we did not limit the research to certain trust-building solutions in Article IV but gave participants room for their own observations. Therefore, research question five is as follows:

RQ5 How do first-time users evaluate the trustworthiness of the sharing economy platforms? (Article IV)

De Reuver et al. (2018) proposed that how digital platforms should be designed should be studied more. In our literature review, we examine what can be learned from earlier research on trust building in the context of the sharing economy. Before drawing conclusions about how platforms should be designed to support trust, it is useful to understand what kinds of solutions they are using now. Thus, the sixth research question attempts to shed light on what kinds of signals platforms use:

RQ6 How do sharing economy platforms signal trustworthiness for users?
(Article IV)

As discussed earlier, trust is essential for users to use the sharing economy platform (see, e.g., Arteaga-Sánchez et al. 2018; Lee et al., 2018). Therefore, we assume that designing a platform for building trust is reasonable and can lead to an increase in the use of the platform. However, especially small or non-profit platforms cannot afford to take every available action for building users' trust. This is why the company's resources should also be considered, and this leads to research question seven:

RQ7 How to not only build trust in the sharing economy but also consider the resources of the company? (Article V)

Having reviewed prior research concerning trust in the sharing economy and examining ways to design trustworthy sharing economy platforms, we aim to offer platform designers a way to evaluate the trustworthiness of the sharing economy platform. By identifying the platform's weaknesses in terms of trust, better decisions can be made regarding where to invest in its development. This is why the last question of this thesis is as follows:

RQ8 How can trustworthiness in the sharing economy platform be measured?
(Article V)

By answering these questions, this thesis aims to build new theoretical knowledge of trust in the context of the adoption of digital innovations in companies and the sharing economy. In addition, this thesis aims to put theoretical knowledge and the results of our research and previous studies into practice to provide tools or methods for those who plan actions to improve the adoption of digital innovations in companies and for those who design digital platforms.

This thesis consists of five chapters. Chapter 1 introduces the dissertation, the topic, the research questions, and the structure of the dissertation. Chapter 2 presents a review of the literature and the theoretical foundation. Chapter 3 describes the research approaches and methodologies. Chapter 4 examines the findings of the five articles included in this dissertation and briefly introduces them. Chapter 5 discusses the theoretical and practical implications of this dissertation, its limitations, and future research topics. In the end of this thesis, original articles or paper drafts are presented.

2 REVIEW AND THEORETICAL FOUNDATION

Trust is important in any context that includes human interaction, for example, in the sharing economy or when someone introduces a innovation to use. Trust is needed both in physical encounters and digital society. This chapter presents the definition of trust and findings of earlier research about trust and how it is built. Trust, as a term, can cause misunderstandings, and even previous studies do not always agree on how it is defined. After reading the theoretical foundation, it is easier to understand the research questions and the thesis findings.

2.1 What is trust?

Trust has been studied in multiple fields of study like, for instance, in IS (more about this in chapter 2.2), in sociology (see, e.g., Lewis & Weigert,1985, Cook et al., 2005, Gambetta, 2000), in psychology (see, e.g., Colquitt et al. 2007, Ert & Fleischer, 2020) and in business (see, e.g., Hallikainen & Laukkanen, 2021). Trust can be difficult to define, and it can easily be mixed with other similar concepts, such as confidence or familiarity. To understand the differences between these terms, the terms are defined using the definitions of the well-known trust researcher Luhmann:

1) Familiarity

Familiarity is an unavoidable fact of life; trust is a solution for specific problems of risk.⁴

2) Confidence

If you do not consider alternatives (every morning you leave the house without a weapon!), you are in a situation of confidence.”

⁴ Luhmann, 2000, p. 94-96

3) Trust

If you choose one action in preference to others in spite of the possibility of being disappointed by the action of others, you define the situation as one of trust.

In other words, trust is needed in situations that have a possibility of disappointment of things not going as planned (Gambetta, 2000; Lewis & Weigert, 1985; Luhmann, 2000). In these situations, evidence of trustworthiness is evaluated, and decisions are made to trust or not to trust (Gambetta, 2000). Some academics describe trust as a social phenomenon: social interaction is at its core (see, e.g., Lewis & Weigert, 1985; Luhmann, 2000; Gefen, 2000). Others see it as a psychological phenomenon; it is about the psychological state of the trustor (see, e.g., Akhmedova et al., 2021; Mayer et al., 1995; McKnight et al., 2002b). According to Rousseau et al. (1998), trust is a psychological state of mind that causes or results from choice or behavior, and it is not behavior or choice itself. Trust reduces complexity (Gefen, 2000) when we do not have to be certain about something. Certainty needs proof that nothing can go wrong. Trust needs evidence of trustworthiness, but it makes acting without certainty possible. Rousseau et al. (1998) described trust as having three phases: building, stability, and dissolution. First impressions impact trust (Büttner & Göritz, 2008) and in this thesis first impressions are seen as the first stage of trust building.

Trust is needed when dealing with many of our societal dilemmas. We need to decide the trade-offs: Do we want to choose short-term self-interest or favor the group interest. When we have only limited resources and we decide to choose the self-interest leading to a bad choice for the group, we are talking about the Tragedy of Commons (see Hardin, 1968). How about the world of research? We have only limited funding. What do we choose: Self-interest or group interest? The other societal dilemma, including trust, is the free riding problem (Schneier, 2012). This means that one person benefits from others without doing anything by themselves. For example, if I do not pay taxes, I benefit more from my paycheck and services paid with other taxpayers' money. However, when more and more people stop paying taxes, we cannot afford the services anymore. However, these societal dilemmas are not often really dilemmas because we usually do not ponder whether we, for example, should pay taxes or not (Schneier, 2012).

To summarize, trust is needed in many uncertain situations, but it is not needed in every social action. Some situations are seen as so mundane that we do not need trust. Usually, society's laws and regulations make sure that consequences are quick in mundane situations. Furthermore, it is often our self-interest to behave the way that they are maintaining relationships in the future (Cook et al., 2005). However, in many cases, trust is needed because there is no certainty about what will follow in a situation. The same applies in digital environments, such as e-commerce or sharing economy platforms. Trust is trust, regardless of the environment. However, in the field of IS, some researchers discuss trust, and others discuss digital trust. It is important to understand that

these terms do not refer to the same thing that can be defined and measured in the same way. Therefore, the differences between these terms are presented next.

2.1.1 Trust versus digital trust

Trust and digital trust are not the same thing. Trust is the object of this thesis and its research. However, to avoid misunderstandings, digital trust is briefly discussed. Earlier in this thesis, it was mentioned that trust is not always understood in the same way, and the same applies to the term digital trust. Recently, researchers declared that dimensions of digital trust are unclear (Ko et al., 2022), and the concept of digital trust does not have a unified definition (Guo, 2022, p. 3). Even if papers declare that they are dealing with digital trust, they may only define trust (see, e.g., Hermawan, 2019; Möhlmann, 2021). Because of these inconsistencies in studies considering digital trust, this thesis uses the word trust, which is a better-understood term with a broader theoretical foundation.

Digital trust can be described as trust in the digital era (see, e.g., Guo, 2022; Kozuch, 2021), but it is often defined as more technical in nature. Mattila and Seppälä (2016) wrote that digital trust has three factors: security, identifiability, and traceability. Laatikainen et al. (2021) discussed how issuers, holders, and verifiers form a digital trust triangle. These factors are quite technical and are often compound to security issues (see, e.g., Abubakar & Hassan, 2018; Hermawan, 2019; Mattila & Seppälä, 2016). This suggests that digital trust is not yet a well-defined concept; therefore, it can refer to aspects that consider security issues. If digital trust is defined as trust in the digital era, then it would be in line with this thesis, but because the term is used very differently in different papers, this thesis discusses trust, not digital trust. In addition to differences between digital trust and trust, there are also differences between digital trust and online trust. Online trust refers to trust that involves electronic medium, for example web site, and the object of trust can also be the technology (Shankar et al., 2002). Online trust is studied more than digital trust and unlike digital trust its definition and constructs seem to be more well-known. Benbasat et al. (2008) declare that “research has already established the structure of online trust” referring to study of McKnight et al. (2002a). Next, it is discussed more about the details of trust (also online trust and trust in the field of IS), what it consists of, and the objectives of trust. Understanding these would leads us further in understanding trust.

2.1.2 Constructs of trust: what does trust consist of?

Trust can be divided into different aspects, such as disposition to trust, institutional-based trust, trusting beliefs, trusting intentions, and trust-related behaviors (McKnight & Chervany, 2001; Ter Huurne et al., 2017). Disposition to trust refers to how trustworthy a person is. It is a person’s universal stance toward trusting, not trust, toward a specific target (Gefen, 2000). Mayer et al. (1995) used the term propensity to trust when they talked about a person’s “*general willingness to trust others.*” Disposition of trust is a background factor that

cannot be directly influenced by actions that build trust, such as adding technological solutions to the sharing economy platform. Therefore, disposition to trust is not the focus of this thesis because it is a personal background factor that cannot be controlled. However, the term is defined here because it is an important part of the broader understanding of trust.

Institutional trust has been referred to as a situation in which a person can trust something without personal experience because of institutional safe-guards (Bachmann & Inkpen, 2011). Previous research has often had the perspective that institutional trust does not play a big role and that trust is micro-level happening between the trustor and trustee (Bachmann & Inkpen, 2011). However, there are also studies that show that institutional mechanisms build trust like Pavlou and Gefen (2004) and, for instance, McKnight et al. (2002b, p. 304) noted:

Sociologists found that trust in people is supported by the institutional (i.e. legal, governmental, contractual, regulatory) structures that create an environment that feels safe and secure to participants.⁵

Institutional trust may be related to trust transfer, because it works similarly. Trust transfer refers to situations in which, for example, trust is transferred from a crowdsourcing platform to its projects (Moysidou & Hausberg, 2020). More about trust transfer is discussed in Chapter 2.3 in which trust building is discussed more.

Trusting beliefs refer to how trustworthy someone or something is, and trusting intentions refer to willingness to depend on someone or something (McKnight et al., 2002b). Trustworthiness is thought to be predicted by three factors: ability, benevolence, and integrity (Akhmedova et al., 2021; Büttner & Göritz, 2008; Colquitt et al., 2007; Gefen & Straub, 2004; Hallikainen & Laukkanen, 2021). Trustworthiness and its factors are presented in Figure 2. Trustworthiness can be affected by influencing these factors, which is why trustworthiness, in particular, is a promising research objective in the context of platforms and in platform design and development. We focus on trustworthiness in Articles IV and V.

⁵ McKnight et al., 2002b, p. 304

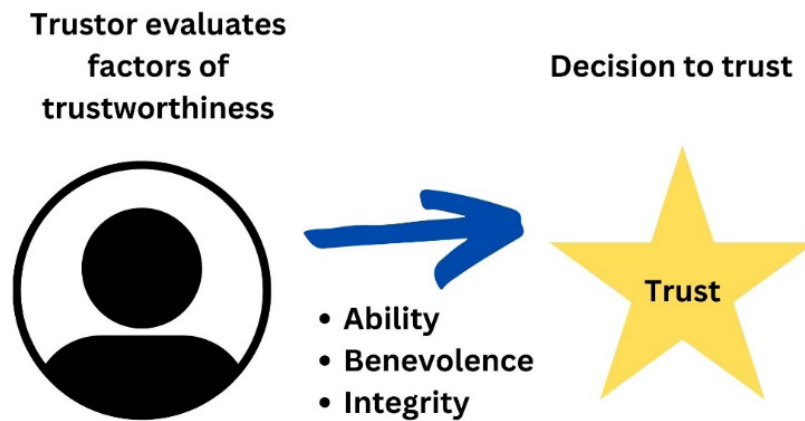


FIGURE 2 Illustration of trustworthiness and its factors (referring to the theory of Mayer et al., 1995)

The relations between these dimensions of trust are not easily explained. A study by McKnight et al. (2002b) suggested that trusting intentions and trusting beliefs affect behavioral intentions, and institutional structure factors affect trusting intentions and trusting beliefs (McKnight et al., 2002b). The trust relations of McKnight et al. (2002b) are illustrated in Figure 3. In the extended trust model of Li et al. (2006), disposition to trust leads to institution-based trust and to trusting beliefs, and then trusting beliefs lead to trusting attitudes and trusting intentions. It seems that this model is based on the idea that trust is a psychological state, trusting intentions are enough, and they have not led to the action. Furthermore, some academics, such as Hardin (2002), problematized the fact that papers often mention that they are speaking of trust even if they are studying what actually leads to trust, that is, things that affect the evaluation of trustworthiness. However, in the same book, Hardin (2002) wrote that no universal truth or way to define trust exists. Considering this, in this thesis it is proposed that it is more important to define what is meant by trust than to problematize the use of trust and trustworthiness as synonyms in research. Trusting beliefs, that, trustworthiness, are often seen as predictors of trusting intention or trusting behavior (see, e.g., Li et al., 2006; McKnight et al., 2002b). In this thesis, relations of trust are seen, as McKnight et al. (2002b) proposes them, and Figure 3 presents. Now, the reader understands how trust is defined and the relationship between trust factors. The next chapter discusses the objective of trust, because it is an important part of the definition of trust.

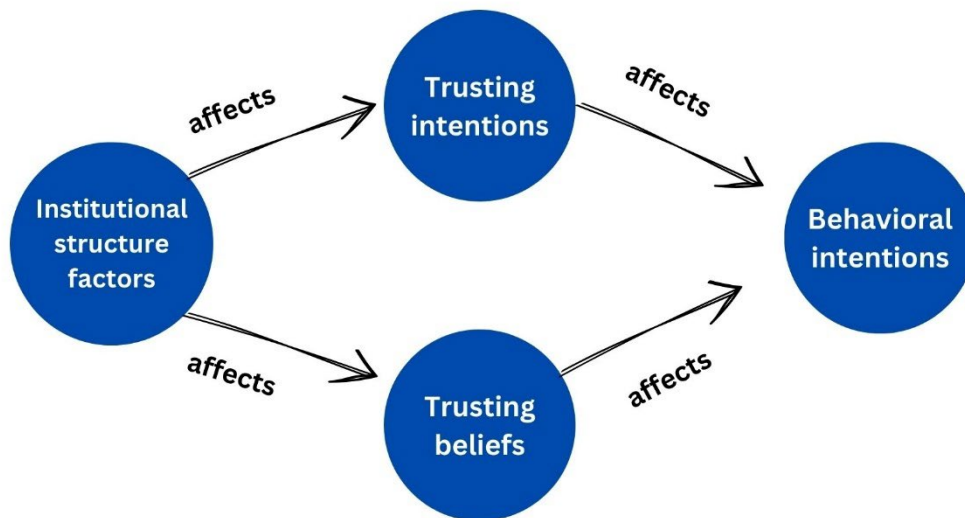


FIGURE 3 Illustration of trust relations based on McKnight et al. (2002b)

2.1.3 What or who can be the trusted party?

Mayer et al. (1995) argued that it is relevant not just to ask whether you trust something/someone but to ask more precisely whether you trust something/someone to do something. The trust is domain specific (Schoorman et al., 2015). The decision to trust may change when we are changing the thing we are expecting them to do. We can trust electricians to change light bulbs, but we may not trust them with plumbing. Therefore, this chapter discusses more about the subjects of trust: who or what they can be.

Cook et al. (2005) proposed that only interpersonal trust between humans is needed, and institutions and organizations do not need trust because they “substitute for trust relations.” However, the field of IS does not see trust in the same way. For example, in their review of IS literature on trust, Söllner and Leimeister (2013) found four kinds of trustees: human beings, organizations, institutions, and IT artifacts. Another study showed that trust in the IS, trust on the internet, and trust in the provider have a significant impact on technology adoption (Söllner et al., 2016b). Furthermore, many studies covered trust in specific IS or technology (see, e.g., Chung & Kwon, 2009; Hoehle et al., 2012). This thesis considers three subjects of trust: human beings, organizations, and technology. Targets of trust are illustrated in Figure 4. As previously mentioned, the perspective of IS science on trust can differ from other disciplines, so in the next chapter we will take a closer look at the study of trust in the field of IS science.

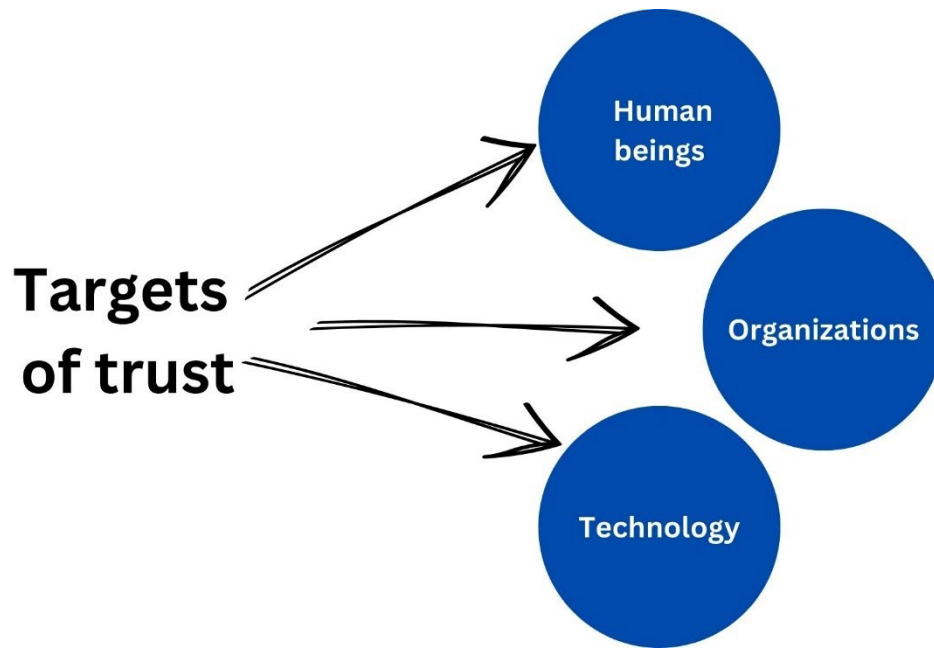


FIGURE 4 Different targets of trust can be human beings, organizations or technology

2.2 Trust research in information systems

Seven years ago, the MISQ Curation on Trust (Söllner et al., 2016a) recognized 35 articles relevant to trust curation that have been published in MIS Quarterly. Other top IS outlets have published also interesting articles about trust in the field of IS. Over ten years ago Ba and Pavlou (2002) declared that “the extant research mainly focuses on the consequences of trust”. After that researchers have widened the scope and other aspects of trust have been considered. This chapter discusses trust research in the field of IS. Often, the core of IS studies lies in information technology artifacts (Gregor, 2006). It seems natural when scholars have demanded more attention, especially for those (see, e.g., Orlikowski & Iacono, 2001). Correspondingly, research considering trust in the field of IS mainly focuses on trust in IT artifacts (see Table 1). However, IS research also focuses on organizational actions and social change (Avgerou, 2000), and studies such as that of Söllner and Leimeister (2013) have found four kinds of trustees: human beings, organizations, institutions, and IT artifacts. Söllner et al. (2016b) recognized three kinds of trust: trust in the IS, trust in the internet, and trust in the provider. The use of the term IT artifact has been criticized, for example, by Alter (2015), because its definition and use are not cohesive. However, Table 1 uses the word IT artifact because it is used in, for example, the study of Söllner and Leimeister (2013), which provided a broader understanding of trust targets in the field of IS. The term IT artifact has been used to refer to, for example, “technologies consisting of hard-ware and software, sociotechnical systems with human participants, and processes and methods” (Alter, 2015, p. 48). Here, it is used as a common term for “technologies consisting of hardware and software.”

To further understand the trust targets in IS, a narrative literature review was conducted from 21 February 2022 to 22 March 2022. Google Scholar was used as a database, and the search words were trust in information systems. Studies were selected manually, so this is not a comprehensive meta-analysis. The results are presented in Table 1. Ten studies from top outlets of information systems science were added on November 2023 to be sure that the most relevant studies were identified. Most studies considered trust in IT artifacts as a target of trust. Fewer chose trust between humans as a perspective for the study. I argue that trust in IS should be studied more holistically if the object of the study is organizational actions or social change based on research. Whether a person trusts technology does not give much of the guidelines to do any real changes. The object of trust is an important part of the definition of trust, and it is useful to review previous theories of trust in IS.

Forty papers in the table 1 examine trust in many contexts. Trust is studied considering, for example, e-commerce, websites, e-government, mobile banking, or specific information system like Microsoft Access. This arouses curiosity; is trust building context depending? If it is, then it would explain why it is not still thoroughly understood and why so many different information systems have been studied. The reason might be also that the trust is based on evidence of trustworthiness (Gambetta, 2000) and different information systems or digital environments have different ways of signaling the evidence of trustworthiness. Technology and is renewed and updated and the signals of trustworthiness may change. Then the research always has the current knowledge of the matter, and more research is needed to keep up with the developments. However, in the next chapter, we will broaden the perspective to include other fields of study to better understand trust building. Theoretical foundation of trust building is an essential part of this thesis, because its main objective is to learn how to build trust in the context of adoption of digital innovations in companies and in the sharing economy platforms.

TABLE 1 Target of trust, research topic and studied system in the IS studies considering trust

Target of trust	Topic	Studied system	Reference
Trust in IT artifacts	Perceptions of the trustworthiness of government and technology by citizen's	E-government Web sites	Carter and Bélanger (2005)
Trust in IT artifacts	Trust in electronic environments	Electronic environment	Chopra and Wallace (2003)
Trust in IT artifacts	Relationship of website design across cultures to trust, satisfaction and e-loyalty	Websites	Cyr (2008)

continues

TABLE 1 continues

Target of trust	Topic	Studied system	Reference
Trust in IT artifacts	Continuous trust toward internet banking services	Internet banking	Hoehle et al. (2012)
Trust in IT artifacts	Trust-assuring arguments in Internet stores	E-commerce	Kim and Benbasat (2006)
Trust in IT artifacts	Consumers pre-purchase decision and their long-term relationship towards e-commerce Web site	E-commerce Web site	Kim et al. (2009a)
Trust in IT artifacts	Initial trust in mobile banking	Mobile banking	Kim et al. (2009b)
Trust in IT artifacts	Intention to adopt Web-based product-brokering recommendation agents (RAs)	Two RAs, not specified	Komiak and Benbasat, (2006)
Trust in IT artifacts	Relation of trust to satisfaction and continuance of system usage	Microsoft Access	Lankton et al. (2014)
Trust in IT artifacts	An initial trust in an e-commerce context	National Identity system	Li et al. (2006)
Trust in IT artifacts	How to build trust in new technology prior to actual use of the technology	National Identity system	Li et al. (2008)
Trust in IT artifacts	Examine various antecedents of trust to use online prescription filling	Health care: online prescription filling	Liang et al. (2005)
Trust in IT artifacts	Developing measures for trust in technology	Trust in the technology	Mcknight et al. (2011)
Trust in IT artifacts	Developing instrument to measure initial trust in e-commerce	E-commerce	McKnight et al. (2002a)
Trust in IT artifacts	Perceived risk and trusting beliefs, which will directly affect intention to use the exchange	B-to-b electronic commerce	Nicolaou and McKnight (2006)
Trust in IT artifacts	Breakdown and recovery of trust relationships in large-scale system implementation.	Integrated Hospital System	Schlichter and Rose (2013)
Trust in IT artifacts	How companies can build and maintain online trust	Web site	Shankar et al. (2002)
Trust in IT artifacts	Importance of different targets of trust in the context of IS use	A prototype of an IS, called Meet-U	Söllner et al. (2016b)
Trust in IT artifacts	Developing measurement model for trust in IT artifacts	Trust relationships between users and an IT artifact	Söllner et al. (2014)
Trust in IT artifacts	The role of trust in e-government success	E-government Web sites	Teo et al. (2008)

continues

TABLE 1 continues

Target of trust	Topic	Studied system	Reference
Trust in IT artifacts	Preconditions for trust in work-related IS	No specific system	Thielsch et al. (2018)
Trust in IT artifacts	Trust in the IT artifact	Amazon Anywhere m-commerce portal	Vance et al. (2008)
Trust in IT artifacts	Extending the interpersonal trust construct to trust in online recommendation agents	Online recommendation agents created for the experiment	Wang and Benbasat (2005)
Trust in IT artifacts	The evolution of trust using the case of health infomediaries	Infomediaries (online information providers), more precisely health infomediaries	Zahedi and Song (2008)
Trust in IT artifacts, Trust between humans	How humanness of technology affects the trusting belief constructs	Microsoft Access and Facebook	Lankton et al. (2015)
Trust in IT artifacts, Trust between humans	Online sellers trust in online marketplace and in community of buyers	Online marketplace and buyers	Sun (2010)
Trust between humans, organizations, institutions, and IT artifacts	How reliable are the reported results of trust antecedents in IS in terms of measurement model specification	Not specified	Söllner and Leimeister (2013)
Trust in organizations	Trust in global business-to-business (B2B) e-commerce transactions	B2B e-commerce (not specified)	Koh, Fichman and Kraut (2012)
Trust between humans	How feedback mechanisms can influence trust	Online auction market	Ba and Pavlou, (2002)
Trust between humans	Explaining the variation of trust exhibited in online social networks	Facebook	Bapna et al. (2017)

continues

TABLE 1 continues

Target of trust	Topic	Studied system	Reference
Trust between humans	Personalities and personal traits' role in virtual collaboration	Virtual teams	Brown et al. (2004)
Trust between humans	How brain reacts to trust and distrust	Online auction market (not real environment)	Dimoka, (2010)
Trust between humans	The relationship of interorganizational systems use to trust and control	Interorganizational systems and its affect to trust	Gallivan and Depledge (2003)
Trust between humans	Antecedents of trust in global virtual teams	Virtual teams, not specified system	Jarvenpaa et al. (1998)
Trust between humans	Trust in IT-mediated relationships	Between humans	Jarvenpaa et al. (2004)
Trust between humans	Offshore IS vendors' trust in their client	Trust between humans	Mao et al. (2008)
Trust between humans	The critical antecedents for building trust and dependence in IS development	Trust between humans (team members)	Park and Lee (2014)
Trust between humans	The role of behavior control on trust decline in virtual teams	Virtual teams (not specific system)	Piccoli and Ives (2003)
Trust between humans	Trust and knowledge sharing in virtual teams	Virtual teams (not specific system)	Staples and Webster (2008)
Trust between humans	Project team trust and social capital development	Trust between the project team	Tansley and Newell (2007)
Trust between humans	Absorptive capacity (AC), trust (among employees) and information systems influence to product innovation	No specific system, trust between people (departments)	Zhang et al. (2018)

2.3 Trust building

There is no consensus among researchers on how and based on which mechanisms trust is formed.⁶

This chapter explains what kind of process trust is and how it is built. There are not so many studies focusing on trust building per se, so the studies presented here are not limited to any particular field of study. Trust building is a nebulous process, and earlier research has found it to be notoriously hard to define. Trust can be seen as a linear process that starts and evolves into relationship, or it can be seen as a dynamic process that can erupt, slow down, or change (Lewicka, 2022). Here, trust is not seen as a permanent quality; it can be influenced, and it can change, decline, or even stop, so here trust is referred to as a dynamic process. The trust process as a linear or dynamic process, is illustrated in Figure 5. In both processes, trust can be built in the first impression (Büttner & Göritz, 2008); however, it can also evolve over time (Venkatesh et al., 2011). In the dynamic process, changes affect trust to decline or increase, but in the linear process, trust only increases.

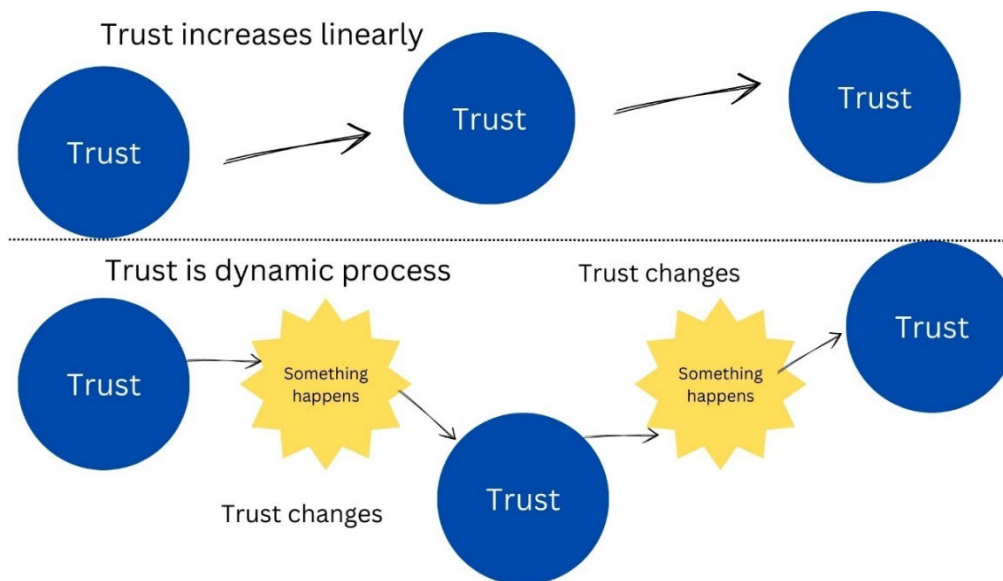


FIGURE 5 Dynamic process of trust

Trust building has been studied in different contexts. Some of the latest studies are about trust building, for example, with nurses and dementia patients (Gjellestad et al., 2022), in a science-based innovation ecosystem (Pattinson et al., 2022) and across identity groups (Herrera & Kydd, 2022). In the field of IS, or trust building in general when information technology is included, the latest research studied trust building in health systems (Adam & Donelson, 2022), in

⁶ Lewicka, 2022, p. 890

crowdfunding platforms (Moysidou & Hausberg, 2020), or in the case of avatars in virtual reality (Luo et al., 2022).

Research findings show that trust can be built by, for example, observing endorsement of similar peers in online stores (Lim et al., 2006), offering a lot of information in the sharing economy platforms (Zhao et al., 2023), or with aspects of sociability, reputation building, and information in product recommendations on social commerce sites (Fang & Li, 2020). Other strategies for building trust are the use of regulations in peer-to-peer platforms (Marth et al., 2022), prompt responses for consumers on Facebook (Nikbin et al., 2022), or via trust transfer from crowdsourcing platform to projects and creators (Moysidou & Hausberg, 2020). Because of the various contexts (see, e.g., the wide range of information systems studied in table 1) of the research studying trust building, various findings have been reached. Trust building methods and strategies may be heavily context dependent, or Lewicka (2022) is right, and trust building mechanisms are not very well understood yet. This indicates that a research gap clearly exists.

Many of the examined studies seem to consider trust-building strategies that can be divided into three themes: those that deal with information, interaction, or trust transfer. However, trust transfer does not really answer how trust was built in the first place; it just notices that if a person trusts something or someone, it can build trust toward other things. Table 2 presents the research findings and how they can be divided into these themes. However, this is not a systematic literature review, and these themes could be further examined. However, this offers hints on how to approach the matter in future studies. Furthermore, these themes can be seen in line with the trust targets in the previous chapter: interaction refers to actions between humans, and maybe even with IS. Trust transfer is often seen from an organization to other targets (e.g., from a trustworthy company to its e-commerce site). Information and how it is presented is the key to building trust in any target, no matter whether it is a person, digital platform, or company.

TABLE 2 Themes in building trust.

Theme	Key research finding	Context of the study	Reference
Interaction	Trust building in positive health system was shown by partnership strength and ongoing motivation.	Health systems	Adam and Donelson (2022)
	Americans took more risks than Japanese, because risk taking is thought to be more essential element for trust building for Americans.	Effects of risk taking on trust building with Americans and Japanese	Cook et al. (2005)

continues

TABLE 2 continues

Theme	Key research finding	Context of the study	Reference
Interaction	Undergoing changes and taking risks during interactions and observing others' behavior help to build trust. Trust is built across groups through interpersonal interactions.	Identity groups: in-group members and out-group members	Herrera and Kydd (2022)
	When rebuilding trust, the source of reason is important. If the violation of trust is not caused by a trustee but by a random situation, then it is more unlikely to occur again, and trust can be rebuilt more easily.	Higher education institutions	Lewicka (2022)
	Avatars with positive expressions were seen as more trustworthy than those with negative expressions. Facial expressions, positive or negative, were seen as more trustworthy than those without facial expression.	Avatars in virtual reality	Luo et al. (2022)
	Prompt responses from the brand in Facebook signal's trustworthiness of the brand.	Brands' Facebook page	Nikbin et al. (2022)
	Connections and networks build trust in science-based SMEs.	Science-based SMEs	Pattinson et al. (2022)
Interaction, Information	Two strategies for online stores to build trust are portal association and satisfied consumer reviews. An effective way to build trust with first-time visitors is the endorsements of similar peers. Dissimilar appearing peers do not have this effect.	Online stores	Lim et al. (2006)
Information	Customers trust for host is positively affected by certification information. The more information the host provides, the more likely is customers' trust.	Sharing accommodation sector	Zhao et al. (2023)
Trust transfer	Results suggest that regulations increase willingness to engage in P2P platform, because they reduce risk perception levels.	Peer-to-peer platform consumers	Marth et al. (2022)
	Trust for the lending platform can transfer to the lending project and the creator, because the crowd-funders assume that the platform controls the projects and creators.	Crowdfunding platforms	Moysidou and Hausberg (2020)

3 RESEARCH APPROACHES AND METHODOLOGIES

Research approach and epistemology of the researcher affect the choices and interpretations of the research (Rashid et al., 2019). In this chapter, the research approaches and epistemologies of this thesis and the articles will be presented and discussed. Next, the methodological choices of this thesis are presented. Finally, the data collection methods are described and analysis methods of this thesis are presented.

3.1 Research approach

Epistemological assumptions are concerned with how knowledge can be created, acquired, and communicated, in other words what it means to know.⁷

Orlikowski and Baroudi (1991) divided research epistemologies into three categories: positivist, interpretive, or critical studies. Positivist epistemology considers that knowledge is absolute, and critical epistemology can be seen as culturally derived (Scotland, 2012). This thesis presents mostly interpretive studies; they examine phenomena in their natural setting (Orlikowski & Baroudi, 1991). However, the first article is an action study and then represents critical epistemology when its objective is to change the way things are participants, which can be seen as part of the desired objective of the study (Scotland, 2012). Other studies in this thesis do not lean so heavily to explicit values, referring here that the first article attempts to change the adoption of digital innovations, and adoption of digital innovation is seen as the desired objective.

Overall, trust is a complex and abstract phenomenon. It is possible to argue that there is a fragmented view of trust in different fields of studies; for example, the constructs it consists of seem to vary (Schilke et al., 2021). This is why the main aim of this thesis is to better understand and create theoretical knowledge.

⁷ Scotland, 2012, p. 9

Articles I and IV also apply and deepen theoretical knowledge. However, testing theoretical knowledge is not within the limits of this thesis. Table 3 presents the research design, approach, data, and analysis of each article.

TABLE 3 Research methodologies of the articles

	Article I	Article II	Article III	Article IV	Article V
Title	Adoption of digital innovations in rural enterprises during COVID-19.	Digital innovations in rural micro-enterprises.	Building trust in the sharing economy: Current approaches and future considerations.	Signaling the trustworthiness of sharing economy platforms: Insights from users' first impressions and platform analysis.	Build trust sensibly.
Research design	Survey study	Action research	Literature review, mapping approach	Think-aloud study, platform analysis	Survey study, design science research
Approach	Creating theoretical knowledge	Applying and deepening theoretical knowledge	Creating theoretical knowledge	Creating theoretical knowledge	Applying and deepening theoretical knowledge
Data	Survey of 149 answers	Memos of the project team (112 pages), a preliminary survey (74 answers), feedback survey from the workshops (474 answers) and follow-up survey (110 answers)	60 articles	12 think-aloud participants, 20 platforms	First test survey 74 answers, next test survey 60 answers, final survey 179 answers, experiences of one platform company (manager & service designer)
Analysis	Cross-tabulation, content analysis	Content analysis	Mapping approach, content analysis	Open coding	Factor analysis

3.2 Collection of data

Collection of the data was done article by article. Article I used a survey to obtain the data. The survey had 25 questions, of which 16 were multiple-choice questions and 9 were open-ended. A survey was completed by 149 respondents. Earlier research suggest that the sample size is adequate. For example, the study of Louangrath (2017) mention that there is variation in recommended sample sizes. Louangrath (2017) wrote that “Kish (1965) recommends 30-200 samples. Sudman (1976) recommends 100 samples”. In addition, Hill (1998) propose that here should be no less than 30 or larger than 500 participants in behavioral studies. Open-ended questions provide qualitative information, and data offer preliminary information. Open-ended questions included, for example, questions asking enterprises to describe what kinds of changes they had made because of the pandemic and what things they did find challenging for their company at the moment of the survey. Multiple-choice questions included, for example, questions about what digital tools they have adopted in the past six months and how much they trusted digital solutions. Digital tools were listed, but they also had the possibility of writing something else. Multiple questions asking about trust had six options (very much, pretty much, to some extent, little, very little, not at all), so the results were based on the experiences of the participants.

For the second article, data were collected during the Digital Path (Maaseudun digitaalinen kasvupolku, Digipolku) project from 2016 to 2019. This article was an action study and used memos and surveys as a collection method: notes from meetings (52 meetings, 112 pages), a preliminary survey collected in the early phase of the project (74 responses), a feedback survey of workshops and events (474 responses) and a follow-up survey after the workshops (110 responses). Action research was chosen as the method because the project aimed at social change (Mahajan et al., 1991; Rogers, 2003). The aim of the project was to support Central Finland’s rural microenterprise adoption of digital innovation. The project organized 43 events or workshops for this purpose, and topics included, for example, social media marketing and webstores. The first survey (74 responses) was conducted before the workshops. It asked participants to evaluate their digital competencies and the needs of their company with multiple-choice questions. The feedback survey also had multiple-choice questions and one open-ended question in which participants could write their thoughts freely about the workshops. Follow-up survey was conducted similarly. All of the surveys were anonymous, and the purpose of the surveys was to evaluate how useful participants thought the workshops were and if they had intentions to take action afterward and then ask if they had done as planned.

Article III was a systematic literature review using the mapping approach (Kitchenham et al., 2010) because its objective was to learn what is already known about trust in the context of the sharing economy. From the review process, we chose only those that were relevant by checking the abstracts of the papers. 60

papers in total were chosen for this review. Key words used in this literature review included the following: trust AND (“sharing economy” OR “peer-to-peer economy” OR “gig economy” OR Uber OR Airbnb). Trust was used in all searches, but the term referring to the sharing economy was changed to find more research. The search words Uber and Airbnb were added to get more results, because sometimes authors were referring to them in the abstract but did not use any other indication for sharing economy. The inclusion criteria were English language and academic journals as publishing channels. Conference publications were excluded, and the search was mainly done in the abstract. There were no temporal criteria, because the sharing economy is quite a new topic. The selection process, databases used, and number of papers found are presented in Figure 6. There was only one article per year in 2013, 2014, and 2015, and most of the articles were published from 2016 to 2019 (9, 11, 26, 11).

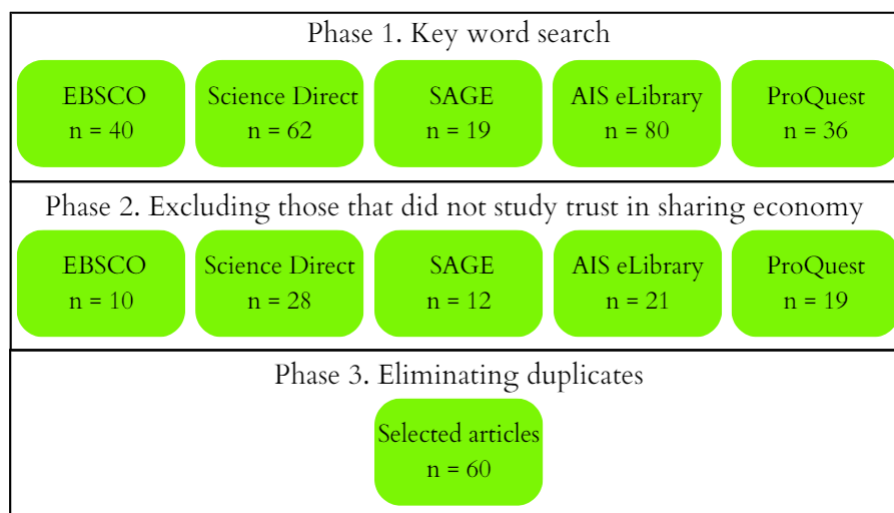


FIGURE 6 Search and selection process for the literature review.

Article IV used two ways of collecting evidence: a think-aloud study and platform analysis. Prior studies have often focused on measuring trust toward something (see, e.g., Hoehle et al., 2012; Kim et al., 2009b; Lankton et al., 2015, 2014; Mao et al., 2008; McKnight et al., 2002a), and many have used students as research subjects (see, e.g., Jarvenpaa et al., 2004; Li et al., 2004; Söllner & Leimeister, 2013; Söllner et al., 2014; Teo et al., 2008; Zahedi & Song, 2008). Just measuring trust with a survey may not tell you why someone trusts something. Furthermore, surveys are retrospective, and think-aloud studies enable the observation of behavior at the same time as it is happening (Lewis, 1982). Think-aloud studies, however, enable the examination of cognitive processes (Kuusela & Pallab, 2000). For example, Ericsson, and Simon (1993) argue that think-aloud studies do not affect the ongoing thought process.

Participants were recruited from a local Facebook group in January 2021. First, they filled out a survey so that demographic information could be collected and that it was possible to see which peer-to-peer platforms participants knew

and which they did not know. In this way, we could choose a platform that was unfamiliar to them. This was essential because the study was about first impressions. Then, the think-aloud protocol was made, and it is illustrated in Table 4. The participants were asked to examine the chosen platform and evaluate the users and posts. These meetings were conducted with Zoom, and videos were recorded so they could be coded afterward.

TABLE 4 The think-aloud protocol

Object of observation	Task for participant
General impression	“You are planning to go camping next summer, but you do not have a tent. Feel free to explore the site as you please and think aloud what you think about it. Ponder if you could rent a tent through the site. Think aloud why/why not.”
Product postings	“Explore the product and its provider. Ponder if you could rent this tent and from this provider. Think aloud why/why not. Ponder aloud what you think about the product and its provider.” This question was repeated three times with different product postings.
Compare the product postings	“If you needed a tent, then which of the previous options would be such that you could rent it and why?”

In next phase purposive sampling was used to select (Emmel, 2013; Sibona & Walczak, 2012) sharing economy platforms that present four categories of the sharing economy: recirculation of goods, increased utilization of durable assets, exchange of services, and sharing productive assets (Schor, 2016). Then, these platforms were checked to see what kind of solutions they used to support users’ trust, and the found solutions were marked in Excel.

In Article V, the survey data were collected in three phases. In the first phase, the survey was tested with students and staff at the University of Jyväskylä (74 respondents). In the next phase, the further developed survey was then tested with users of the real platform (60 respondents) and then with the rental cottage platform (179 respondents). The survey measured the trustworthiness of the company, platform, and other users. Trustworthiness can be divided into three factors: ability, integrity, and benevolence (Akhmedova, Vila-Brunet, & Mas-Machuca, 2021; Büttner & Göritz, 2008; Colquitt, Scott, & LePine, 2007; Gefen & Straub, 2004; Hallikainen & Laukkanen, 2021). The survey had three questions considering each factor (ability, integrity, and benevolence) of the company, platform, and other users (27 questions in total). Questions were made based on earlier surveys of Büttner and Göritz (2008), Colquitt et al. (2007), McKnight et al. (2002), and Mayer and Davis (1999). This article is at its core a design science research article and also uses the experiences of the platform company. The design research process is presented in Table 5.

TABLE 5 Phases of the design research process

Phase	Progression of the design research process
1.	Meetings: discussing about the objectives and ways of achieving them
2.	Developing test survey based on earlier research
3.	Testing and analyzing the test survey
4.	Developing survey for further based on the test survey and its analysis
5.	Analyzing the results
6.	Creating shorter version of the survey
7.	Analyzing the data from the shorter survey
8.	Meeting with research group and the platform company
9.	Workshop for evaluating the trust building solutions with matrix
10.	Developing the design principles of building trust in the digital platform
11.	Evaluating the matrix (discussing with research group and the platform company)
12.	Communicating the results (article)

3.3 Analysis

Content analysis was used in Articles I, II, and III, and open coding with Article IV. In Article I, the data was collected via a survey that had multiple-choice questions and open questions, and cross-tabulation was used with the multiple-choice questions. Content analysis and coding have been used before, for example, to study the use of trust-building measures in B2B e-marketplaces (Son & Benbasat, 2006). Text was coded to categories, and earlier theories were used to limit the number of categories (vs. in open coding, the number of categories might not be limited at all). Content analysis can be used with both qualitative and quantitative data, and it can enable researchers to recognize categories with fragmented knowledge (Miah et al., 2017). Content analysis can be done in a non-automated way by humans or with automated coding by computer software (Gebauer et al., 2008). Here, the content analysis was done by humans without automation because in this way it might be easier to learn more about the context of the study. After all, these articles were part of PhD thesis. For example, Gebauer et al. (2008, p. 366) noted:

Limitations of computerized methods concern validity, as it is difficult for an automated scheme to understand the broader meaning of a text and to recognize the communicative intent of word usage in a specific context.⁸

These studies examined trust which is an abstract phenomenon, and it is useful to see if there are broader meanings in the text.

In Article IV, open coding was used. The text was read, and words and phrases were coded by hand. Open coding is done by labeling and coding meanings from the text. (Hansen & Kautz, 2005). The coding was done by

⁸ Gebauer et al., 2008, p. 366

researchers themselves because “coding constantly stimulates conceptual ideas,” as Holton (2007) writes. Open coding has been used in many IS studies, and it is also part of doing grounded theory (Urquhart et al., 2010). However, this was not a grounded theory study, but it used some of the methods used in the open coding of grounded theory. For example, text was read and coded, keeping in mind two questions: “What is this a study of?” and “What category does the problem incident indicate or what property of the core category does the incident indicate” (Glaser, 2016). Urquhart et al. (2010) have criticized why so many IS researchers use at least partly the coding method from grounded theory but leave the use of grounded theory to that, why they do not develop the theory with this method. For this particular study, grounded theory was thought to be an “too heavy” method because it did not have as much data as grounded theory studies usually have. It would be interesting to hear if others in IS who partially use the coding method but do not really do grounded theory have done so because of the same reasoning.

Article V used factor analysis for the surveys. The initial survey (60 answers) results were insufficient for factor analysis, but after some changes to the survey we were able to collect enough data suitable for factor analysis according (179 answers) to Kaiser-Meyer-Olkin (KMO) Test for Sampling Adequacy suggested that the data was good for factor analysis (.962 is marvellous). We chose the principal axis factoring because it is one of the most used methods in exploratory factor analysis (De Winter, & Dodou, 2012). We found three factors which Eigenvalue is over 1. Cronbach’s alfa of factor 1 was 0.962, for factor 2 was 0.960 and for factor 3 it was 0.955. Cronbach’s alfas values did not increase if any item was deleted. Tables 6-8 present the factors and survey questions. Hypothesis based on the prior research of trustworthiness (Akhmedova, Vila-Brunet & Mas-Machuca, 2021; Büttner & Göritz, 2008; Colquitt, Scott & LePine, 2007; Gefen & Straub, 2004; Hallikainen & Laukkanen, 2021) before using the survey, was that there would be three factors: Trustworthiness of the company, trustworthiness of the other users and trustworthiness of the technology. In addition, the hypothesis was that each of these factors include ability, benevolence and integrity. Findings show three factors, but factor one includes three questions we assumed would go to measure the trustworthiness of the company. This could be because the trustworthiness of the technology and company may be hard to distinguish. Table 9 presents Pattern matrix of these survey questions. Rotation method used was Oblimin with Kaiser Normalization.

TABLE 6 Factor 1: Trustworthiness of the technology

Dimension of trustworthiness	Question in the survey
Company's Ability (CA)	The company behind the platform is able to satisfy its customers' needs
	The company behind the platform is competent
Company's Integrity (CI)	The operations of the company behind the platform are reliable
Technology's Ability (TA)	The technology behind the site works as it should
	The platform works effectively
	The platform supports me in completing what I want to do
Technology's Benevolence (TB)	The platform is developed with the users interests in mind
	The platform provides sufficient information about how to use it
	Using the platform will not harm me
Technology's Integrity (TI)	The platform treats all users with fairness
	The platform is reliable
	The platform operates as it promises

TABLE 7 Factor 2: Trustworthiness of the users

Dimension of trustworthiness	Question in the survey
Users' Ability (UA)	Other users of this site are competent
	Other users of the site are able to complete what they want to do
	I feel confident about the know-how of other users of this site
Users' Benevolence (UB)	My interests are taken seriously by other users of this site
	Other users of this site are transparent about their interests
	Other users of this site would not knowingly do anything to hurt me
Users' Integrity (UI)	I am happy with how the other users behave on the site
	The actions of other users are in line with my expectations
	The other users are truthful in their dealings with me

TABLE 8 Factor 3: Trustworthiness of the company

Dimension of trustworthiness	Question in the survey
Company's Ability (CA)	One can expect good advice from the company behind the platform
Company's Benevolence (CB)	The company behind platform is genuinely interested in its customers' welfare
	The company behind the platform seems to put user's interests first
	One can expect fair treatment by the company behind the platform if problems arise
Company's Integrity (CI)	I am happy with the standards by which the company behind the platform is operating
	One can believe the statements of the company behind the platform

TABLE 9 Pattern matrix of the survey

Statement in the survey	Factor 1	Factor 2	Factor 3
TA: The platform works effectively	0.876	-.083	-.091
TB: Using the platform will not harm me	0.868	0.048	0.232
TA: The technology behind the site works as it should	0.862	-.104	-.066
TI: The platform operates as it promises	0.823	0.162	0.079
TA: The platform supports me in completing what I want to do	0.768	-.005	-.168
TI: The platform is reliable	0.746	0.178	0.012
CA: The company behind the platform is able to satisfy its customers' needs	0.708	-.038	-.315
TB: The platform is developed with the users interests in mind	0.654	0.161	-.166
TB: The platform provides sufficient information about how to use it	0.650	0.169	-.075
CA: The company behind the platform is competent	0.538	0.053	-.345
TI: The platform treats all users with fairness	0.500	0.340	0.036
CI: The operations of the company behind the platform are reliable	0.477	0.265	-.226
UI: The other users are truthful in their dealings with me	-.022	0.986	0.087
UI: I am happy with how the other users behave on the site	0.047	0.934	0.116
UI: The actions of other users are in line with my expectations	0.053	0.905	0.090
UB: Other users of this site would not knowingly do anything to hurt me	-.067	0.822	-.115
UA: I feel confident about the know-how of other users of this site	0.068	0.780	-.069
UB: My interests are taken seriously by other users of this site	0.050	0.710	-.149
UB: Other users of this site are transparent about their interests	-.002	0.677	-.228
UA: Other users of this site are competent	0.058	0.664	-.187
UA: Other users of the site are able to complete what they want to do	0.281	0.530	-.076
CB: The company behind platform is genuinely interested in its customers' welfare	0.104	0.237	-.674
CA: One can expect good advice from the company behind the platform	0.120	0.203	-.659
CI: I am happy with the standards by which the company behind the platform is operating	0.379	0.094	-.535
CB: One can expect fair treatment by the company behind the platform if problems arise	0.242	0.247	-.504
CB: The company behind the platform seems to put user's interests first	0.223	0.286	-.491
CI: One can believe the statements of the company behind the platform	0.344	0.335	-.346

4 FINDINGS

The findings of the presented articles are divided into two categories: trust in the context of the adoption of digital innovations in companies and trust in the context of sharing economy. First, trust in the adoption of digital innovations is examined. After that, trust in the sharing economy is the focus of discussion. Trust in technology is important for effective use of technology (Kivijärvi et al., 2013), and technology adoption is influenced positively by interpersonal trust (Lippert & Davis, 2006). The motives for conducting this research are to first understand the adoption of digital innovations by companies and the importance of trust in them, and then there is a better understanding to plan actions on how platform companies can more effectively improve the platform's trust. Small and nonprofit platforms may not have as good a technological competence as bigger platforms like Uber or Airbnb. They also have fewer resources for further developing the platform. Therefore, we first present findings considering trust in the adoption of digital innovations and then focus on trust in the sharing economy.

4.1 Trust in the adoption of digital innovations

Trust is an important part of the adoption of digital innovations (Lippert & Davis, 2006). The implications of these research findings are that we can positively affect microenterprises' adoption of digital innovations by applying change agents. Here, a change agent refers to a person who attempts to promote change within a certain group (Rogers, 2003). To emphasize the importance of these findings, the EU is funding development projects and research, specifically microenterprises and small and medium-sized enterprises' adoption and use of digital innovations. In Article I, one method for building trust and supporting the adoption of digital innovations was tested and provided promising results. Furthermore, in Article II, it was noted that the company's trust in its own operations, more specifically in its own digital tools, its own future, and its own

partners, could be a background factor in how well the company survives in a changing world. Therefore, it is proposed that change agents should consider building trust from several angles in their operations:

- Trust between the company and the change agent
- Trust between companies; and
- The company's confidence in its own operations

Supporting these angles does not have to be difficult; for example, the workshop concept used a simple cocktail-party facilitation method, which is described in Figure 8. However, this does not solve all trust issues. Other solutions for change agents to build trust could be supporting networks, for example, organizing events that take into account networking with other companies and supporting companies' trust in their own operations. However, this is not intended to give a false sense of trust, as that could have a harmful effect if the digital innovation in question would, for example, be too expensive for the company or not useful for them. It is not a matter of blindly supporting the adoption of innovations, but of supporting companies to adopt useful innovations for them. Next, the findings of Articles I and II are presented more closely.

4.1.1 Article I: Trust and adoption of digital innovations in changing situation

Räisänen, J., & Tuovinen, T. (2021). Adoption of digital innovations in rural enterprises during COVID-19. In Leick, B., Gretzinger, S., & Makkonen, T. (Eds.), *The Rural Enterprise Economy*. New York: Routledge, 53-71.

RQ1 Does trust affect how well a company copes with changing situations? (Article I)

In the spring 2020 outbreak of COVID-19 challenged companies all over the world. One way to survive a situation in which face-to-face meetings were avoided was to digitalize operations or develop new digital services. Rural microenterprises had more problems than urban companies because their skill levels could potentially be lower (Salemink et al., 2017). Another reason could be proposed by Lippert and Davis (2006), who suggest that individual's willingness to adopt innovation is affected by their trust in others and trust in IT. This paper's objective was to examine whether trusting individuals cope better with change during COVID-19, especially when adopting new digital innovations. Lippert and Davis (2006) proposed that interpersonal trust and trust in technology positively affect technology adoption. Illustration of this model is presented in Figure 7. These individuals represent mostly rural microenterprises (93%). In addition, the paper is interested in trust in technology, other people, and the future, and how microenterprises have adopted new digital innovations because of the COVID-19. This study used survey data collected from a total of 149 respondents from Finnish companies.

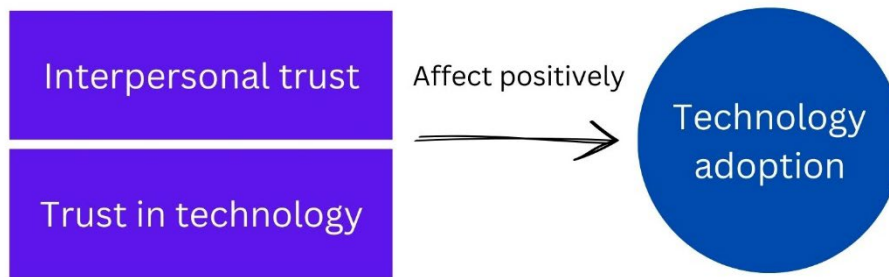


FIGURE 7 Illustrated model of technology adoption by Lippert and Davis (2006)

The results suggest that COVID-19 forced Finnish companies to adopt new digital innovations. 47% of the respondents reported that they adopted new digital innovations because of the COVID-19 outbreak and they would not have done this otherwise. Most of the companies (66%) answered that they had difficulties in their operations in the spring of 2022. The results suggest that those who were trusting their own company’s future and in their own future were performing the same or better than the previous year. Companies that were eager to digitalize their operations reported that their companies were performing better than those that were less eager to digitalize. However, the individuals who were coping with change better did not necessarily trust others more than those who were not coping that well. Preliminary findings of this study are illustrated in Figure 8.

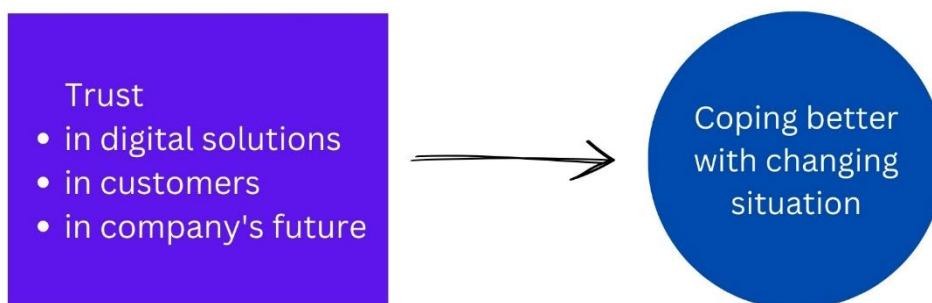


FIGURE 8 Preliminary findings that trust enhances coping with changing situation

4.1.2 Article II: Trust building and adoption of digital innovations

Räisänen, J., & Tuovinen, T. (2020). Digital innovations in rural microenterprises. *Journal of Rural Studies*, 73, 56-67.

RQ2 Does the workshop concept supporting trust building, information sharing, and networking affect the adoption of digital innovations in microenterprises? (Article II)

The motivation for this research is derived from the Digital Path project (Maaseudun digitaalinen kasvupolku, EU-funded development project) that was coordinated by the University of Jyväskylä. The project ran from February 2016

until the end of 2019. The project's aim was to support rural microenterprises in adopting digital innovations to improve the competitiveness of micro-enterprises in Central Finland. Rural areas have lower skills and education levels, and data infrastructure is often also poorer (Salemink et al., 2017). The digital divide between rural and urban areas negatively affects the whole nation's economy (Veselovsky et al., 2018). Small and medium enterprises have invested less in digital technologies than larger companies, so they have more difficulties with digital transformation (Ben et al., 2017).

To improve the adoption and diffusion of digital innovations, the project developed a workshop concept. The concept includes four steps:

- 1) Trust building
- 2) Lectures by experts
- 3) Examples of Peers
- 4) Participation in workshop tasks

These steps were supported by theories examining digital innovation adoption and diffusion. The first step was inspired by Roger's (2003) diffusion of innovation theory and the idea that change agents need to be trusted by the participants. Trust building was done with an easy-to-use facilitation method called a cocktail party. This facilitation method is described in Figure 9. The next step, lectures by experts, was supposed to introduce the digital innovations to the participants. The second step of the workshop was supported by the TAM (Davis et al., 1989): participants' perspective of perceived ease of use and usefulness of the innovation is relevant for the adoption of digital innovation. The third step, the example of peers, was inspired by the UTAUT and the importance of social influence (Venkatesh et al., 2003) and Roger's (2003) diffusion of innovation theory and the idea of opinion leaders and that it is easier to communicate with similar people (in this case, a local well-known entrepreneur or company). The fourth step offered participants the possibility to think about how they could use digital innovation themselves. It was also meant to give them the possibility to evaluate whether the innovation was useful for them, because it was not desirable that every participant adopt every innovation. Sometimes, digital innovations are not suitable for all (Rogers, 2003).



FIGURE 9 Cocktail party facilitation method.

When the paper was written, the project organized 43 events or workshops in 18 different locations in Central Finland. There were approximately 800 visits to these workshops. We evaluated how well the workshop concept worked by collecting feedback from the workshops. We were especially interested in seeing if workshops had an effect on the actions of the participants. After the workshop, 90% of the 413 respondents in the feedback survey said that they were quite likely (190) or likely (181) that they would take action after the workshop. After the workshop, there was a new survey asking if the participants had taken the action they planned in the workshop. 36% (39 from 108 persons) said that they had done the action they planned. Of 105, 32 answered that they had done some other action inspired by the workshop.

The article presents a real-life case of how the adoption of digital innovation can be supported in rural areas for microenterprises with free workshops. Workshop concept was developed and tested. Workshops worked especially for spreading information, fostering a positive attitude, and planning how these digital innovations can be used by the participants. Workshops affected the adoption of digital innovations, but because there were fewer answers to the survey after the workshops, it was impossible to see the real effects. The paper suggests that essential for supporting the adoption and diffusion of digital innovations is to especially consider communication, opinion leaders, change agents, and trust. In the beginning of the project, trust was assumed to be important, so it was considered when the project team was planning the workshops. However, what came as a surprise was that it was not only trust between the project team and the participants that was important. In addition, trust between participants was essential, especially when they were brainstorming, because they were afraid that others would steal their ideas.

In conclusion, the paper recognizes the importance of trust building in the adoption of digital innovations and tests one way to promote diffusion and adoption of digital innovation with workshops. Results suggest that the concept has an impact and that trust building with both change agents and participants

and between participants is important. Figure 10 illustrates the workshop concept and the changes that were seen after the workshops.

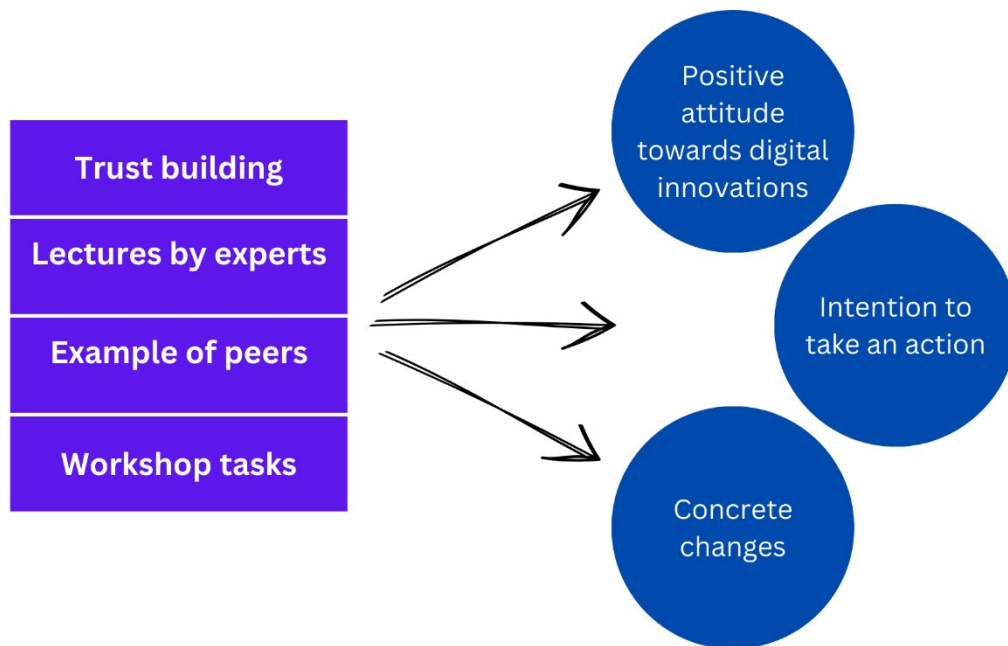


FIGURE 10 Illustration of the workshop concept and its suggested effect

4.2 Trust in a sharing economy

Research papers III and IV broadly examine trust in the sharing economy. Article III recognizes many solutions that build trust in the sharing economy. In addition, Article IV proposes that trust in the sharing economy is multidimensional: there are three targets of trust: company, platform or technology and other users. Smaller or non-profit platforms cannot afford to use that many solutions to build trust. Based on these studies, in Article V, we developed a matrix that we preliminary tested with a sharing economy company. The matrix is presented in Figure 11. We used trust-building solutions from the earlier studies (Articles III and IV), and the company itself evaluated the investment and technical complexity of these solutions. The tool used with the company could be an opportunity for smaller and nonprofit companies to decide which solutions they want to implement on the platform. When choosing solutions, you can also take into account the differences between the platforms (Figure 12) that were noted in Article IV because it seems that different sources of trust are more important for different platforms.

4.2.1 Article III: Factors affecting trust in the sharing economy

Räisänen, J., Ojala, A., & Tuovinen, T. (2021). Building trust in the sharing economy: Current approaches and future considerations. *Journal of Cleaner Production*, 279, 123724.

RQ3 What can be learned from earlier research about trust building in the context of the sharing economy? (Article III)

RQ4 How can trust be built in the sharing economy? (Article III)

Prior research suggests that trust and safety are reasons why some sharing economy platforms fail (Chasin et al., 2018), and trust in other users is essential for usage of the platform (Hawlitschek et al., 2018). Sharing economy can also be more sustainable than traditional businesses because it does not require owning things. This literature review's objectives are to identify if and how reviewed studies define trust, what has been studied earlier considering trust in the sharing economy, what kinds of solutions have been used or studied to build trust in the sharing economy, and how users can evaluate trust in the sharing economy platforms.

The systematic literature review uses the guidance of Webster and Watson (2000) and uses the mapping approach (Kitchenham et al., 2010); the study is used to identify what is known about trust in the sharing economy. Sixty papers were chosen for the study. An alarming finding is that not even half of these studies defined trust (24 define it). Trust is an abstract term that can be defined differently. When studies do not clearly define them, it is possible that the research can be understood differently than it was meant to.

The chosen articles in the literature review can be categorized into four categories: 1) those that consider ways platforms can support trust building; 2) those that examine the impact of trust on platform users; 3) those that explore the user's trust toward the platform or the company; and 4) those that consider trust as the core of the sharing economy. Based on this categorization, the paper presents a preliminary model that can be used to evaluate the user's trust in the sharing economy platform. The preliminary model (Figure 11) suggests that four aspects should be evaluated: 1) what kind of solutions a platform uses to support user's trust, 2) how users can interact with each other's, 3) how much user's trust the platform, and 4) how much users trust the company/organization. In addition, the review recognizes 28 solutions from the literature that can also be used to support trust building in sharing economy platform. These findings can be applied to study in greater depth how sharing economy platforms can find a balance between security, trust, and ease of use.

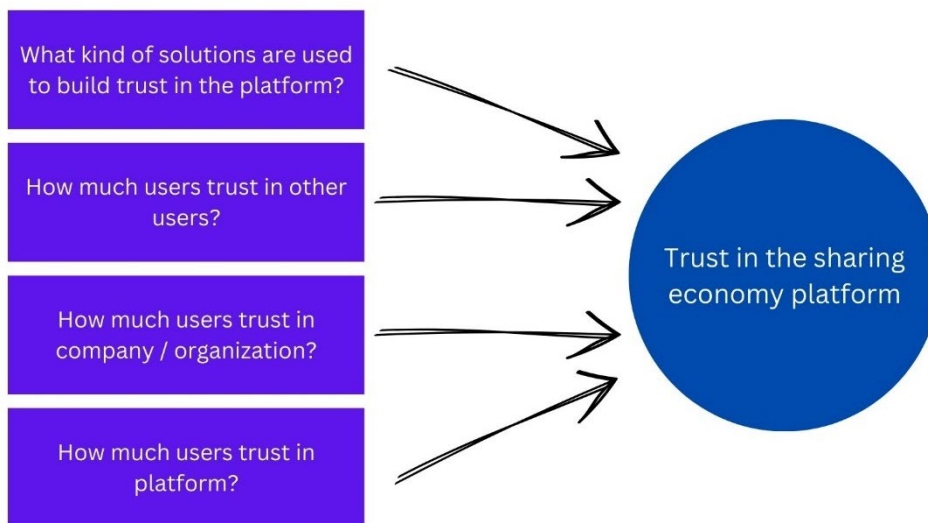


FIGURE 11 Preliminary model of which aspects affect trust in the sharing economy platform

4.2.2 Article IV: Signaling the trustworthiness of the sharing economy platform

Mähönen, J., Ojala, A., & Chandra Kruse, L. Signaling the trustworthiness of the sharing economy platforms: Insights from users' first impressions and platform analysis. (Under review.)

RQ5 How do first-time users evaluate the trustworthiness of the sharing economy platforms? (Article IV)

RQ6 How do sharing economy platforms signal trustworthiness for users? (Article IV)

Trust plays a vital role in the sharing economy platforms. It affects user's intention to share in the sharing economy platform (Hawlitschek et al., 2018) and their purchase intention (Kim & Benbasat, 2006). This study aims to understand trusting beliefs that are referred to here as trustworthiness (Kim & Benbasat, 2006) of peer-to-peer platforms. These findings can be used with other kinds of digital platforms, but here, we focus on peer-to-peer platforms. Peer-to-peer platforms are online services where users can obtain, share, or give access to assets or services to another user (Hamari et al., 2016). This study focuses on first-time users' perspectives of trustworthiness and the question of how platforms can signal their trustworthiness in practice.

This paper uses two methods to achieve its objectives. First, a think-aloud study is used to recognize how first-time users evaluate the trustworthiness of the peer-to-peer platform, and then platform analysis of twenty platforms is done to see what kind of solutions platforms use in practice. Think-aloud study had 12 participants who had not used the chosen peer-to-peer platform before, which is referred to here as "Rent-A-Camp" (name changed). Participants were asked to use the platform and think aloud about what they thought during the process.

Platform analysis was conducted using purposive sampling of 20 platforms. Their solutions for trust building are checked and coded to better understand what kinds of solutions different kinds of platforms are using in real-life settings. The findings suggest that there are two strategies for first-time users to evaluate the platform's trustworthiness: they check the front page and then evaluate the other users and their posts, or they check the front page, then the company information, and then they evaluate other users. This indicates that there are three dimensions of trustworthiness that first-time users evaluate: trustworthiness of the technology, the company, and the users. Prior research shows that trustworthiness is affected by ability, benevolence, and integrity (Akhmedova et al., 2021; Büttner & Göritz, 2008; Colquitt et al., 2007; Gefen & Straub, 2004; Hallikainen & Laukkanen, 2021), and this study proposes that these factors should be evaluated from different dimensions of the platform's trustworthiness: from the perspective of the technology, the company, and the users (illustrated in Figure 12).

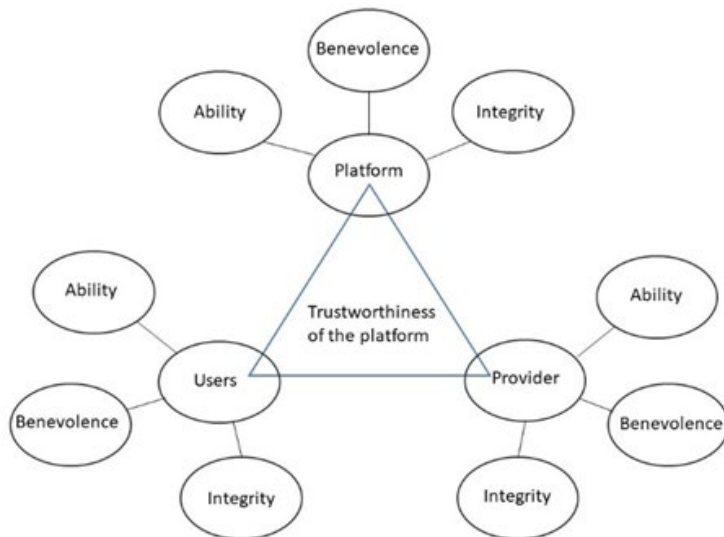


FIGURE 12 The multisided perception of trustworthiness of the sharing economy platform.

Furthermore, the platform can present its trustworthiness by using three kinds of signals: immediate signals, reputation signals, and safety signals (illustrated in Figure 13). Immediate signals refer to those that first-time users can see right away, reputation signals refer to those that present a good reputation, and safety signals refer to those signals that make the user feel safe. Safety signals are prioritized more when there is a bigger monetary risk, and reputation is at most importance when dealing with knowledge or creativity. However, all kinds of platforms presented in this paper seem to value the most to signal the trustworthiness of their users (the number of solutions in this category overall). The research also recognizes that different platform types have different priorities with preferred trust-building solutions (presented in Table 10).

Signals of platforms trustworthiness

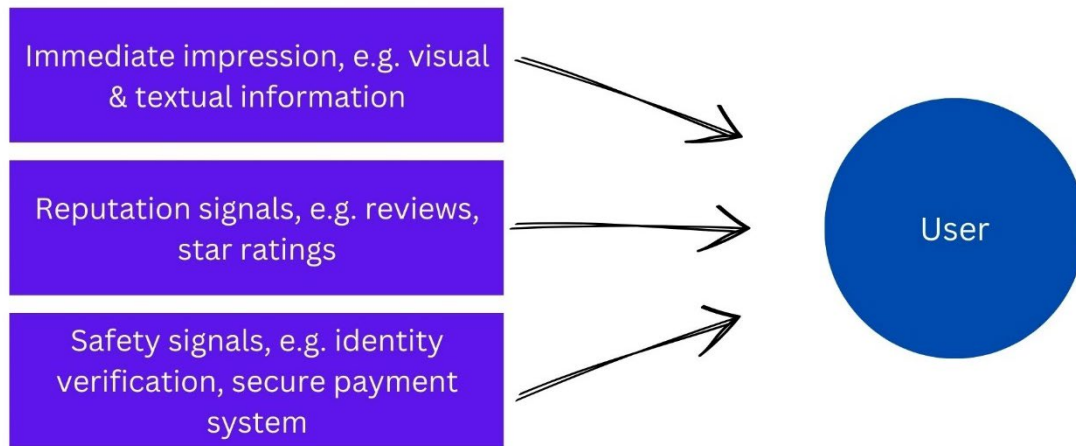


FIGURE 13 Three signals of platforms trustworthiness.

TABLE 10 Priorities of trust-building signals for different platform types.

Platforms	Immediate signals	Reputation signals	Safety signals
Recirculation of goods	first priority	second priority	third priority
Sharing productive assets	second priority	first priority	
Increased utilization of durable assets	first priority	third priority	second priority
Exchange of services			

4.2.3 Article V: How to build trust in the sharing economy, but also consider the resources of the company

Mähönen, J. Build trust sensibly. (Under review.)

RQ7 How to not only build trust in the sharing economy but also consider the resources of the company? (Article V)

RQ8 How can trustworthiness in the sharing economy platform be measured? (Article V)

The goal of this article was to offer platform developers and managers tools to help them decide how to enhance the platform's trustworthiness. Trust is important for sharing economy platforms because it affects the use of the platform (Hawlitschek et al., 2018) and intention to continue using the platform

(Arteaga-Sánchez et al., 2018; Lee et al., 2018). Earlier research has found that there are many trust-building solutions that work in the sharing economy. For example, identity verification (see, e.g., Zloteanu et al., 2018; Xie et al., 2019), reviews (see, e.g., De Rivera et al., 2017; Thierer et al., 2016; Xie et al., 2019), and other reputation signals (Abrahao et al., 2017; Bente et al., 2014) affect trust positively. However, sharing economy platforms have different operation logics, and trust building in all types of platforms may not be uniform. In addition, big international platforms and small local platforms or nonprofit platforms have different resources to implement trust-building solutions. To help especially smaller platforms decide which trust-building solutions are a good option for them, we designed a matrix that considers the investment needed to implement the solution and the solutions' technical complexity. In addition, we developed a survey to measure the trustworthiness of the platform.

The survey measuring the trustworthiness of the platform is based on the earlier research. The survey items of Büttner and Göritz (2008), Colquitt et al. (2007), Mayer et al. (1995), Mayer and Davis (1999) and McKnight et al. (2002a) are used as a base and are transformed in the context of the sharing economy. Sharing economy is seen here as multidimensional and questions measure the trustworthiness of the platform (technology), the company behind the platform and the users of the platform. The survey was developed in three phases. In the first phase, the survey was tested with students and staff of the University of Jyväskylä (74 answers), then with users of real platform 8 (only 60 answers), and then with the rental cottage platform (179 answers). With factor analysis, we recognized that there are really three factors when measuring the trustworthiness of the sharing economy platform.

To help platform companies evaluate trust-building solutions, we divided trust-building solutions into three categories: those that are seen as the first impression of the platform, those that signal reputation, and those that ensure a feeling of safety. The matrix is simple in design because we thought it should be easy to use. It has two axels: investment and technical complexity. The idea is that platform companies can evaluate trust-building solutions from their own perspectives. An empty matrix for evaluating trust-building solutions supporting first impressions of the platform is presented in Figure 14. The matrix was tested with a real platform company, and they thought it was an eye-opening experience. Trust plays a vital role in the sharing economy platforms. It affects user's intention to share in the sharing economy.

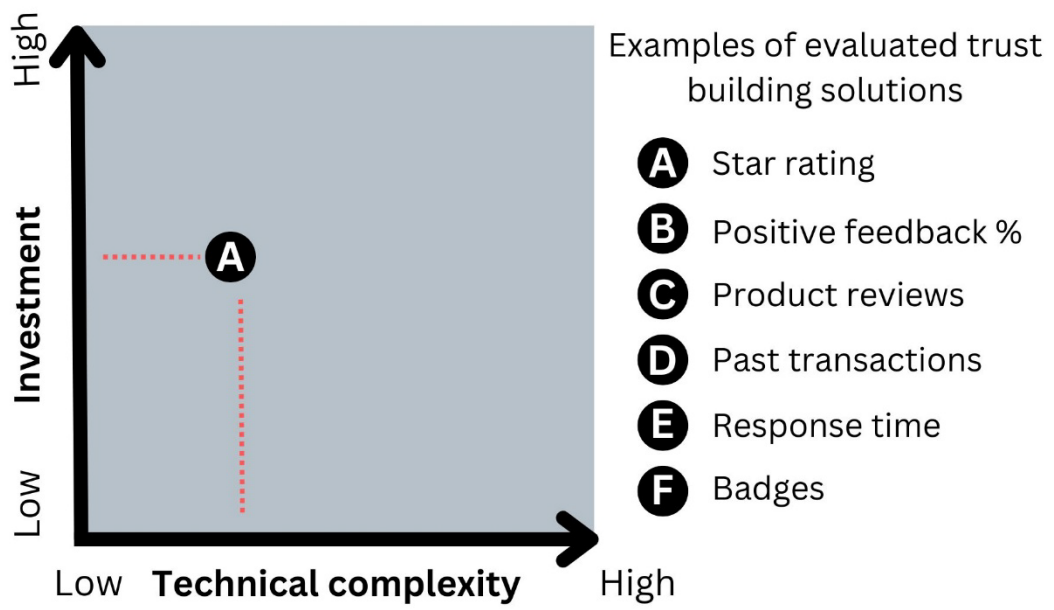


FIGURE 14 The matrix tool for evaluating investment and technical complexity of trust building solutions.

5 DISCUSSION

An understanding of trust in the context of digital innovations and in the context of digital platforms has clear importance for the practical world because it will help to ensure better actions to support the adoption of innovations and it can lead to more trustworthy digital platforms. In addition, the topics and research presented in this thesis can have an eminent impact on theoretical development. This chapter first presents the specific research questions that this thesis aims to answer and then discusses their theoretical and practical implications. Then, the limitations and future research of the topics within this thesis are examined. Finally, this thesis is concluded.

5.1 Theoretical implications

The research questions and their answers are presented in Table 11. Discussion of research findings is divided into two themes: those findings that examine trust building and adoption of digital innovations, and findings that examine that trust building in the sharing economy. Next, the theoretical implications of Articles I and II are presented more closely, and then the theoretical implications of Articles III to V.

TABLE 11 Summary of the research questions and findings.

Research question	Findings
RQ1: Does trust affect how well a company copes with changing situations? (Article I)	Results present that COVID-19 pandemic forced Finnish companies to adopt new digital innovations. The survey results suggest that those who were trusting their own company's future and in their own future were performing the same or better than the year before. Companies that were eager to digitalize their operations reported that their companies were performing better than those that were less eager to digitalize. However, the individuals who were coping with change better did not necessarily trust others more than those who were not coping that well.
RQ2: Does the workshop concept supporting trust building, information sharing, and networking affect the adoption of digital innovations in microenterprises? (Article II)	The paper recognizes the importance of trust building in adoption of digital innovations and tests one way to promote diffusion and adoption of digital innovation with free workshops. Workshop concept that included four steps: 1) trust building, 2) lectures by experts, 3) examples of peers, and 4) participation in workshop tasks. Workshops had an impact on participants' attitudes toward change and the adoption of digital innovations.
RQ3: What can be learned from earlier research about trust building in the context of the sharing economy? (Article III)	There is lack of definition of trust with research papers examining trust in the sharing economy. Not even half of the papers defined it (24/60). Research considering trust in the sharing economy could be divided into four groups: 1) those that consider ways platforms can support trust building; 2) those that examine the impact of trust on platform users; 3) those that explore the user's trust toward the platform or the company; and 4) those that consider trust as the core of the sharing economy. In addition, the review recognizes 28 solutions from the literature that can be used to build trust in the sharing economy platform.
RQ4: How can trust be built in the sharing economy? (Article III)	The paper creates preliminary model to evaluate trust in the sharing economy. Four aspects should be evaluated: 1) what kind of solutions a platform uses to support user's trust, 2) how users can interact with each other's, 3) how much users trust the platform, and 4) how much users trust the company/organization. By improving these, trust can be built in the sharing economy.

continues

TABLE 11 continues

Research question	Findings
RQ5: How do first-time users evaluate the trustworthiness of the sharing economy platforms? (Article IV)	First-time users use three kinds of signals when evaluating the trustworthiness of the sharing economy platform. These are immediate signals, reputation signals, and safety signals. In this study, the most important signals of trustworthiness (the signal that was most paid attention to) for first-time users were reputation signals, for example, reviews of others, and immediate signals, for example, visual, and textual information of the product).
RQ6: How do sharing economy platforms signal trustworthiness for users? (Article IV)	Platform’s trustworthiness is multisided. It encompasses three aspects: the trustworthiness of the technology, the trustworthiness of the users, and the trustworthiness of the company. Each aspect consists of three dimensions: ability, benevolence, and integrity.
RQ7: How to not only build trust in the sharing economy but also consider the resources of the company? (Article V)	Matrix considering investments needed from the company to implement trust-building solutions and solutions technical complexity from the company’s point of view, is presented as a tool for this. The matrix was tested in a real-life setting with a platform company and was evaluated positively by the company.
RQ8: How can trustworthiness in the sharing economy platform be measured? (Article V)	Survey measuring sharing economy platform’s trustworthiness consider trustworthiness of the platform (technology), company and the users is presented as a tool for this. The survey used earlier research and was tested in a real-life setting.

5.1.1 Trust building and adoption of digital innovations

Trust as part of the adoption of digital innovation has been noted in earlier research (see, e.g., Lippert & Davis, 2006; Nwaiwu et al., 2020). Changing situations, such as the foot and mouth disease outbreak in the United Kingdom in 2001 and the 2007–2008 financial crisis (Phillipson et al., 2020), affect the operations of companies. COVID-19 forced companies to digitize their operations at a rapid pace while trying to avoid physical contact or meetings. This was also noted in Article I. Changes are also likely in the future, even if we do not yet know what they will be caused by. For example, climate change will affect our lives and the operations of companies. Results of the survey in Article I suggest that companies trusting their own company’s future and in their own future were performing the same or better than the year before. Companies that were eager to digitalize their operations reported that their companies were performing better than those that were less eager to digitalize. However, 149 respondents were not presentative of Finnish companies, so this should be studied more.

Companies that are small- or medium-sized have invested less in digital technologies than bigger companies and are having more difficulties with digital

transformation (Ben et al., 2017). In Article II, we developed a workshop concept to support the adoption of digital innovation in companies. It is based on earlier research of Roger's (2003) on innovation diffusion, TAM by Davis et al. (1989) and the UTAUT and the importance of social influence (Venkatesh et al., 2003). The developed workshop concept was effective especially for spreading information, fostering a positive attitude, and planning how these digital innovations can be used by the participants. In addition, workshops had a positive impact on the adoption of digital innovations. To conclude, my preliminary findings in Article I suggest that a person's disposition to trust may affect how well he or she copes with changes in the environment, such as COVID-19. Other important factors to build trust and support the adoption of digital innovations are in line with three themes I found in Chapter 2.3. Building blocks of the workshop concept included information (lectures by experts), interaction (networking with peers, workshop tasks, and trust-building activities), and trust transfer (the role of change agents, peers and/or experts). Although this observation was made during the work of this thesis and should be tested, I propose that the key elements in building trust are information, interaction, and trust transfer (Figure 15).

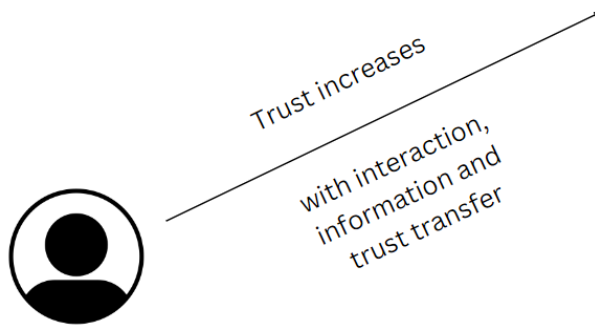


FIGURE 15 Illustration of trust increasing with interaction, information, and trust transfer

5.1.2 Trust building in the sharing economy platform

The thesis provides new knowledge and thus expands the existing field of research on trust in the sharing economy. Trust building in the sharing economy has been studied to some extent, especially in recent years. These studies highlight the importance of trust for many reasons. For example, research by Arteaga-Sánchez et al. (2018), Lee et al. (2018) and Hawlitschek et al. (2018) have found that trust is important issue in the sharing economy. Usually, these studies concentrate on only a few trust-building solutions (see, e.g., Ert et al., 2016; Nikbin et al., 2022; Wang et al., 2019; Yang et al., 2018). Article III is a useful addition to these studies because it recognizes a wide range of trust-building solutions and introduces what earlier research has found about trust building in the sharing economy. The number of trust-building solutions recognized in Article III challenges the idea that we already know the answer to how to best

build trust on sharing economy platforms. Article IV continues from this and more precisely identifies that different platforms have different priorities in building trust. However, earlier research has used different ways to categorize sharing economy platforms (see, e.g., Constantiou et al., 2017; Martin, 2016), so it does not necessarily cover all kinds of sharing economy platforms. Even so, the trust-building priorities of the sharing economy platforms are useful knowledge when extending the research. Article IV divides trust-building solutions from the perspective of what they signal to users: immediate impression signals, reputation signals, and safety signals. This division of signals is exploited in Article V to help consider which signals platform companies want to focus on. The key result of the use of trust-building solutions is the matrix presented in Article V. Its purpose is not to answer what the best solution is to build trust. It offers a way for small platform companies to choose what they are ready to do for trust building. The matrix is used to evaluate how much investment is needed to implement different trust-building solutions and to evaluate how technically complex they are from the company's point of view. This is a new perspective for trust building in the sharing economy.

Earlier research measured trust or trustworthiness in e-commerce (see, e.g., McKnight et al., 2002b; Sun, 2010). For example, the study of Mittendorf et al. (2019) examined trust in customers and trust in service providers. However, we propose that the trustworthiness of the sharing economy has three dimensions: trustworthiness of the company, trustworthiness of the platform (technology), and trustworthiness of the users (other users). In Article V, we developed a survey that takes into account all of these dimensions. It was tested, and we recognized with factor analysis that there really were three factors. However, all the questions in the survey did not go to factors that we thought they would, so the survey could still be developed further. In any case, however, it can already be used to evaluate the platform's trustworthiness, and it offers new tools for future research.

Article IV examines how first-time users evaluate platforms' trustworthiness through a think-aloud study. Article IV recognizes two strategies for evaluating the trustworthiness of the platform: they check the front page and then evaluate the other users and their posts, or they check the front page, then the company information, and then they evaluate other users. Many of the studies of trust in the sharing economy are conducted with surveys (see, e.g., Hoehle et al., 2012; Kim et al., 2009a; Lankton et al., 2015, 2014; Mao et al., 2008; McKnight et al., 2002b) or with students (see, e.g., Jarvenpaa et al., 2004; Li et al., 2004; Söllner et al., 2014; Söllner & Leimeister, 2013; Teo et al., 2008; Zahedi & Song, 2008). Think-aloud study widens the theoretical knowledge, and the research method helps to view the research topic in a new way.

Trust can be defined in various ways, and the term is abstract and sometimes difficult to understand. This is why it should always be somehow defined in research. Article III finds that not even half of the studies in the literature review define trust. In moving the research forward, illustrating this deficiency is important. Hopefully, recognizing this lack of definition helps to

ensure that it is considered in future studies better. This can also be a good observation for the reader of scientific research, and the reader can pay attention to whether trust is defined in the research or not.

5.2 Practical implications

This thesis has several implications for practice. The findings of this thesis can be used by companies and, for example, by change agents. Next, we will discuss the practical implications of trust in the context of adoption of digital innovations and then discuss it in the context of sharing economy.

5.2.1 Trust in the context of adoption of digital innovation

The survey results from Article I suggest that those who were trusting their own company's future and in their own future were performing the same or better than the previous year. It is important to note that, when supporting the change of companies, their trust in their own operations can be of great importance. This can also be supported, for example, by how things are presented. This could also be an important consideration for those working with companies, such as change agents.

Workshop concept developed in Article II was working well for enhancing the adoption of digital innovations. Change agents can also use this model in the future to improve the adoption of digital innovations. In this concept, trust building was made with an easy-to-use facilitation method called a cocktail party. This is a simple way to build trust, and the method does not require special skills—just the courage to try.

5.2.2 Trust in the sharing economy platform

The literature review in Article III presents many different solutions for trust building in the sharing economy. Article IV proposes that a sharing economy platform can present its trustworthiness by using three kinds of signals: immediate signals, reputation signals, and safety signals. By dividing trust-building solutions into different signals, we can help companies understand what different solutions can be used and make it easier to select suitable trust-building solutions for the platform. The matrix designed in Article V offers a way for platform companies to evaluate trust-building solutions according to their resources. This is useful especially for smaller (national or local platforms) or nonprofit platforms, which cannot afford such a large number of trust-building solutions. For them, the decisions to implement trust-building solutions have to be made by taking the resources (how much they can put money and what kind of technical skills they have) into account. Article V offers a ready-made survey that can be used to measure trustworthiness in the sharing economy platform. The company can evaluate the factors of trustworthiness simply with the help of

survey software, such as Webropol, because the averages can be obtained from factors directly, so they are fairly easy to use. The only special skill, from the company's point of view is that it requires the use of survey software.

5.3 Combining perspectives

In this section the findings of the five articles are combined to a model which can be used to support especially small or non-profit platforms to develop their trust building mechanisms. This model is preliminary and not tested and only theoretical in this point. The first article of this thesis suggests that companies that are more trustful to their own operations and more willingness to use new digital solutions when needed. Firstly, it might be useful to understand the operation environment of the company and the attitudes towards change. The workshop model of the Article II was recognized as a useful method so here the concept is used as base for the development of the virtual workshop. Phases of this combined model are presented in table 12.

TABLE 12 Model to support platform companies to build trust.

Phase	Action	Actors
1.	Examination of the company's operating environment and attitudes towards change	Researcher / change agent
2.	Survey of the platforms trustworthiness for the platform users	Researcher / change agent
3.	Virtual workshop: creating trust between participants information about the importance of trust examples how other platforms have built trust (examples of peers) evaluation of solutions with the created matrix deciding which trust building solutions to implement	Researcher / change agent & platform company
4.	Implementation of the trust building solutions to the platform	Platform company
5.	Survey of the platforms trustworthiness for the platform users	Researcher / change agent
6.	Evaluating whether trust has improved and whether the assessment made with the matrix was helpful.	Researcher / change agent & platform company

The motivation of this section was to show reader how findings of this thesis come together. However, it should be noted that this preliminary model is not entirely tested yet. Survey of the platform's trustworthiness for the platform users and the virtual workshop for the platform company and the evaluation of the workshop were done in the Article V, but this could have been taken further if schedules would have allowed it.

5.4 Limitations

One limitation of the research conducted within this thesis, is the sample size. A larger sample size would be more representative of the target population. In Article I, data from Finnish companies was collected using a survey, and a survey was used in Article V. A larger number of survey respondents would have made the results more generalizable. However, in both studies the number of responses were over 100 which exceeds threshold suggestion by Kotrlik and Higgins (2001), who argue that sample size should not be less than 100 for survey studies that aims to use factor analysis. The think-aloud study had 12 participants, so the study could have benefited from larger data. On the other hand, Nielsen (1994) has stated that even four to five participants are enough. In Article V, 20 sharing economy platforms were observed. Again, like with the survey studies, more companies would have increased the generalizability.

Another limitation was that all of the articles could have benefited from the triangulation of data and analysis. Through triangulation, the results of the thesis could have been more enriched. With the observations in Article IV, as observations were subjective by the observers, there could have been the possibility of self-interpretations, misunderstandings or something may have been missed. However, it is likely that adding one or two trust-building solutions to the list would not made a big difference. In Article V, matrix was developed to evaluate trust-building solution implementation (see 4.2.3 Article V). However, this matrix was tested with one platform company. It was evaluated as a useful tool, but the matrix could have been studied in more depth to emphasize its true value and answer, does it enhance the trustworthiness of that platform, and do other platform companies see it as a useful tool.

A further limitation is that with regards to a research topic like trust, there are a multitude of factors that can impact it. For example, culture affects trust in technology (Vance et al., 2008) and tendency to trust, for instance, some cultures are more trustful than others. This thesis examined only Finnish participants; therefore, future researchers could apply the survey to obtain a more extensive and more comprehensive sample and get more generalized results. This will be discussed further in the next section.

5.5 Future research

Trust is not an unproblematic research topic. Table 13 presents the research topics and questions for future research. First, there are problems in how it is defined (see, e.g., Article II or discussion about digital trust in Chapter 2.1.1.). This challenge can be met by defining what the author means when discussing trust, but the problem of how, for example, different nationalities understand trust is not answered so easily. This challenge could be researched by asking research participants to define what they mean by trust and if they see it differently from

the context of trust (e.g., interpersonal trust between coworkers or trust in the Internet community). However, this should be studied with a large sample size and an international study.

Building trust is important, for example, to digital platforms (see for example Arteaga-Sánchez et al., 2018; Hawlitschek et al., 2018; Lee et al., 2018), but trust can also have a harmful effect if it is misplaced. A challenge in the digital context can also be skilled fraudsters who understand how to build trust and exploit this knowledge. Some trust-building solutions, such as reviews and ratings, may be so effective because they show that there has not been fraud before. However, this does not eliminate all chances of being cheated on. Feng et al. (2004) proposed that online interpersonal trust is positively affected by empathic accuracy and response type, so persons who can communicate more emphatically can be seen as more trustworthy. The problem lies that they may still not be any more trustworthy than those who cannot communicate that emphatically. Therefore, trust-building solutions for the trustworthiness of digital platforms would be interesting to research from the point of view of how much they really affect security. Here it is meant that which trust-building solutions are less used for fraud and which trust-building solutions there are more risks. In the sharing economy, especially users who are not familiar with the platform (first-time users) may form unjustified trusting beliefs (Möhlmann, 2021). A false sense of trust could have a harmful effect. However, this is only hypothesize and will not be tested in this thesis. Studies on unintended or unjustified trust in the sharing economy or other technology-mediated contexts are lacking, so there is no knowledge of their effects (Möhlmann, 2021).

Digital environments are common nowadays. Digital platforms, social media sites, and many more are used daily. It would be interesting to see which digital environments are seen as more trustworthy than others. Social media sites could be thought of as less trustworthy, but is it really so? People use, for example, Facebook groups for selling and renting. It could be useful to better understand which digital environments people trust more and why. In addition, there might be differences between trusting something and using something, and it would be interesting to examine when, for example, it may be more important that the digital environment used is easy to use than how trustworthy it is seen. In Article V, we drafted the first version of the matrix that can be used to develop trustworthiness of digital platforms (see section 4.2.3 Article V).

Research on trust in a digital society could be taken further from the topics of this thesis. An interesting research topic is, for instance, how neurodiversity or cognitive disabilities affect trust in digital platforms. Neurodiversity can be seen as richness because it allows people to think differently (see, e.g., Loiacono & Ren, 2018), but it is useful to understand that neurodiversity may affect, among other things, sensory sensitivity (see, e.g., Boyd et al., 2018); therefore, digital environments can be experienced differently. Thus, the accessibility and use of digital environments should be considered further. An example of this is Selkeästi Meille project (2023), which uses people with neurodiversity and cognitive disabilities to test websites to make them more accessible for all.

Pictures affect how trustworthy sharing economy users are seen. For example, facial expressions (Fagerstrøm et al., 2017), attractiveness, and photograph quality affect (Ert & Fleischer, 2020) how trustworthy the user is seen. However, these factors seem arbitrary, and for example attractiveness can be hypothesized not to be the best evidence of trustworthiness. Therefore, future research could examine how to better signal trustworthiness. Could, for example, avatars be used in platforms to emphasize humanness, but provide an answer for how to bypass this social bias? Another promising environment for studying the relationship between avatars and trust is remote meetings. Keeping cameras on during the meeting has been seen as a good way to build connections in remote work. However, video images can be distractions for some, especially those that are neurodiverse (Das et al., 2021). Future research could examine whether the use of avatars builds the connection and trust in remote meetings but be more mindful for those that are neurodiverse.

TABLE 13 Research topics with related research questions for future research.

Topic	Research questions
Definition of trust in different context and nationalities	Do different context affect how trust is defined? Does different nationalities see or define trust differently, and what are the differences?
Problems with trust-building solutions in platforms	Are the most seemingly trustworthy users really the most trustworthy? How do fraudsters behave on digital platforms? How does fraudster behavior in digital platforms lead to misplaced trust, and how can it be prevented?
"Trust pits" in digitalized world	What are the most common situations where person feels that their trust is misplaced?
Signaling trustworthiness in platform	Does the matrix for evaluating trust-building solutions lead to more trustworthy platforms if designers or managers are using it? Do platform companies see the matrix as useful and easy to use?
Neurodiversity or cognitive disabilities and trust	How neurodiversity or cognitive disabilities affect trust in digital platforms?
Using avatars to build trust	Can personal photos be changed to an avatar and still build trust - in digital platforms? - remote meetings?

The dissertation and its findings can be used as a base or inspiration in future studies that examine trust either in the adoption of digital innovations or in the sharing economy. It also offers practical tips and direction for organizations that aim to support especially the adoption of digital innovations by microenterprises (e.g. EU projects) and for the management or developers of sharing economy platforms.

YHTEENVETO (FINNISH SUMMARY)

Digitaalisuus on osa jokapäiväistä elämäämme. Luottamus järjestelmiä ja toisia ihmisiä kohtaan erilaisissa digitaalisuuteen liittyvissä konteksteissa vaikuttaa paljon toimintaamme. Esimerkiksi luottamus tukee digitaalisten innovaatioiden omaksumista ja on edellytys jakamistalouden alustojen käytölle. Suurin osa suomalaisista yrityksistä on mikroyrityksiä ja yksi tämän väitöskirjan tavoitteista on selvittää, kuinka mikroyritysten digitaalisten innovaatioiden omaksumista voidaan tukea ja millaiset seikat siihen vaikuttavat. Suomessa, ja Euroopassa yleensäkin, on yhä nähtävissä kuilu internet infrastruktuurissa ja digitaalisuuteen liittyvässä osaamisessa maaseutumaisten alueiden ja kaupunkialueiden välillä. Tuemmalla maaseudun mikroyritysten digitaalisten innovaatioiden omaksumista, on mahdollista pienentää tätä kuilua ja tukea valtakunnallista yritysten kehittymistä.

Ymmärrys mikroyritysten digitaalisten innovaatioiden omaksumisesta ja auttaa paremmin ymmärtämään myös pienten jakamistalouden yritysten tukemista. Jakamistalous mahdollistaa tavaroiden ja osaamisen jakamisen ja näin ollen tukee kestäväen kehityksen mukaista toimintaa, kun kaikkea ei tarvitse ostaa tai kun esimerkiksi heikommassa taloudellisessa asemassa olevat ihmiset voivat hankkia sen avulla lisätuloja (sosiaalinen kestävyys). Jakamistalous ei ole ilmiönä vain positiivinen vaan siihen liittyy haasteita muun muassa lainsäädäntöön ja huijauksiin liittyen, mutta tässä työssä keskitytään enemmän sen mahdollisiin positiivisiin vaikutuksiin. Jakamistalouden käyttö ja potentiaali jäävät saavuttamatta, jollei alustan tarvitsemaa käyttäjämäärää saavuteta. Yksi jakamistalouden alustan käytön edellytys on luottamus ja ilman luottamusta käyttö ei myöskään jatku. Tämän työn tavoitteena on paremmin ymmärtää, kuinka luottamus rakentuu jakamistalouden alustoilla ja kuinka sitä voidaan erilaisilla ratkaisulla ja suunnittelulla tukea.

Yksi väitöskirjan kontribuutiosta on aiempiin teorioihin pohjautuva työpaajakonsepti maaseudun mikroyritysten digitaalisten innovaatioiden tueksi. Monet aiemmat tutkimukset ovat kehitelleet teorioita ja testanneet niitä lähinnä kyselytutkimuksin. Tämä työ tarjoaa käytännön esimerkin ja esittelee siitä saadut kokemukset kolmen vuoden ajalta. Lisäksi työssä tarkastellaan COVID-19 pandemian vaikutusta yritysten digitaalisten innovaatioiden omaksumiseen.

Viime vuosina luottamusta jakamistaloudessa on jonkin verran tarkasteltu. Holistinen kuva, joka huomioi sekä teknologiset että ihmisten käyttäytymiseen liittyvät tekijät, luottamuksen rakentumisesta jakamistalouden alustoilla kuitenkin puuttuu. Väitöskirja pyrkii luomaan kattavan kuvan ilmiöstä. Koska luottamus vaikuttaa myös aikomukseen käyttää jakamistalouden alustaa, työssä tarkastellaan myös ensimmäistä kertaa jakamistalouden alustaa käyttävien kokemuksia ääneenajattelututkimuksella (think-aloud menetelmä). Suurin osa jakamistalouden luottamusta tutkivista tutkimuksista on kyselytutkimuksia, joten erilainen tutkimusote rikastaa tutkimuskenttää aiheesta. Lisäksi työssä kehitetään matriisi, jolla alustojen kehittäjät voivat arvioida luottamusta tukevien rat-

kaisujen teknisiä vaatimuksia sekä vaadittujen investointien määrää. Näin erityisesti pienet ja voittoa tavoittelemattomat alustat voivat kehittää luottamusta ilman, että valitut toimet ovat liikaa alustaorganisaatiolle. Matriisia testataan yhden alustayrityksen kanssa ja yrityksen alustavat kokemukset ovat lupaavia. Väitöskirjassa huomataan myös haaste luottamuksen määrittelyssä jakamistaloutta koskevissa tutkimuksissa. Tarkastelun tuloksena ehdotetaan, että jokaisen luottamusta, luotettavuutta tai digitaalista luottamusta koskevan tutkimuksen tulisi määritellä käyttämänsä termit, jotta tutkimuksia voitaisiin paremmin hyödyntää ja ymmärtää.

Väitöskirja ja sen esittelemät tulokset ovat hyödynnettävissä tulevissa tutkimuksissa, joissa tarkastellaan luottamusta joko digitaalisten innovaatioiden omaksumisessa tai jakamistaloudessa. Se tarjoaa myös käytännön vinkkejä ja suuntaa organisaatioille, jotka pyrkivät tukemaan erityisesti mikroyritysten digitaalisten innovaatioiden omaksumista (esimerkiksi EU-hankkeet) sekä jakamistalouden alustojen johdolle tai kehittäjille.

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- Supplementary Material: A tutorial on constructing the Flanker task.



ORIGINAL PAPERS

I

ADOPTION OF DIGITAL INNOVATIONS IN RURAL ENTERPRISES DURING COVID-19

by

Räisänen, J., & Tuovinen, T., 2023

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Adoption of digital innovations in rural enterprises during COVID-19

Abstract

The COVID-19 pandemic has rapidly affected the operating conditions of companies. Traditional customers and operational models are changing radically in the short term. Digitalization and digital methods provide an opportunity to reorganize working methods and create a new kind of business to replace old methods and business models. Compared to urban businesses, rural businesses have less experience with digital tools and are less likely to adopt digital innovations; this makes rural businesses especially vulnerable. The purpose of this study was to provide insight into how microenterprises and small and medium-sized enterprises in rural areas have addressed the COVID-19 pandemic, the digital solutions they have adopted, and the kinds of challenges they have faced. This study particularly emphasized microenterprises and was based on survey data collected in Finland in the spring of 2020.

1. Introduction

Compared to urban enterprises, rural enterprises are in a disadvantaged position with respect to digitalization. In some areas, rural enterprises have inferior data infrastructures (Salemink, Strijker and Bosworth, 2017) and may have fewer options for broadband services (Ashmore, Farrington and Skerratt, 2017). Rural businesses also have less experience with digital tools and are less likely to adopt new digital technologies than urban businesses (Krumina, Krumins and Rozentale, 2015; Townsend et al., 2016). From this weaker starting point, rural enterprises may experience more difficulties due to the COVID-19 pandemic because this crisis has pushed companies to digitalize their operations at an accelerated pace. This chapter will examine how Finnish enterprises in rural areas have coped with the changing situation and how the COVID-19 pandemic has affected the adoption of digital innovations in the spring of 2020.

The COVID-19 pandemic has challenged the livelihoods of many entrepreneurs, for example, by reducing the number of customers and the amount of cash flow. The pandemic has also affected the poverty rate, employment, and the nature of work (Mofijur et al., 2021). Rural economies, which tend to involve high self-employment and more small and microenterprises, have had particular difficulty adjusting to these sudden changes. In addition, those who have part-time, irregular, or seasonal work are more likely to have been ill-prepared for this situation (Phillipson et al., 2020). The pandemic has created uncertainty because we do not yet know when the situation will be over, even though several vaccines have been created and vaccination has started in December 2020. Among other things, COVID-19 has limited the number of physical contacts, and digitalization could potentially offer a solution to this challenge.

Historically, the COVID-19 pandemic is not a once-in-a-lifetime crisis. Before COVID-19, there were other large-scale crises, such as the outbreak of foot-and-mouth disease in the United Kingdom in 2001 and the financial crisis and recession in 2007–2008 (Phillipson et al., 2020). It is likely that similar crises will occur in the future. Therefore, it is important to understand how to deal with these crises, how to prepare for them, and how to support companies through them. Phillipson et al. (2020) suggested that COVID-19 may stimulate innovative responses and the adoption of new solutions by businesses and rural areas, and attempts should be made to learn from this situation.

The present study explored how companies in rural context have adjusted their operations to cope with the changing situation of the COVID-19 outbreak, with a specific focus on the means of digitalization that companies have adopted or have planned to adopt. In addition, this study explored participants' trust in technology as well as their interpersonal trust because both of these factors affect technology adoption (Lippert and Davis, 2006). To this end, survey data were collected from 149 Finnish companies in the spring of 2020. Most of these companies were located in rural or sparsely populated areas (93%), and most were microenterprises.

Microenterprises are important to the national economy of Europe. For example, 99.5% of companies in Germany are microenterprises, and these microenterprises are important to Germany's economic stability (Roitzsch et al., 2012). Similarly, 93% of companies in Finland are microenterprises, and only 0.2% are large enterprises (Yrittäjät, 2018). Therefore, it is important to study how

microenterprises adapt to changing situations and determine how these enterprises can be supported in the future.

This chapter begins by providing a background on rural microenterprises and their adaptation to change. After the background, we describe how data was collected for the present study. Then, we examine the results regarding how the participating companies reacted to COVID-19. Next, we discuss these results, areas for future research, and the practical implications and limitations of the present study. Finally, the chapter is summarized and the conclusions of the study are stated in the last chapter.

2. Background

2.1 Rural enterprises

The definition of rural business or rural entrepreneurship is unclear and variable (McElwee and Smith, 2014). In this chapter, rural businesses are defined by their geographical locations, in that rural businesses are located in rural areas. However, previous research has recognized aspects of rural business other than location. Rural businesses are usually more reactive than proactive and tend to employ local individuals (McElwee and Smith, 2014).

Finland (Official Statistics of Finland, OSF, 2020, English translation by Räsänen and Tuovinen, 2020) divides rural and urban regions into seven categories (Figure 1), including three types of urban areas:

1. Inner urban area: A compact and densely built area with continuous development.
2. Outer urban area: A dense urban area extending from the boundary of the inner urban area to the outer edge of the area of continuous development.
3. Peri-urban area: A part of the intermediate zone between urban and rural, which is directly linked to an urban area.

A rural area is any area that has not been identified as urban. Finland recognizes four types of rural areas:

1. Local centers in rural areas: Population centers located outside urban areas.

2. Rural areas close to urban areas: Areas with a rural character that are functionally connected and close to urban areas.
3. Rural heartland areas: Rural areas with intensive land use, a relatively dense population, and a diverse economic structure at the local level.
4. Sparsely populated rural areas: Sparsely populated areas with dispersed small settlements that are located at a distance from each other. Most of the land areas are forested.

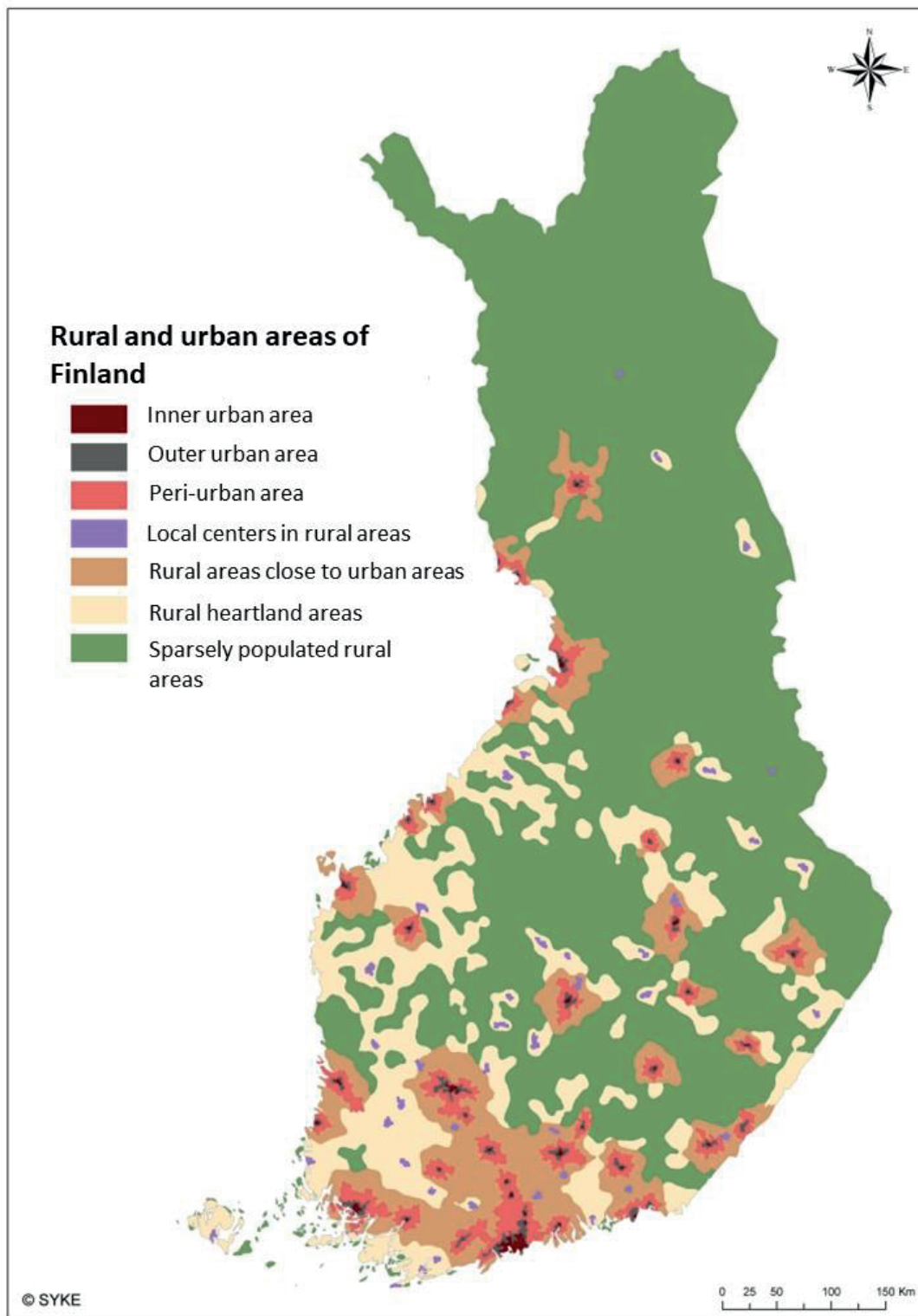


Figure 1. Rural and urban areas of Finland (Helminen et al., 2013, p. 2).

2.2 Technology adoption and trust

Trust can affect the acceptance of change and the adoption and diffusion of innovation. Before a person decides to trust someone or something, they evaluate the risks and the evidence of trustworthiness (Gambetta, 2000; Lewis and Weigert, 1985; Luhmann, 2000). Räsänen and Tuovinen (2020) found that people's willingness to share ideas is affected by their trust issues with change agents and with other individuals. This effect was observed in workshops designed to support the adoption and diffusion of digital innovation in rural microenterprises. The development of trust between individuals and change agents and between individuals themselves could create better opportunities for business development (Räsänen and Tuovinen, 2020).

Lippert and Davis (2006, p. 434) proposed that “technology trust and interpersonal trust, when coupled with planned change initiatives, lead to greater technology adoption and internalization.” Based on this concept, Lippert and David (2006) created a conceptual model of how trust in technology and interpersonal trust affect technology adoption and internalization (Figure 2). This model consists of external factors, such as the national financial situation, that foster or hinder organizational conditions that affect willingness to change and willingness to adopt new technology. Both environmental and organizational factors affect the trust of the individual, the effects of change initiatives, and the internalization of new technology.

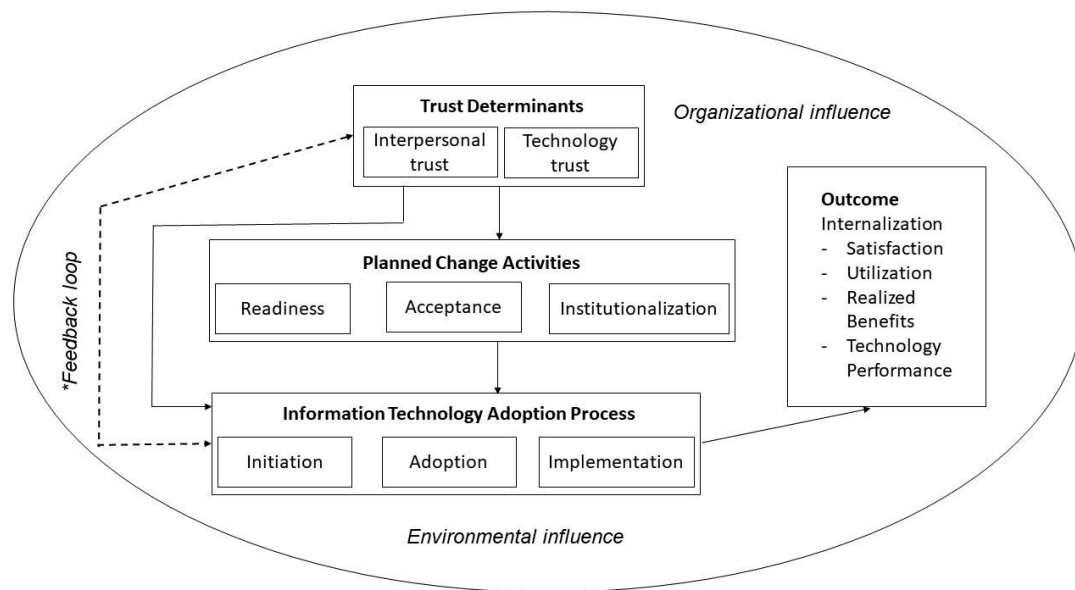


Figure 2. Conceptual model by Lippert and Davis (2006, p. 436).

In addition, Lippert and Davis (2006) proposed that two perspectives influence the adoption of information technology (IT): 1) interpersonal trust and trust in technology and 2) willingness to accept and use IT. Furthermore, the change process has three parts: 1) readiness, in which actions (e.g., new hardware) support the change; 2) acceptance, in which new methods and technologies are accepted and tested; and 3) institutionalization, in which the change becomes routine (i.e., the new normal). Trust determinants, interpersonal trust, and trust in technology affect planned change activities and the IT adoption process. Planned change activities can lead to various outcomes, including satisfaction, internalization, utilization, the recognition of benefits, and assessments of the technology's performance (Lippert and Davis, 2006).

The key to effective technology use is trust in technology (Kivijärvi, Leppänen and Hallikainen, 2013, January). Casey and Wilson-Evered (2012) conducted a study of trust in the context of an online family dispute resolution system and noted that trust is essential to the uptake of technology. In this prior study, trust indirectly affected behavioral intentions to adopt the new system. More specifically, the effects of trust in technology mediated effort expectancy. In addition, Schwartz et al. (2015) and Asadi, Nilashi and Yadegaridehkordi (2017). Asadi, Nilashi and Yadegaridehkordi

(2017) have also highlighted the importance of trust in the uptake of technology. Schwartz et al. (2015) studied trust in technology in the context of a home energy management system. Trust was especially important in this context because the system was in a new class of devices and its energy consumption was not yet well understood. Furthermore, Asadi, Nilashi and Yadegaridehkordi (2017) found that the behavioral intentions of users to adopt cloud computing were affected by the perceived usefulness, perceived ease of use, and cost of the cloud as well as the users' attitudes toward and trust in the cloud.

2.3 Rural microenterprises and digitalization

Currently, the digital divide is an especially pertinent issue in rural areas (Park, 2017; Räisänen and Tuovinen, 2020; Veselovsky et al., 2018; Salemink, Strijker and Bosworth, 2017). Rural areas have lower rates of digital adoption than urban areas; even in developed countries, such as Finland, certain areas are digitally excluded (Räisänen and Tuovinen, 2020). The digital divide negatively affects the social and economic progress of the entire nation (Veselovsky et al., 2018). For this reason, the issues associated with the digitalization of rural companies should be recognized and investigated.

Digitalization and IT can support the operations of rural businesses and help them find new ways of doing business. The use of IT increases information access and could thus allow microenterprises to increase the extent of their business knowledge (Kamal et al., 2010). However, rural microenterprises are often in a disadvantaged position compared to urban microenterprises. Businesses in rural areas often have inferior data infrastructures, and their managers tend to have fewer skills and less education than the managers of larger enterprises (Salemink, Strijker and Bosworth, 2017). In addition, Townsend et al. (2016) found that rural microenterprises tend to have difficulty realizing the value of technology (specifically, social media tools) because they tend to lack the experience, skills, and knowledge needed to use technology effectively.

Microenterprises are usually more flexible than larger organizations. Roitzsch et al. (2012) stated that microenterprises and small and medium-sized enterprises (SMEs) can use this flexibility to cope with change. Entrepreneurs adapt to sudden change through improvisation (Duxbury, 2014). Start-

ups, which do not have long histories or well-established ways of doing things, may improvise more easily than older companies. Roitzsch et al. (2012) suggested that the flexibility of microenterprises and SMEs can be enhanced by self-set goals. They also introduced the idea that management in small and microenterprises often consists of workers who are skilled but lack management training. This may be why these enterprises do not always have the knowledge required to increase flexibility. However, external obstacles to flexibility, such as a shortage of skilled workers or a worldwide pandemic, cannot be changed by the company.

According to Gosenpud and Vanevenhoven (2011), microenterprises in developing countries must do four things to better understand their changing environments: 1) perform an external environment analysis, 2) perform an internal environmental analysis, 3) plan, and 4) network. Although this approach was tailored for developing countries, it could also be useful in developed countries. Environments change quickly in developed countries, for example, due to digitalization and the COVID-19 pandemic. Enterprises in developed countries may be slower to change than those in developing countries, but changes still occur in these companies and should therefore be considered.

3. Research design

The research data used in the present study were collected in Finland from March 25 to June 7, 2020. To collect this data, a survey was shared with companies through e-mail and social media (Facebook and LinkedIn), mostly by local entrepreneur associations. This survey consisted of 25 questions, including 16 multiple choice questions and nine open-ended questions. Due to the difficult situation created by the worldwide pandemic, a survey with a limited number of questions was considered a more practical option than interviews. In Finland, a municipality may be termed a *kaupunki* (i.e., city or town) even if it is small; for example, the smallest *kaupunki* has 1,246 inhabitants (Association of Finnish Municipalities, 2020). As a result, some residents may feel that they are urban even if they live in sparsely populated areas of Finland. For this reason, the survey did not focus solely on rural companies.

One hundred and forty-nine participants responded to the survey. Of the participating companies, 91% ($n = 136$) had 1–9 employees, 7% had 10–50 employees, 1% had 51–250 employees,

and 1% had over 250 employees. Furthermore, 94% ($n = 140$) of the companies had a yearly turnover of 0–2 million euros, 5% had a turnover of 2–10 million euros, and 1% had a turnover of 10–50 million euros. Only 11 participants were from cities, which cannot be considered rural or sparsely populated areas. Overall, the research data represented rural microenterprises relatively well, even though there were few participants from urban areas.

4. Results

The spread of COVID-19 has occurred at different rates in different countries. During the data collection period of March 25 to June 7, 2020, the number of COVID-19 cases in Finland multiplied from 1,190 to 7,082. As of September 25, 2020, there were 9,484 detected cases of COVID-19 in Finland. The Finnish Institute for Health and Welfare has reported 335 disease-related deaths. The status of COVID-19 in Finland during the study period is illustrated in Figure 3. The following sections describe the results of this study.

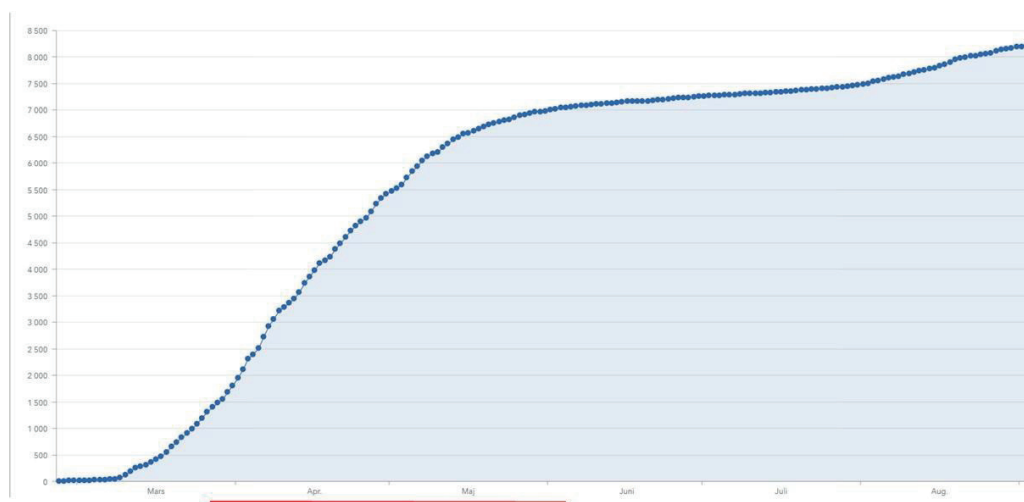


Figure 3. Cumulative increase in the number of COVID-19 cases in Finland (THL, 2020). The red line shows the survey data collection period.

4.1 Situation and changes of the participating companies

Many enterprises are in difficult situation due to the COVID-19 pandemic. In the present study, entrepreneurs were asked to estimate whether their situation were better than, the same as, or worse than they were one year prior. Most of the entrepreneurs estimated that their current situation had worsened. This is understandable, as COVID-19 has resulted in new regulations and recommendations that may be disadvantageous to entrepreneurs. However, 6% of the entrepreneurs reported that their situation had improved.

The industries of the participating companies are described in Figure 4. These industries were divided into seven categories: a) agriculture, forestry, and fisheries; b) manufacturing; c) construction; d) wholesale, retail trade, and repair of motor vehicles and motorcycles; e) services; f) other industries; and g) not reported. The first six of these categories follow the categorization system of the OSF (2010), and the seventh category pertains to companies that did not report their industries.

Services include the following industries: transport and storage; accommodation and food service activities; information and communication; financial and insurance activities; real estate activities; professional, scientific, and technical activities; administrative and support service activities; arts, entertainment, and recreation; and other service activities. Other industries include mining and quarrying; electricity; gas and heat supply; refrigeration; water supply; sewerage; waste management and remediation activities; public administration and defense; compulsory social security; education, health, and social services; activities of households as employers; undifferentiated goods-producing and service-producing activities of households for their own use; and activities of international organizations and bodies. Although there are some differences between industries, companies in the service industry are not the only companies in trouble due to the pandemic. The wholesale industry, the construction industry, and other industries also appear to be in difficult situation. This may be because businesses in these industries are mainly rural, as rural businesses tend to be small compared to urban companies.

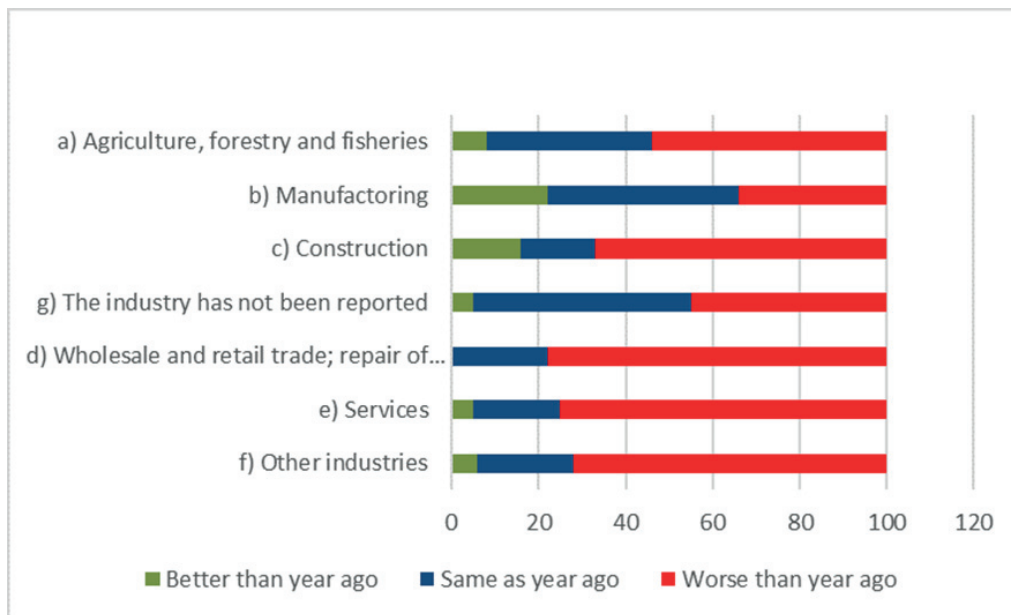


Figure 4. Industries of the participating companies and estimations of their current situation in percentages.

Many participants reported that their companies are currently in serious situation.

“Week more work on the calendar. Then, it ends. No new orders have arrived. Customers closed the money taps one to two weeks ago and failed to pay their bills.”

Some participants noted a need to change and quickly develop new products and services to address the situation.

“The work is practically over, and the salary cannot be paid, so new services must be developed quickly.”

Different companies had different reactions and implemented different changes in response to the pandemic. The participants were asked to describe the changes their companies had made due to the pandemic, and their responses were divided into seven categories (Table 1). One hundred and thirty-nine participants responded to this question. Many of the participating companies had adopted new

digital tools or channels (30%, $n = 41$), but 21% had changed nothing ($n = 29$). Alarming, many companies had to shut down or suspend business (9%, $n = 13$) due to COVID-19.

“On March 16, 2020, due to the ban on gatherings, I had to suspend the company, and I will close it down as soon as I can contingent on the money transfer. Now, it is not possible for me to close down because there is no money to pay for the closure.”

“I returned to school and drove down my business.”

Some participants were clearly concerned about the future, and some were ready to adjust their companies' activities and services in order to survive. However, other participants believed that there was nothing they could do or change about their companies.

“I cannot do anything.”

Changes made by companies	Percent of companies that implemented the change
Nothing	21 %
Growth/hiring new labour	1 %
Planning the future	2 %
Other development or modification	17 %
Retrenchment	17 %
New digital tools or channels	30 %
Increasing precautionary measures (e.g., improving hygiene)	6 %
Ending or suspending the business	9 %

Table 1. Changes made by the participating companies.

The COVID-19 pandemic has accelerated the digitalization of companies in Finland. Nearly half of the participating companies (47%, $n = 66$) reported that they would not have made these changes if not for COVID-19. Otherwise, 38% ($n = 54$) stated that they would have implemented these changes even in

the absence of COVID-19, and 15% ($n = 21$) stated that they might have implemented these changes in the absence of COVID-19.

Change can be difficult, especially when it is due to something beyond one's control, such as a worldwide pandemic. Nevertheless, most of the participants (48%, $n = 69$) did not find the changes they had made to their operations or the implementation of new digital tools to be as difficult as they had expected. Many companies have begun to use new digital tools and applications to facilitate online meetings since the start of the COVID-19 pandemic (Table 2).

Digital tools that have been adopted in the past six months	Percent of the companies that adopted the digital tool
Application for online meeting	72 %
Video sharing service	16 %
Social media channel	27 %
Survey tools	14 %
Paid online advertising	17 %
Online store	17 %
Customer relationship management tool	10 %
Something else	11 %

Table 2. What digital tools have you adopted in the past six months?

4.2 Information and communication technology skills

An analysis was carried out to assess the association between the participating companies' information and communication technology (ICT) skills and the entrepreneurs' estimations of their companies' situation. The results (Figure 5) suggest that companies with lower ICT skills estimated their situation to be worse compared to those with better ICT skills. Many of the changes made by companies during

the spring of 2020 were associated with digitalization. For example, some companies developed web stores and began to use online meeting applications as well as digital marketing. In response to the COVID-19 pandemic, the public was asked to maintain social distancing; naturally, digitalization offered a solution that would allow business to continue in these new circumstances. Entrepreneurs who felt that their situation had improved since one year prior were more likely to report that they would have made the reported changes even in the absence of COVID-19 (Figure 6).

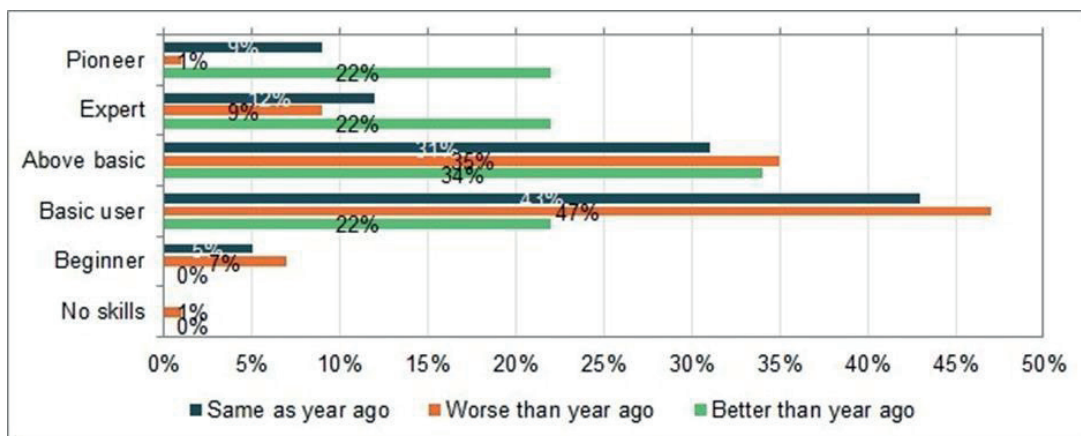


Figure 5. Association of companies' information and communication technology skills with entrepreneurs' estimations of their companies' current situation.

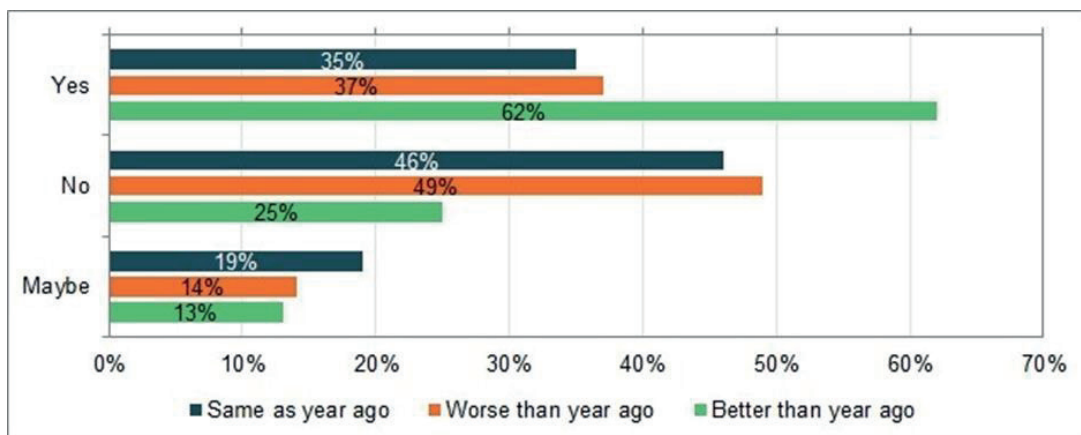


Figure 6. Association of the entrepreneurs' estimations of their companies' current situation with their belief that they would have implemented the same changes in the absence of COVID-19.

Furthermore, we investigated the association between entrepreneurs' estimations of their companies' current situation and the degree to which they found the adoption of new digital tools to be as difficult as they had expected. The results (Figure 7) suggest that companies that estimated that their situation had improved or remained the same since one year prior tended to report that making changes in their companies was not as difficult as they had expected.

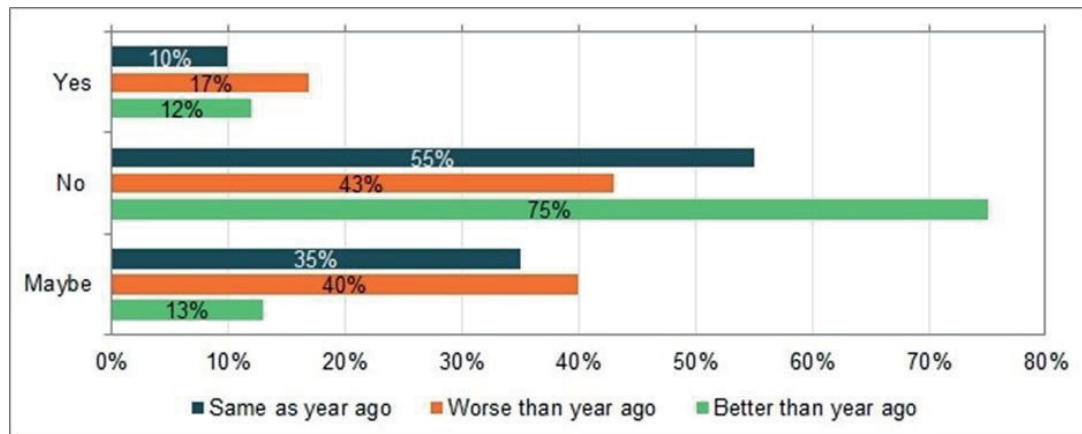


Figure 7. Association of the entrepreneurs' estimations of their companies' current situation with the degree to which they found it difficult to make changes in their companies.

4.3 Trust and technology adoption

In Lippert and Davis's (2006) conceptual model, environmental and organizational factors affect the trust of individuals, the effects of change initiatives, and the internalization of new technology. Lippert and Davis (2006) proposed that trust in technology, willingness to accept and use technology, and interpersonal trust lead to more effective technology adoption. The present study aimed to determine whether trusting individuals cope better with change, particularly in the context of adopting new digital solutions.

An analysis was carried out to assess the association between the entrepreneurs' estimations of their companies' current situation and the degree to which they trusted the digital solutions used by their companies. The results (Figure 8) suggest that those who trusted the digital solutions used by their companies performed better than those who did not trust the digital solutions used by their companies. In addition, those who estimated higher levels of customer trust in their companies' ability to thrive in

a digital environment (Figure 9), trust in their companies' futures (Figure 11), and trust in the future (personal; Figure 13) performed better than those who were less trusting. However, trust in partners (Figure 10) and trust in other people were not clearly associated with performance (Figure 12).

The results regarding trust in one's company and in the future support the hypothesis that entrepreneurs whose company performance had improved or remained the same since one year prior were coping with change and digitalization better than those whose company performance had worsened. However, personal trust in other people did not appear to affect this.

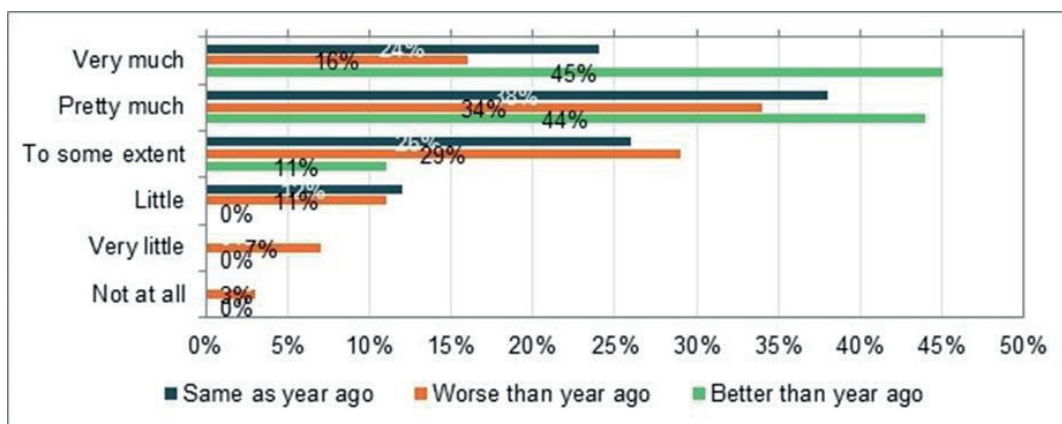


Figure 8. Association of entrepreneurs' estimations of their companies' current situation with their trust in the digital solutions their companies used.

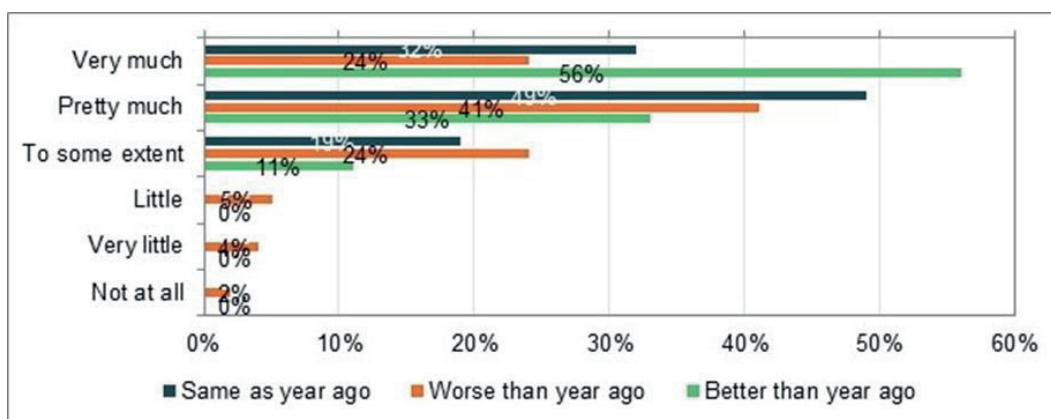


Figure 9. Association of entrepreneurs' estimations of their companies' current situation with the degree to which they believed their customers trusted them and their companies to operate effectively in a digital environment.

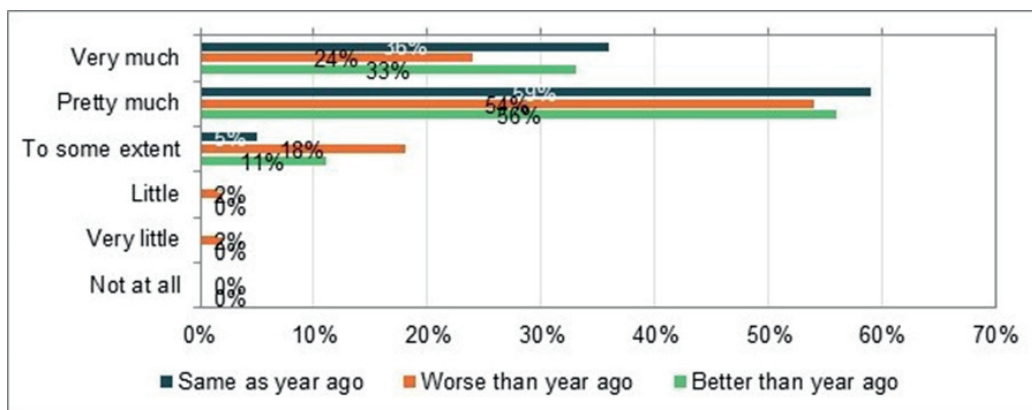


Figure 10. Association of entrepreneurs' estimations of their companies' current situation with their trust in their companies' partners.

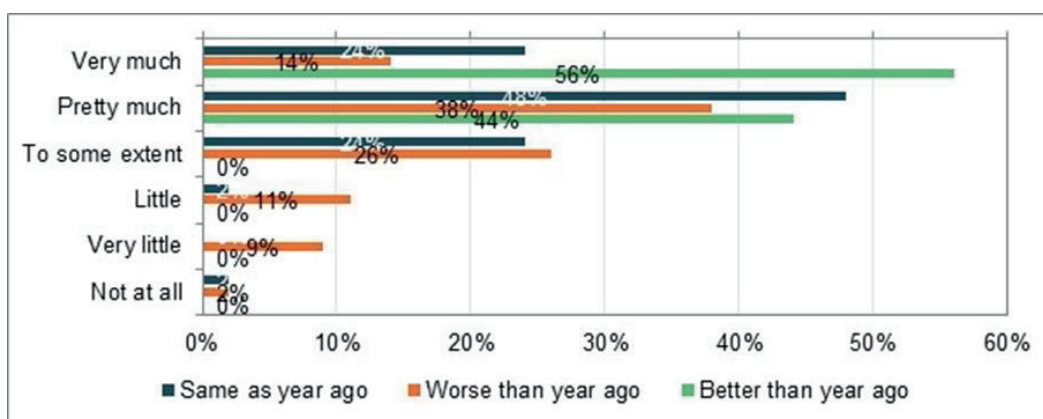


Figure 11. Association of entrepreneurs' estimations of their companies' current situation with their trust in the futures of their companies.

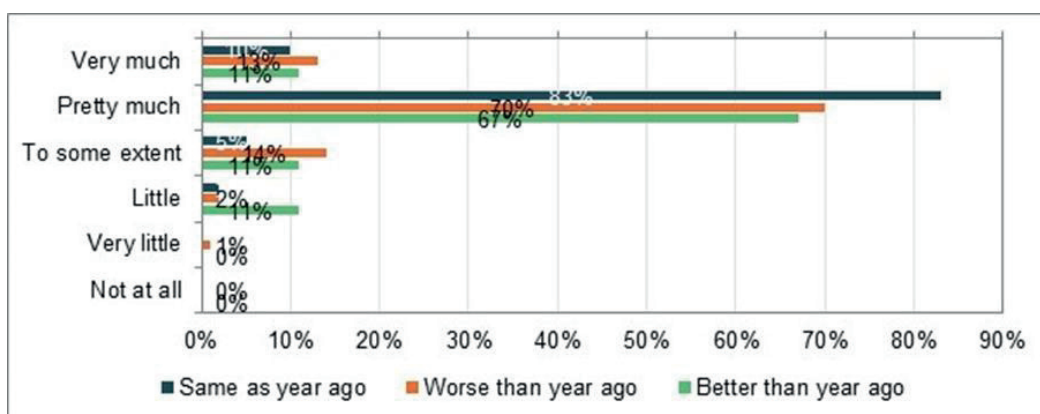


Figure 12. Association of entrepreneurs' estimations of their companies' current situation with their trust in other people.

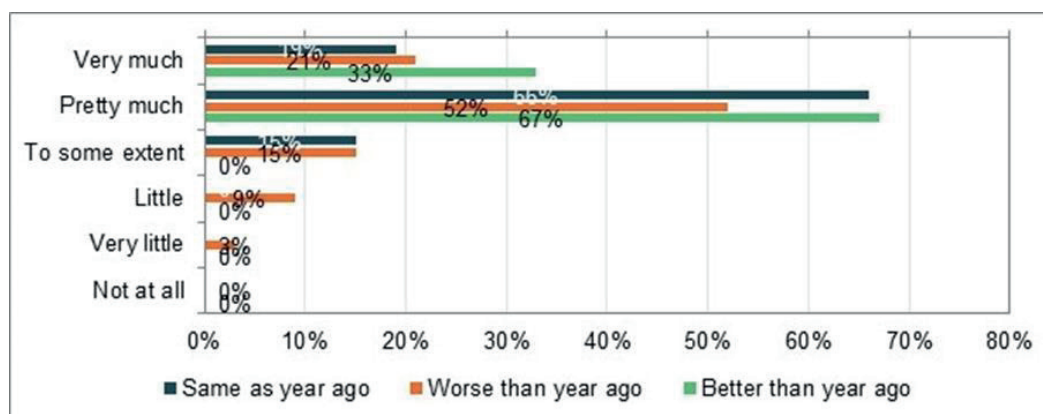


Figure 13. Association of entrepreneurs' estimations of their companies' current situation with their trust in the future.

5. Discussion and conclusions

The major issues caused by COVID-19 have forced many businesses to close entirely but have also accelerated digitalization. Many of the companies that participated in the present study reported that they had adopted new digital tools or channels. Nearly half (47%) reported that they would not have made these changes if not for the pandemic. However, it remains unknown whether these changes will become habitual and continue after the pandemic ends (Phillipson et al., 2020). As of December 2020, there is no clear end to the pandemic in sight. It is possible that the changes made by companies in response to the pandemic will remain in place for so long that they will become everyday business operations even after the crisis has ended. This could help companies in the future, as it is likely that similar crises will occur. In addition, other factors such as global warming are also likely to affect the business and operations of enterprises in the future.

Most of the participants (66%) in this study encountered difficulties in the spring of 2020. The situation created by the pandemic is prolonged, and strict recommendations are in effect in Finland as of December 2020. In addition to companies in the service industry, many companies in other industries reported that they were in difficult situation due to the pandemic. However, this result might have been amplified by the fact that most of the respondents were rural businesses. Rural businesses are typically small, are typically more reactive than proactive (McElwee and Smith, 2014), and may have inferior

managerial skills (Salemink, Strijker and Bosworth, 2017) compared to urban businesses. In the spring of 2020, 21% of the respondents had made no changes to their business. If this study were repeated, it is possible that these respondents will have made some changes to their operations or business since the data collection period of the present study.

The need to change business practices arose somewhat suddenly, but the participating companies seemed to be capable of adopting new digital tools at a fast pace (30%). Björklund et al. (2020, p. 3) noted that “many entrepreneurs described the crisis lowering the threshold for experimentation through creating a sense of urgency.” Therefore, it appears that companies have implemented digitalization and change surprisingly well. Rural microenterprises may benefit from their characteristics of being more reactive than proactive (McElwee and Smith, 2014) and more flexible than bigger organizations (Roitzsch et al., 2012).

Most of the respondents in the present study estimated their ICT skills as basic. The entrepreneurs who reported greater ICT skills tended to estimate that the situation of their companies were better compared to those who reported lower ICT skills. The COVID-19 pandemic created a situation in which face-to-face interactions with customers may no longer be an option. This has increased the frequency of online shopping in Finland (Suuri Verkkokauppatutkimus, 2020). The results of a study by Björklund et al. (2020) suggested that the COVID-19 pandemic has pushed enterprises to utilize collaboration and collective action more frequently. For example, sharing economy platforms could serve as cost-effective means of conducting online sales for microenterprises. A sharing economy application could also support more sustainable business (Räisänen, Ojala and Tuovinen, 2021). If rural enterprises wish to compete in online markets, they will require at least basic ICT skills. Earlier studies have also indicated that rural businesses have less experience with digital tools, are less likely to adopt new digital technologies, and often have difficulty realizing the value of technology compared to urban businesses (Krumina, Krumins and Rozentale, 2015; Townsend et al., 2016). Certain interventions and training programs could help to improve the ICT skills and competitive advantage of rural businesses (for example, see Räisänen and Tuovinen, 2020). However, rural areas also tend to have inferior data infrastructures (Salemink, Strijker and Bosworth, 2017); therefore, infrastructure development should also be supported for rural microenterprises.

Interpersonal trust and trust in technology can positively affect technology adoption (Lippert & Davis, 2006). Therefore, the present study examined the respondents' trust in technology, other people, and the future. The respondents generally trusted the digital tools used by their companies. This is a beneficial characteristic, given that trust in technology positively affects technology adoption. In addition, the present study made several preliminary observations that may be further explored by future studies. The entrepreneurs who reported high levels of trust in digital solutions, their customers' trust in their ability to operate effectively in a digital environment, and the futures of their companies performed better and appeared to cope with change better than those who reported lower levels of trust. These individuals seemed to trust their companies as well as their personal futures. However, they were not necessarily trusting of others, as they did not report very high levels of trust in their partners and other people.

The present study investigated the challenges brought on by the COVID-19 pandemic, examined the solutions implemented by rural microenterprises in response to these challenges, and preliminarily estimated the importance of trust in this context. Various measures have been found to have positive effects on attitudes toward digital innovation (Räisänen and Tuovinen, 2020) and the learning of IT knowledge and skills (Kamal et al., 2010). The background information collected in the present study can be used to plan such support measures for rural microenterprises.

The challenges created by COVID-19 have accelerated the digitalization of companies, and it is possible that future crises will have similar effects. Rural microenterprises are at a disadvantage in such situation due to the typically lower skill levels of their entrepreneurs and management (Salemink, Strijker and Bosworth, 2017). More information is needed to determine how these enterprises can be supported in crises. This information could be collected, for example, through action research during the COVID-19 crisis. In addition, after the crisis has ended, it will be essential to determine whether the changes made during the crisis became permanent and how enterprises recovered from the crisis. In particular, studying successful companies could reveal the recipe for success in a crisis.

As in all studies, there were several limitations in the present study. First, the research survey was carried out over a short period because we aimed to collect authentic data during the COVID-19 pandemic, which appeared as if it might soon be over in the spring of 2020. Longer and more careful

planning could have improved the quality and reliability of the data. Second, more information is needed with regard to trust in the context of the present study, as this study alone did not allow for far-reaching conclusions to be drawn on this subject. Finally, COVID-19 has affected different places differently, and the results of the present study only describe the situation in Finland. For example, different laws, regulations, recommendations, and cultural factors could influence how people react and cope in this kind of crisis.

In conclusion, this chapter discussed how Finnish microenterprises mostly located in rural or sparsely populated areas have coped with the COVID-19 pandemic. Specifically, the present study explored how microenterprises have changed their operations and business as well as the means of digitalization adopted by these companies. Many companies have experienced difficult situations due to the pandemic and have thus adopted digital tools in order to survive. However, it is alarming that many others have done nothing to modify their business in response to this situation. It appears that companies that were more eager to digitalize are now performing better than those that were less eager to digitalize. Furthermore, entrepreneurs' levels of trust in their companies and in the future could predict which companies are more likely to survive this kind of crisis. However, this topic requires further study. In addition, given that it takes time for changes to become habitual, it remains to be seen whether the changes made by companies in response to the crisis will become permanent. Studies should be carried out after the crisis has concluded to assess whether these changes became permanent.

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II

DIGITAL INNOVATIONS IN RURAL MICRO-ENTERPRISES

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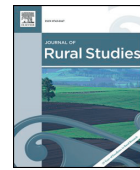
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Digital innovations in rural micro-enterprises

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ABSTRACT

Digitalization gives micro-enterprises and rural areas new possibilities and it can support their competitiveness. In this paper, we have presented one way of supporting the diffusion and adoption of digital innovations in rural micro-enterprises. First, we examined the challenges and digital competence of the micro-enterprises in the rural areas of Central Finland to better understand what they needed. The second step was to develop a workshop concept. Theories of innovation diffusion and adoption were used as a base for these workshops. The last step was to evaluate the developed concept, its effects and challenges. We found that the workshop concept worked well for spreading information, for encouraging a positive attitude towards digital innovations, and for planning the use of innovations. Important factors in order for this concept to work were trust, communication, and changing the roles of agents and opinion leaders.

1. Introduction

The digital divide of rural and urban areas is still a current issue (Park, 2017; Veselovsky et al., 2018; Salemink et al., 2017). It slows down social and economic progress of the whole nation (Veselovsky et al., 2018). Digitally excluded areas are also found in digitally advanced countries such as Finland. Rural areas have been studied for example in Russia, in Australia (Park, 2017; Veselovsky et al., 2018), and in the United Kingdom (Warren et al., 2002; Malecki, 2003; Philip et al., 2017; Ashmore et al., 2017). Research shows that rural and urban areas in the same country have differences in the quality of the data infrastructure, and rural areas have also lower average levels of education and skills (Salemink et al., 2017). Rural communities are remote, and usually less connected. Better digital connections may be an answer to the remoteness of the rural areas. Internet services can provide services and information that might not be otherwise possible to get in rural areas (Townsend et al., 2013). Well working digital infrastructure can be important for example to the production of community digital heritage, to the ability to self-publish material on the internet, and as a building block in the relationship between local and global communities (Beel et al., 2017).

Still, there are some issues that are not easy to solve. For example, faster internet technologies are becoming available, but they will be more expensive to rural households and businesses than to those that live and work in urban areas. People in rural areas may also have fewer options when selecting their broadband provider, because of their place of residence (Ashmore et al., 2017). For example, Salemink (Salemink

et al., 2017) and Townsend et al. (2013) studied rural development in the digital age, and found that faster internet technologies may actually increase the urban-rural digital divide, because faster internet technologies are harder to get and more expensive in rural areas. In addition, global competition is increasing and the slower internet connections of rural areas may result in a loss of competitiveness, not only in rural areas, but also at the national level. A transition to digital economy could be at least a part of the answer to improving the economy and, for example, improving availability of services of rural areas. Especially better services in the field of education and health are needed (Veselovsky et al., 2018).

Faster internet technologies can narrow the digital divide, but better internet connections by themselves are not enough. Rural communities also need digital competence (Malecki, 2003). Alam, Erdiaw-Kwasie, Shahiduzzaman and Ryan (Alam et al., 2018) define it as “the capacity and capability of different stakeholders to embrace the emerging technologies”. Without proper knowledge of digital innovations and skills to use them, internet connections do not help rural communities and enterprises to flourish (Salemink et al., 2017). Developing digital skills and talents in Europe is a necessity.

A report on the digital infrastructure in China and the European Union (Ben et al., 2017) estimates that a “10% increase in broadband penetration may raise gross domestic product (GDP) by 1–1.5%, and by 2020, 90% of jobs will require some digital skills”.

The theories selected for this research are among those widely used to explain diffusion and adoption of innovations. The Technology Acceptance Model (TAM) was created by Davis (Davis, 1985; Davis

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et al., 1989) and explains adoption of innovations. With TAM it is possible to better understand why people are opposed to computer use, predict how users respond to systems or innovations, and improve the acceptance of information systems by changing the processes of how the information systems are introduced. The United Theory of Acceptance and Use of Technology (UTAUT) is considered good for evaluating the success of new innovations and their adoption, and the factors influencing it (Williams et al., 2011). Rogers's innovation diffusion theory provides a holistic framework for understanding the innovation diffusion process (Chang, 2010; Brancheau and Wetherbe, 1990). Innovations spread as a result of information and communication. Rogers's innovation diffusion theory focus on communication and communication channels (Mahajan et al., 1991).

Digital innovation can be defined as innovation that combines digital and physical components to create a new product (Popadiuk and Choo, 2006). Innovation is a new idea, a new way of action or a new object for an individual. Innovation does not need to be new to the market (Rogers, 2003). A mere idea is not necessarily sufficient to meet the definition of innovation. Innovation is something that has been developed into a product, process, or service and/or commercialized (Popadiuk and Choo, 2006). In digital innovation, analogue information is encoded to digital, i.e., it has been digitized (Yoo et al., 2010). A digital book is an example of digital innovation; the book itself is not an invention or innovation, but when the information is digitized and is presented in a form of a book, it is something that has not previously existed.

Yoo, Henfridsson and Lyytinen (Yoo et al., 2010) recognize that three of the special features of digital innovation are re-programmability, data homogenization (that is, the diversity of data is reduced and structurality grows), and self-referencing. Re-programmability allows a digital device to perform a wide variety of different functions. Data homogeneity means that all data is in digital form after all bits, i.e. zeros and ones. This, for example, allows merging data from many different sources. Data format still often brings issues, because when different tools are used, they are not usually incompatible.

Digital innovation requires digital technology to function. Adoption of digital innovations accelerates when the prices of digital technologies become cheaper, and almost anyone can participate in development and innovation without enormous risk. Diffusion of innovations is a process in which innovation is communicated over time to the social system (Rogers, 2003). Diffusion, the spread or adoption of new information or a new thing can be thought of as a social change. Change may be arbitrary, such as the interactions of individuals, or it may be caused by political restrictions. However, interaction and communication is needed for things to change; knowledge cannot spread without social interaction or mass media (Mahajan et al., 1991; Rogers, 2003). Straub (2009) points out that most of the adoption and diffusion theories assume that adoption takes time and does not happen at once. Because it takes time, beliefs and attitudes influence the decision to adopt the innovation. Another commonality in these theories is the preadoption bias: they all suppose that the goal is to spread information about the innovation to enable its adoption.

In this study, we have presented an example of how workshops can be used to support the diffusion of digital innovations in rural micro-enterprises. We introduce how the Digital path project developed a workshop concept for this purpose, using innovation diffusion and adoption theories as a base, how the workshops were arranged, and how they worked. Innovation diffusion and adoption theories that were used in this study were the Technology Acceptance Model (TAM), the United Theory of Acceptance and Use of Technology (UTAUT) and Rogers's innovation diffusion theory. They are also used in the analysis of the results.

2. Research method, material and procedures

The study was carried out as an action study. Social scientist Lewin

(1946) is considered to have developed the method. He found that to solve social problems, research results must be put into practice. Action research is a way of combining theory and practice, where the objective of the researcher is to change the social system or how it works (Baskerville and Wood-Harper, 1996; Lewin, 1946; Susman and Evered, 1978). Because diffusion can be seen as social change (Mahajan et al., 1991; Rogers, 2003), action research was considered to be a good choice for the present study.

Another reason behind choosing action research is that it is future-oriented; it is supposed to find better ways to get to the desired or desirable goal (Susman and Evered, 1978).

The research material was collected from the project The digital growth path for rural entrepreneurship (in the following, Digital path project). As the research material, we used the memos of the project teams (from 52 meetings, 112 pages of memos), preliminary survey collected from companies (74 responses), a survey of workshops and events (474 responses) and a follow-up questionnaire (110 responses). Before developing the workshop concept, features of the project area were studied through interviews and surveys for development companies and municipal representatives. Development companies are non-profit companies owned by municipalities. Their purpose is to increase the growth and competitiveness of the region's businesses and thus strengthen the region's vitality.

The material was analyzed by content analysis. Qualitative content analysis is one possible method for researching text data. First, all the material was read, and any points that concerned adoption or diffusion of digital innovations or workshops were highlighted. Then the material was re-examined, and the markings were classified, to facilitate analysis of the material. Classification was performed using terms from the innovation diffusion theory, and the TAM and UTAUT models.

3. Rural-urban digital divide

Rural communities have challenges with the quality and availability of digital infrastructure and services. One of the challenges that needs to be considered by service providers and policymakers is the challenge of understanding basic technological infrastructure requirements in rural areas (Velaga et al., 2012). Reducing the digital divide is possible only by considering technological, economic and human factors. For example, only addressing the technological aspect, for example by offering web portals and online advice, is not the whole answer. Addressing the human factor means that we need to offer knowledge and information in a way that considers the learners, and helps them grow their skills and confidence. An empirical study from 2002 in the United Kingdom (Warren et al., 2002) suggests that the emergence of a digital divide may cause a disadvantage within agricultural society.

Economic factors should also be considered. In rural areas, ultra-fast broadband connections may be expensive, and rural communities may not be able to afford them. Slower connections can cause issues for example for e-commerce or remote work, both of which could be one answer for employing communities in rural regions in a time where the need for agricultural workers has decreased.

Regarding ICT adoption in rural areas, there seem to be issues on both the supply and demand sides. Poor technological infrastructure and scarce ICT expertise are examples of supply-side issues. The lack of a need for and information about the benefits of ICT are examples of demand-side issues (Galloway and Mochrie, 2005).

3.1. Rural-urban digital divide in EU

In Europe, the infrastructure for fixed and mobile broadband is not evenly distributed. Fig. 1 shows urban and rural divide of EU and Fig. 2 shows how broadband connections are divided in the EU. There is a profound divergence across European countries and different regions within any given country. A digital divide persists across the EU, and the differences between the countries are not explained by the size of

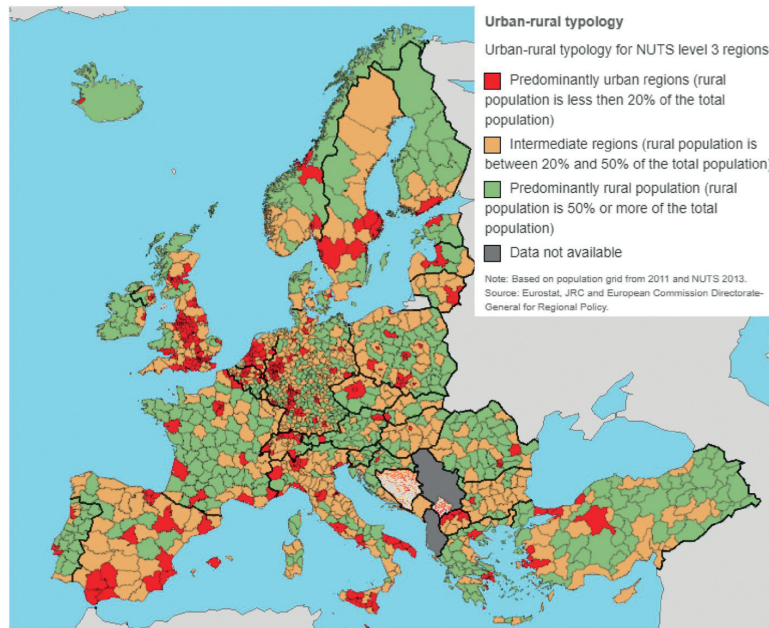


Fig. 1. Divide of rural and urban areas in the EU (Eurostat, 2018).

the population or by the size of the economy. For example, France and Italy do not perform well in comparison of the digital economy in EU countries, although they are two of the largest economies in the EU (Ben et al., 2017).

Small and medium enterprises (SMEs) have more difficulties to fully engage in the digital transformation than bigger enterprises. This is because they have invested less in digital technologies and in the transformation (Ben et al., 2017).

In 2010, EU introduced the Digital Agenda for Europe (DAE). Its goals were to 1) in 2013 for all Europeans to have a basic broadband connection (at least 144 Kbps), 2) in 2020 for all Europeans to have access to a fast broadband connection (above 30 Mbps) and 3) in 2020 for at least half of Europeans to have access to an ultra-fast broadband connection (above 100 Mbps). The first goal, basic broadband connection for everyone, is going well: 97% of Europeans currently have basic broadband access, including 90% of rural households. A clear

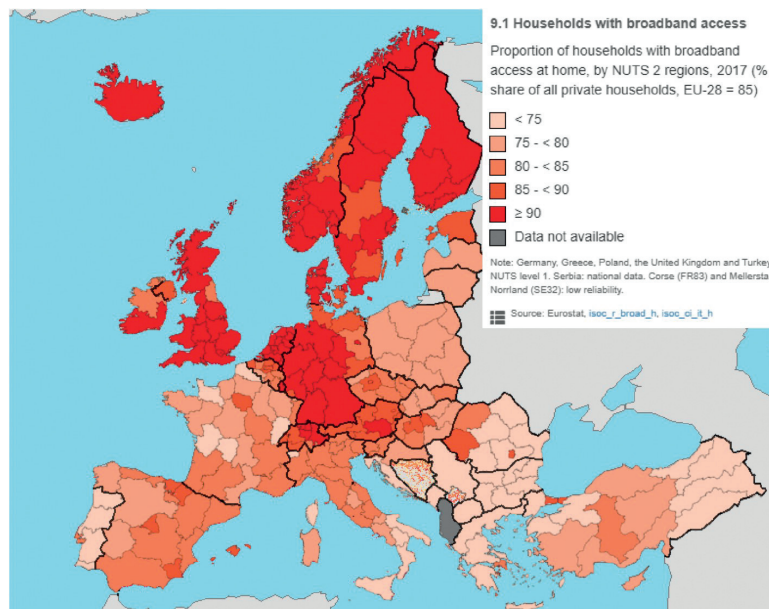


Fig. 2. Percentages of the households with broadband access in the EU (Eurostat, 2018).

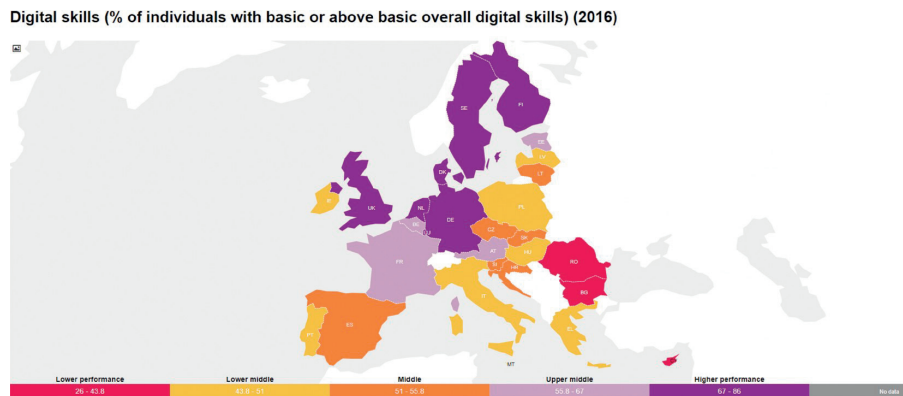


Fig. 3. Digital skills: percentage of individuals with basic or above basic overall digital skills (European Commission, 2016).

digital divide appears regarding the faster broadband connection. Considering the ultra-fast connection, Romania, Sweden and Latvia are the most advanced, covering 40% of the households. In 2015, for example in Italy, Greece and Finland, there is a clear divide in the ultra-fast broadband connection infrastructure between urban and rural areas (Ben et al., 2017).

At the population level, 79% of EU citizens use the internet at least once a week. In the Northern and Western parts of EU, the population uses the internet more than in the Southern and Central-Eastern parts of the EU. The biggest reasons not to use the internet are the lack of internet access and the lack of skills. The two main reasons for the digital divide are usually thought to be

1. Conditions of the internet access and technologies, and
2. ICT skills, internet use and motivations (Ben et al., 2017).

3.2. Rural-urban digital divide in Finland

Finland's population at the end of 2018 was 5, 517, 919, and the population of Central Finland was 275, 521. Finland is sparsely populated. Areas targeted by the Digital path project are mainly rural areas. Statistics Finland (Official Statistics of Finland (OSF), 2019) divides rural and urban regions to seven categories. See Fig. 6. The population centers of urban areas are agglomerations with more than 15, 000 residents. Urban areas are divided into three types:

1. Inner urban area. A compact and densely built area with continuous development.
2. Outer urban area. A dense urban area extending from the boundary of the inner urban area to the outer edge of the continuous built area.
3. Peri-urban area. A part of the intermediate zone between urban and rural, which is directly linked to an urban area.

Rural areas are any areas that have not been identified as urban. The following types are delineated:

1. Local centers in rural areas. Population centers located outside urban areas.
2. Rural areas close to urban areas. Areas with a rural character that are functionally connected and close to urban areas.
3. Rural heartland areas. Rural areas with intensive land use, with a relatively dense population and a diverse economic structure at the local level.
4. Sparsely populated rural areas. Sparsely populated areas with dispersed small settlements that are located at a distance from each other. Most of the land areas are forested.

In 2005 Galloway and Mochrie (2005) argued that for micro-businesses in rural areas, “the most appropriate technologies need not be web based”. In today's Finland, many services are provided through the internet, and they may be hard to get or even impossible to get otherwise. For example, government aids are applied for mainly through web-based services. Finland is one of the leading European countries in the use and adoption of e-government and of ICT skills. Nevertheless, Finland has a clear divide between urban and rural areas when it comes to access to an ultra-fast broadband connection (Ben et al., 2017).

Finland is the leading country in many digital aspects (for example ICT skills), but is lacking behind in enterprises using e-commerce for sale, see Fig. 4. Finnish enterprises are not satisfied with the speed of the internet connection, and are more dissatisfied than European enterprises on average, see Figs. 3 and 5 (European Commission, 2017).

The 100 Mbps mobile network coverage in Finland is close to 90% of homes, see Fig. 7. However, mobile networks do not work at the same speed everywhere and at any time. The speed of the mobile network is affected by, for example, the distance to base stations, the number of simultaneous users, and the weather. A broadband network works better, but its installation can cost over 20000€ in rural areas (Miettinen, 2018).

4. Workshops for supporting diffusion and adoption of digital innovations

Digitalization of companies in the EU is supported, for example, by EU project funding. Digital path is this kind of EU-funded project. The workshop concept was developed to support the exploitation of digitalization in micro-enterprises in Central Finland. In this study, a micro-enterprise is defined as a company with fewer than 10 employees and whose turnover does not exceed 2 million euros. The total balance sheet of the company shall not exceed 2 million euros, and the company should be independent. A company is not considered independent if 25% or more of its capital or voting shares belong to company that is not counted as small company. Small company refers here to company that has fewer than 50 employees and that has turnover not more than 10 million euros, but that is bigger than microenterprise. The University of Jyväskylä operates as a coordinator for the Digital path project. The aim of the project is to provide free workshops for companies from various digital themes including for example web stores, digital customer management, web pages and search engine optimization. The Technology Acceptance Model (TAM), the United Theory of Acceptance and Use of Technology (UTAUT) and Rogers's innovation diffusion theory were used for developing the workshop concept.

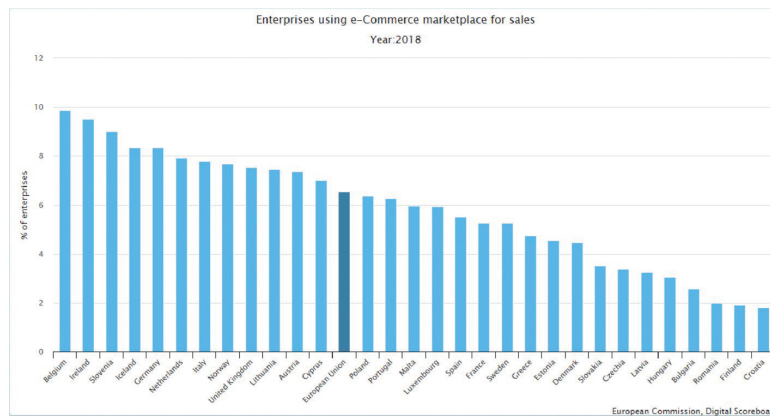


Fig. 4. Enterprises using e-commerce for sale (European Commission, 2018).

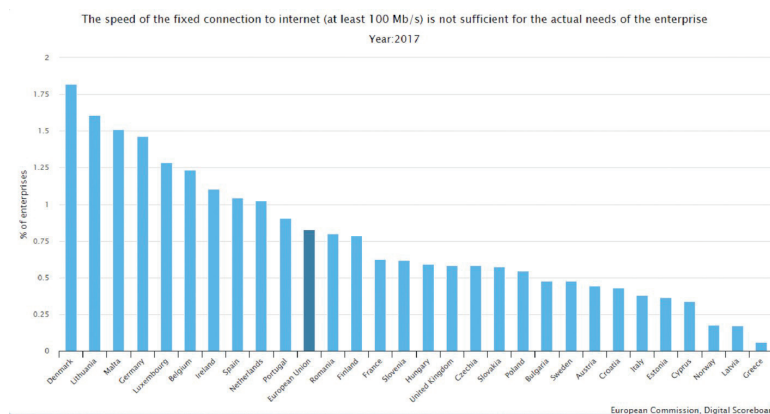


Fig. 5. The speed of the fixed connection to internet is not sufficient for the actual needs of the enterprises (European Commission, 2017).

4.1. Description of the area and digital competence of the micro-enterprises

According to the Regional Council of Central Finland,¹ most enterprises in the Central Finland region are micro-enterprises of fewer than 10 people: 94% in Central Finland, and 93% in the whole country (e.g. agriculture, forestry and fisheries). 280 organizations or companies participated to the workshops. Most of the participating companies were micro-enterprises. Table 1 shows enterprises divided by their turnover. Participating organizations also included 1 project, 26 non-commercial organizations, 2 development companies and 17 municipalities or cities.

The specific features of the project area were studied through structured interviews and surveys for development companies and municipal representatives at the beginning of the project. Businesses in the area are mostly small or micro-entrepreneurs operating mainly in the local market. Challenges for businesses in the region are the lack of purchasing power, finding new customers, aging of the population, young people moving out from the region, access to skilled labor, the lack of broadband network, and the lack of understanding of the possibilities of digitalization. The size of businesses is well illustrated by the fact that there are about 600 companies in one of the targeted municipalities, and the top 15 companies employ 450 people in total, and the remaining 585 companies employ, on average, 1.4 people per

company. There are also pioneers in the area, but most of the companies operate and think traditionally. One of the interviewees identified the “right not to change” thinking in the area as a barrier to business development, and another interview revealed that only some of the companies are growing. Other challenges are the chronic lack of time of entrepreneurs and the fear of change.

There are challenges in the area, but there is also a desire to change. Development companies and municipal representatives have discussed with local entrepreneurs about digitalization and its potential: new ways to find customers, the new services that digitalization allows, e-commerce and internationalization. Entrepreneurs found possibilities of digitalization interesting, but the special vocabulary in the ICT sector was not understood, and businesses would like to have concrete examples. A preliminary survey was conducted for the companies in the area before the workshops. The survey examined the digital competence and needs of the companies. IT skills were self-estimated as average, see Fig. 8. Many respondents, 32 out of 74, estimated that they are basic users, 20 experts, 13 beginners, 3 pioneers, 2 adepts, and 2 thought they did not have any know-how. Typology used here was developed through research.

In the questionnaire it was also asked what aspects the companies have experienced as problematic in the use of IT solutions. The biggest problems are related to their own skills: for example, a person does not have the necessary skills to update their web page, or to target digital marketing to the right customer groups. The lack of time and a low cost-benefit ratio were also seen as problematic. A few (3) respondents said

¹ <http://keskisuomi.info/avainlukuja/aluetuotanto/yrityskanta/>.

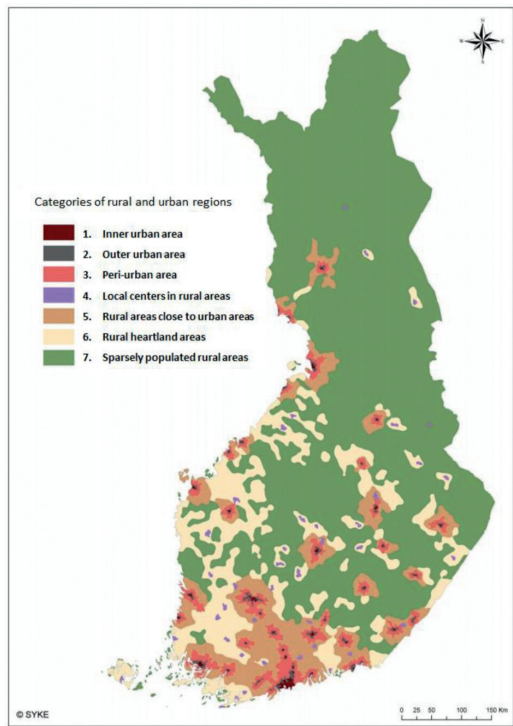


Fig. 6. Rural and urban areas in Finland (Helminen et al., 2013).

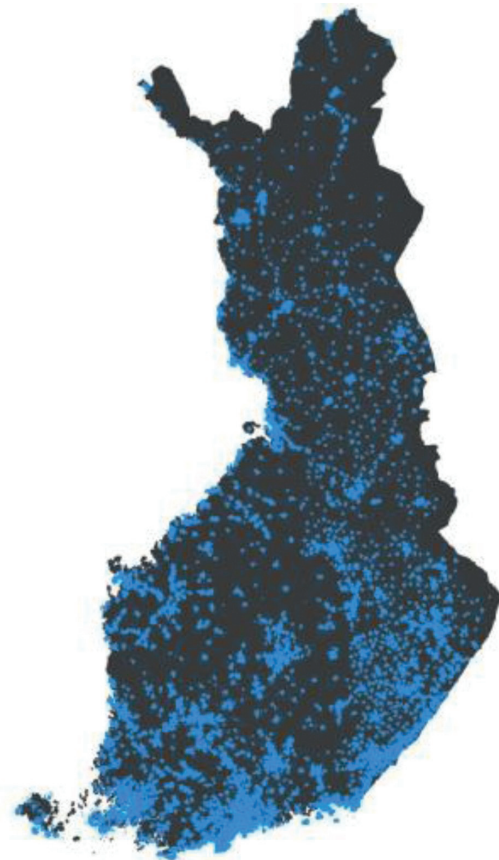


Fig. 7. 100 Mbps mobile network coverage in Finland (T.F.Transport and C.Agency, 2018).

that they did not find it sensible to try new IT solutions, and were not willing to try them. However, the respondents were willing to develop the activities of their companies. For existing IT solutions, more emphasis was placed on marketing solutions. The second most wanted area for development was sales. Sales and marketing are often seen as complementary or even synonymous, so this does not seem surprising.

The questionnaire also asked about the benefits of the use of information technology to the companies. The majority of respondents (36) had applied IT solutions for marketing purposes. Other reasons for using IT solutions included saving time and costs, sales of services or products, smoothness and continuity of processes, efficiency in administration, business development and financial management. Respondents were also asked directly about their wishes for themes for the workshops. Marketing and sales solutions were the most desired topics, but also some surprising topics were suggested: mobile technologies, customer relationship management solutions, and cloud services.

4.2. Planning the workshop concept

Workshop topics were developed gradually. For example, the topic of the first workshop of the project was digital marketing, but later the subject was divided into several areas, because it was too broad to handle at once. Topics are presented in Fig. 9. At its simplest, Rogers's innovation diffusion theory considers that the adoption or diffusion process consists of an innovation, an individual or a community with experience or knowledge about the innovation, another individual or community that does not yet have the knowledge or experience of the innovation, and a communication channel that combines these two (Brancheau and Wetherbe, 1990; Rogers, 2003). Innovation decision-making process refers to the process during which a person adopts or rejects an innovation. There are five steps in the process: knowledge,

Table 1 Participated enterprises divided by turnover.

Turnover	0–2 M€	2–10 M€	10–50 M€	over 50 M€
	219	7	5	3

persuasion, decision, implementation and confirmation (Rogers, 2003). The project team wanted to start from the first step of the process, and attempted to make workshops easy to come by and accessible to rural areas.

According to TAM, created by Davis (Davis et al., 1989; Davis, 1985), two factors have a particular impact on the user's acceptance: perceived usefulness and perceived ease of use. Usefulness means that the user feels that the use of the system improves his performance in the organization. Perceived ease of use refers to how easy the user thinks the system is to use before using it. Ease of use is important for the introduction of a system or innovation, but usefulness is even more important. Users can tolerate a system that is more difficult to use, if its benefits are large enough. User-assessed system utility is, however, different from the real benefit of the system. A user can estimate the benefit to be greater or smaller than it actually is. Later TAM has been updated to a new model named TAM2, which adds three social factors that affect the individual's decision to accept or reject an innovation: subjective norm, voluntariness and image. Subjective norm refers to how the person thinks his close personal relationships think he should

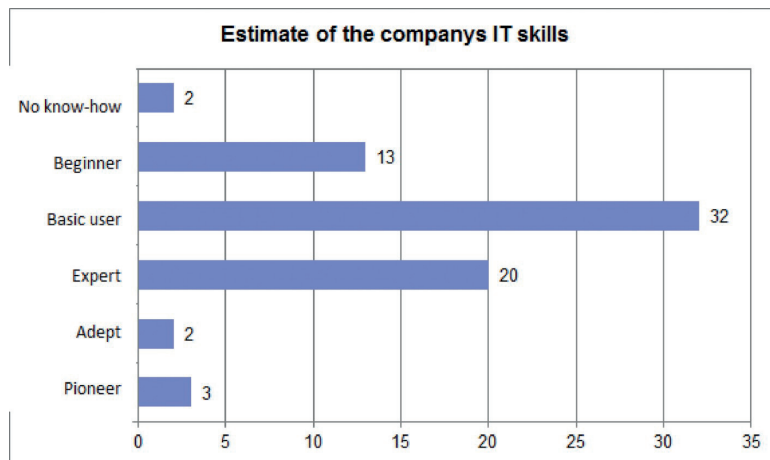


Fig. 8. Self-estimate of IT skills, showing the number of respondents that chose each option.

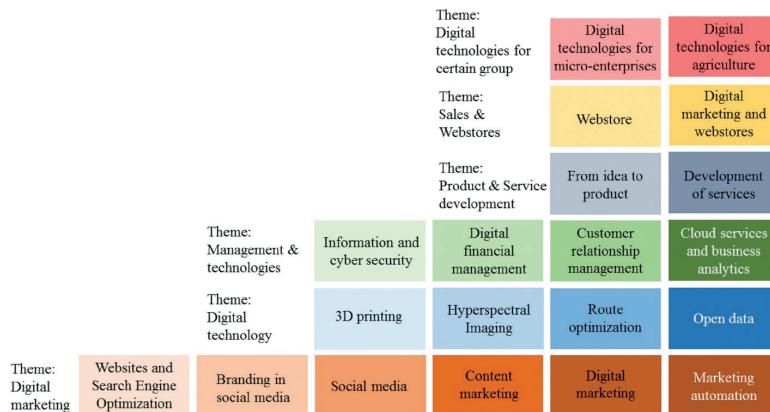


Fig. 9. Topics of the workshops, organized according to themes.

or should not behave. Voluntariness means that the person himself chooses to do something; it is not mandatory. Image refers to the image the person wants to establish or maintain in his social group.

According to UTAUT, created by Venkatesh and Davis (Venkatesh and Davis, 2000; Venkatesh et al., 2003), four concepts explain most of technology adoption and use: performance expectancy, effort expectancy, social influence and facilitating conditions. Performance expectancy refers to how much an individual believes that a system or technology helps in carrying out their work. Performance expectancy predicts best the intent to use, and it is important in both in a voluntary and compulsory situation. Age and gender affect performance expectancy; its impact is higher especially for young men. Effort expectancy means how easy or effortless the individual thinks the use of the technology is. Effort expectancy has an effect especially in the early stages of new behavior. Age, gender, and experience affect effort expectancy; its impact is higher particularly for young women, and at the beginning of the new behavior.

The workshop concept developed in the project has four stages that are based in TAM, UTAUT and Rogers's diffusion of innovation theory (see Fig. 10):

1. Trust building,
2. Lecturing by experts,

3. Example of peers and
4. Participation to workshop tasks.

The first stage of the workshop concept is building trust to others and breaking the ice between participants. Change agents are often higher educated, and their socioeconomic background differs from the social system they are trying to influence (Rogers, 2003). This is why building trust among the participants and change agents was considered important. Rogers (2003) points out that in general, ideas are easy to communicate between similar people. Khrais (2018) and Werber, Baggia and Žnidaršič Werber et al., 2018 also include trust in their expanded model based on TAM. Participants in workshops must therefore feel like they are in a situation among their peers they can rely on.

The second stage of the workshop concept is providing information about the innovation to participants: what it is, how it is used and what one can achieve by using it. The information is shared by an expert. According to TAM, perceived usefulness and perceived ease of use are important factors when individual is adopting an innovation (Davis et al., 1989). According to UTAUT, performance expectancy and effort expectancy are important factors when adopting an innovation (Venkatesh et al., 2003). According to Rogers's innovation diffusion theory there are five stages in the innovation decision process:

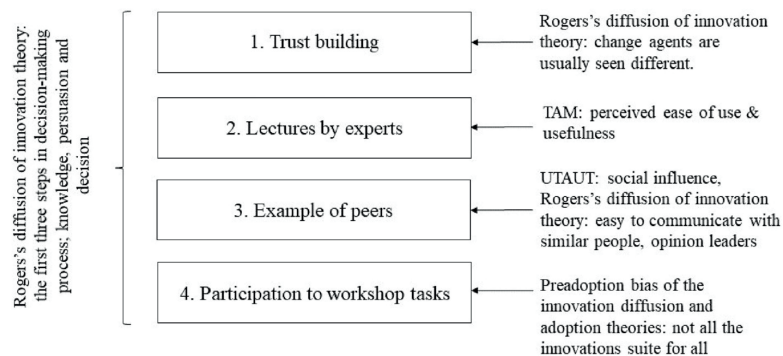


Fig. 10. Topics of the workshops, organized according to themes.

knowledge, persuasion, decision, implementation and confirmation (Rogers, 2003).

The third stage of the workshop concept is the example of peers. TAM2 adds social influence to TAM, and it considers that an individual can act according to subjective norms (Venkatesh and Davis, 2000). In addition, UTAUT considers that social influence affects the adoption of an innovation (Venkatesh et al., 2003). In Rogers's innovation diffusion theory, opinion leaders have an influence on innovation diffusion by affecting others' opinions of innovations (Rogers, 2003). For example, Valente and Davis (Valente and Davis, 1999 and Puska et al. Puska et al., 1986 support the use of opinion leaders to accelerate the diffusion of an innovation. In the third stage of the workshop, local entrepreneurs were used as opinion leaders to explain how they have used the innovation and how useful it has been.

The fourth stage of the workshop was the workshop itself where participants could think and reflect on how they can use the innovation. Workshop tasks were performed by using the facilitation methods. Facilitating methods refers to methods that help to lead workshops so that each participant as a person and their creative input is taken account. The project team wanted people to think about the use of the innovation by themselves. Participants were usually divided into small groups so that they had room to speak, but still also had support of the other participants. Not all innovations are useful or desirable to all (Rogers, 2003). This is why it is important that participants think the use of the innovation by themselves, so they can decide if the innovation is suitable for them or not.

5. Evaluating the workshop concept

The project has been running since the start of February 2016, and has organized 43 events or workshops about digital innovations (see Table 2) in 18 different locations. Participants have made approximately 800 visits to workshops. The project ended at the end of February 2019.

5.1. Communication

Communication channels play a major role in the adoption and diffusion of innovations at all stages of the innovation decision-making process (Brancheau and Wetherbe, 1990; Rogers, 2003). Communication was thought to be big part of the project's success. Mass media has less influence on decision making than personal communication (Valente and Saba, 1998, and role of the mass media in this project was kept small. Communication from municipalities, development companies and entrepreneurial associations to local entrepreneurs had a big role. At the beginning of the project, it was decided that the project would not spend money on newspaper advertising.

Communication is, for example, one of the core activities in Rogers's

innovation diffusion theory (Rogers, 2003). Without communication, innovation cannot spread. The communication channels chosen for the project did not change greatly during the project. The role of municipalities and development companies in communication was important throughout the project. Other communication channels were local entrepreneur associations, social media, event calendars and media releases. Most of the participants heard about the events and workshops through municipalities and development companies (136 respondents), but the second largest group (122 respondents) heard about the workshop from personal e-mails, from others' personal recommendations, event calendars, and other similar channels.

The higher education and better knowledge of digital innovations of the change agents posed a challenge for effective communication between the change agents and participants. Although the project team knew that they should use easily comprehensible language, they still used the special vocabulary of the field (for example customer relationship management). In some cases, participants in the workshops mentioned that they did not understand the terms used, or that they were difficult to understand. This certainly affected, for example, the number of participants in workshops on the more difficult topics.

Another challenge related to communication was the internal communication of the project team. The project team organized a meeting every time before an event or workshop, so that everyone knew what their role in the workshop was. Successful target group communication does not necessarily guarantee a successful workshop; also internal communication must work.

5.2. Opinion leaders

Local entrepreneurs were used in the workshops as an opinion leaders. In the workshops, they presented how they had used digital innovations and what benefits they had achieved. Project team memos show that the project team itself was happy with this practice. However, the presentations of the example companies were not completely trouble-free. The participants' feedback and project team memos show that the presentations varied in quality, and not all those selected as an example company were considered as a good choice after the fact.

The project team approved most of the chosen example companies before the company concerned was involved. When the project team chose the opinion leaders, they used the internet and the municipalities' representative or the development companies' recommendations to choose the companies. This method did not necessarily find the best opinion leaders. Often opinion leaders can be identified by examining the personal networks of individuals; opinion leaders have supposedly more contacts outside of the social system than other individuals in the social system [39]. The project had no resources to do research on networks of entrepreneurs, so opinion leaders had to be chosen by the project team. Other people in the social system evaluate how credible

Table 2

Table of satisfaction of the workshop, perceived benefit and realization of the planned action. *n* refers to the number of respondents. Satisfaction of the workshop and perceived benefit do not always match.

Topic of the workshop	Perceived satisfaction of the workshop: The respondent was satisfied with the workshop	The respondent found the workshop useful (Perceived benefit was a lot or some)	Realization of the planned actions: the respondent took planned action after the workshop
Digital marketing (n 49)	90%	35%	78%
Social media (n 19)	95%	68%	42%
Customer relations management (n 2)	100%	100%	50%
e-commerce (n 5)	100%	100%	40%
Information security (n 6)	67%	67%	33%
Cloud services and business analytics (n 3)	67%	67%	33%
Marketing automation (n 2)	100%	100%	0%
Service design (n 4)	100%	50%	0%
Digital technologies for agriculture (n 6)	83%	83%	17%
Digitization financial management (n 1)	100%	100%	0%

and trustworthy the opinion leaders are: whether or not they really know the innovation well, and how well they are able to use it to their advantage [39].

5.3. Change agents

The project team can be seen as change agents: they try to affect innovation diffusion. Change agents differ in their background, education, and expertise from the participants of the workshops. The project team wanted to reduce this gap, and in the workshops, their role was to carefully guide the work of the participants without giving them answers or directing their work too much. It was seen important that participants consider and ponder the use of the innovations by themselves.

In several workshops, part of the work was brainstorming. It that was found to be difficult for both the project team and the participants. It would be good to pay attention to both external and internal communications, since internal communication within the project also plays a major role in the project's success.

The role of change agents in innovation diffusion is complex. Their expertise, which is supposedly higher than the members of the social system, is important, but the differences between the change agents and participants' knowledge and backgrounds should not be ignored. It may be difficult for people working as experts to break away from their usual role and give space to the participants' own ideas and thoughts. On the other hand, the expertise of the change agents can also be utilized in workshops. Change agents thus have a twofold role: they share knowledge and make use of their expertise, and act as an impartial facilitator during brainstorming.

5.4. Trust

During the workshops, efforts were made to build trust. Various methods of facilitation emphasize that at the beginning of the workshop, it is important to break ice and build trust. It is difficult to think of new ideas if you do not trust the situation and the people in it. For example, Rogers (2003) points out that in general, ideas are easily communicated between similar people. Participants in workshops must therefore be aware that they are in a situation among their peers they can rely on. The project team paid attention to the building of trust in the workshops. Nevertheless, the memos show that this did not always work. Participants did not want to share their ideas to others, which shows that they do not trust the other participants or the change agents. Some participants wrote in the feedback questionnaire that they did not want others to steal their ideas.

Although building trust was found to be important right from the

beginning of the project, it was not always successful. Especially in workshops, where the focus was on the brainstorming, building trust was considered to be important. Trust between the participants and between participants and change agents could create better opportunities for business development.

6. Effect of the workshops on diffusion and adoption of digital innovations

Overall the feedback from the participants was good. 474 persons answered the feedback survey, and most of them thought that the workshop or event was good or excellent. 266 persons answered that they benefited from the workshops to some extent, and 176 persons answered that they benefited from the workshops a lot.

Participants were asked to estimate how likely it was that they would take action after the workshop, see Fig. 11. 413 persons answered this question. Out of them, 190 answered that it was quite likely that they would take action after the workshop, and 181 persons thought that it was likely that they would take action after the workshop. These two groups comprise 90% of the respondents, which seems to support the conclusion that the workshops were useful for promoting innovation diffusion. Of course, this does not mean that all of these people really took action. What we can say is that they had a positive attitude towards the digital innovations presented, enough knowledge to think that they could do something, and that they already planned what to do with the innovations. 329 answered to open ended question what they are planning to do after the workshop (Appendix). This can be seen quite positively: many thought that digital innovation was useful and they had enough information to do something with it after the workshop. There are also many (83) respondents that thought they need more information, but good thing is that they were interested enough to plan to look more information.

Some time (2 weeks to a month) after the workshop, participants received a new survey asking if they had used the innovations and taken action. 110 persons answered this survey. 20 persons answered that they still thought that workshop was useful for them, 65 persons answered that the workshop was useful for them to some extent, 21 persons answered that it was a little useful, and one person answered that the workshop was not useful for them. 108 persons answered to question if they had taken the action they planned in the workshop, see Fig. 12. 39 persons answered that they had done the planned action, and 69 had not done the planned action. In percentage terms, this means that 36% of the respondents took planned action. 105 persons answered the survey question on whether they had taken some other action inspired by the workshop. Out of them, 32 answered yes, and 73 no. This means that 30, 5% took some other action inspired by the

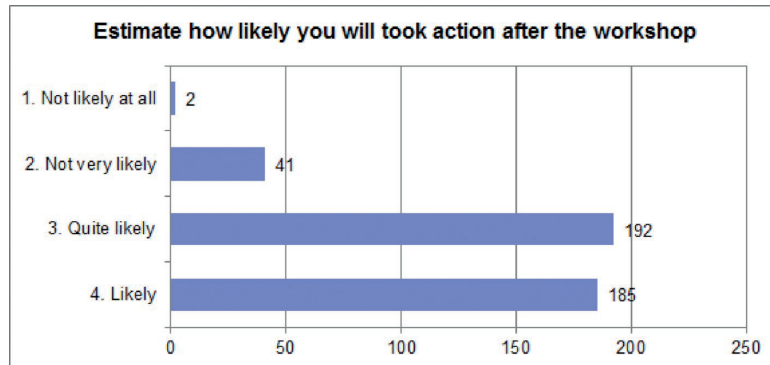


Fig. 11. How likely participants thought they would take action after the workshop, showing the number of respondents that chose each option.

workshop. Summing up the results from the previous two questions, this means that out of all respondents, 58% took some action (planned or other) after the workshop. However, it is possible that those who answered the follow-up survey were more active than those that did not answer the survey.

The workshops had also other benefits. 20 persons had found a new business partner, and participants were acquainted with other local entrepreneurs. Only three persons thought that they workshops did not help them to get acquainted with other entrepreneurs. Fig. 12 shows a table of the perceived satisfaction in the workshop, perceived benefit, and realization of the planned actions by topic. As expected, more people thought that the workshop was useful than really took action.

Workshops seem to be useful way to support the diffusion and adoption of digital innovations for micro-enterprises. Participants thought workshops were useful and planned how they could use digital innovations in their business. Before workshops, in the preliminary survey, digital marketing was found as the most interesting topic. This was seen also in practice throughout the project: digital marketing workshops (for example about social media, websites and search engine optimization and branding in social media) were the most popular ones.

7. Discussion

We suggest that key elements for supporting diffusion of digital innovations in rural micro-enterprises are communication, opinion leaders, change agents and trust. These are the things we can pretty easily influence. Of course, for example, change resistance and overall conditions (laws, regulations, internet infrastructure etc.) also matter, but they are not so easily affected by change agents.

Answers of the questionnaire seem to support the conclusion that workshops were useful for promoting diffusion of innovations in the rural area of the Central Finland. Although workshops were found successful in some aspects, there were also some issues. Participants did

not follow through with their planned actions. Participants did not answer as actively to the follow-up survey (110 answers) than they did to the feedback survey (474 answers). We can only guess why the participants did not follow through with the actions: maybe it was because there were no other measures to support the actions, or they lack in time or competence to follow through. This should be studied further to understand why, and how to better support the workshop participants.

Another challenge was the remoteness of the rural area: distances were long for some of the entrepreneurs, and they had to travel a long way to get to the workshops. The number of residents in villages were between 1, 375 and 19, 374, and the number of the participants in the workshops varied. Sparsely populated areas have also a disadvantage with regard to digitalization: where there are fewer people, the usage rate of their personal connections is lower, and digital innovations usually spread the most effectively between personal connections (Park, 2017).

The aim of the project was to provide free workshops about digital innovations that are easy to come by for local micro-enterprises. The plan was to implement workshops so that the language used would not be too difficult, and that regardless of the participants' level of digital competence, they would get some new information about the topic. It was a problem that the digital competence of the participants varied a lot, with some not even having basic knowledge. These entrepreneurs would perhaps need education about using smart phones or the internet before they can successfully use digital innovations such as web stores, search engine optimization, or social media for marketing purposes. Some of the participants asked for webinars, but it may be quite difficult to arrange webinars, if the target participants do not have enough digital competence to use such technology.

Used innovation adoption and diffusion theories, Rogers's innovation theory, TAM and UTAUT, seem good choices as a base for the developed workshops and as a lens for analyzing the data, but there is

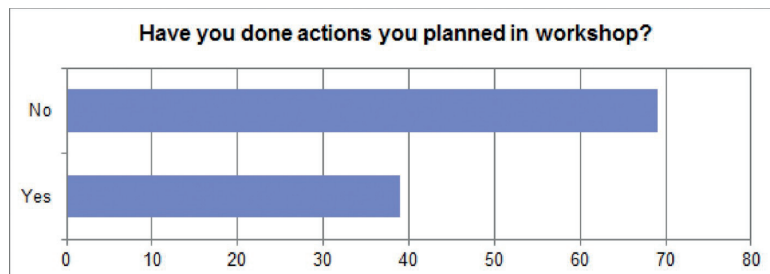


Fig. 12. Results of follow-up survey on whether the participants had taken the action they planned during the workshop.

preadoption bias with these theories: not all the innovations suite for all. Future research could develop a model for identifying suitable innovation for the user. Innovation resistance should be also considered, because it can be major problem for innovation diffusion.

Digital path project lasted three years. This is quite limited time to reach the rural enterprises and to support the diffusion and adoption of digital innovations, because diffusion of innovation usually takes time (Rogers). This is why project team decided to focus to the three first steps of Rogers's decision making process: knowledge, persuasion and decision. The last steps, implementation and confirmation were given less attention. Used workshop concept seemed to support the first three steps of the decision making process as planned, but to support the implementation of the digital innovations, the concept should be improved and include more implementation support for the enterprises.

Some of the workshops revealed that some entrepreneurs did not have a clear idea of what their business idea was, or who their customers were. This was also a bit problematic, for example, when the participants were planning using paid Facebook ads: if you do not know what you are selling, or to whom you are selling, marketing does not usually work as desired. These entrepreneurs could maybe use some help to develop their business before they can successfully use digital innovations and achieve the full potential of digitalization. There are no easy answers to these challenges, and any one actor or project cannot answer them all.

8. Conclusion

Compared to urban communities, rural communities do not have equal opportunities considering digitalization, because there infrastructure is often lacking, internet connections are slower, and fast broadband connections are more expensive (Velaga et al., 2012; Townsend et al., 2013; Philip et al., 2017). There are may also be fewer options when selecting broadband provider (Ashmore et al., 2017). The rural-urban digital divide can not be answered by considering only technological or economic factors, but one must also consider human

Appendix A

Questionnaire answers: What are you planning to do after the workshop? Open end answers are bundled by the action. Number of respondents: 329.

Action	Number of respondents
Branding of my expertise/company	3
Build a mobile application	1
Build a website	11
Develop current website	48
Develop customer relationship management	4
Develop information security of the company	17
Develop more content for marketing	9
Develop services of the company	8
Expand my network	5
I'm planning to learn more about the topic	83
Identify customer segments	5
Identify marketing channels	4
Identify marketing goals	1
Monitor and measure marketing	1
More systematic use of marketing	7
More systematic use of social media for marketing	48
Nothing new/different	4
Plan more for starting a webcommerce	12
Search Engine Optimization	13
Share what I have learned to others	20
Start a webcommerce	3
Start using digital marketing	1
Start using social media for marketing purposes	16
Start/develop current e-mail marketing	2
Starting a blog	5
Try facilitating methods in my work	9
Try to activate customers more in social media	1

factors, for example, the digital skills of rural communities (Warren et al., 2002). The aim of the action research was to develop a workshop concept that can be used for supporting adoption and diffusion of digital innovations in rural micro-enterprises. Developed workshop concept used Rogers's innovation diffusion theory, TAM and UTAUT as base, because they are well-known theories of diffusion and adoption of innovations and they seemed to fit well in this case. Terms from these theories were used for classification of the research data. The knowledge of digital innovations in micro-enterprises in rural communities can be improved with free workshops that are easy to come by. Developed workshop concept seems to support the conclusion that workshops were useful for promoting diffusion of innovations in the rural area of the Central Finland. A challenge is how to better support the implementation phase in micro-enterprises. In this study, about one third of the participants that answered the survey questionnaire, took action after the workshop. This number may be biased, because it is possible that those who answered were more active than those that did not, so the real number can be even smaller. Ben et al. (2017) estimated that "by 2020, 90% of jobs will require some digital skills". This means that if the digital divide of rural and urban areas stays the same, or even grows, rural areas are facing serious trouble. It is important to inform the politicians that the rural-urban digital divide is a critical issue. The main contribution of this paper is that it presents a real-life case for supporting diffusion and adoption of digital innovations to micro-enterprises in rural areas. The material used for this article is authentic, and describes a possible method for promoting the diffusion and adoption of digital innovations, as well as its challenges.

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Use automation for marketing	4
Use cloud services	1
Use Facebook ads for marketing purposes	17
Use more pictures for marketing purposes	2
Use more targeted marketing	5
Use more videos for marketing purposes	7

Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrurstud.2019.09.010>.

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III

BUILDING TRUST IN THE SHARING ECONOMY: CURRENT APPROACHES AND FUTURE CONSIDERATIONS

by

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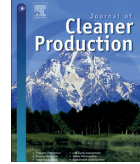
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Review

Building trust in the sharing economy: Current approaches and future considerations

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ABSTRACT

The sharing economy could be an answer to the challenge of sustainability; it can facilitate the sharing and reuse of resources, create new ways of earning money, and enhance social connections. For example, by reducing the use of natural resources without having to acquire or own everything, the sharing economy can positively affect sustainability. At the core of this type of economy lies trust among users and between users and the platform—the system cannot reach its full potential without trust. In fact, businesses or organizations in the sharing economy can even fail due to trust issues, although more information is needed to make better use of the existing platforms. The aim of this systematic literature review is to study how trust is built in the sharing economy. For this purpose, we introduce 28 solutions to support trust in sharing economy platforms, develop a preliminary model for evaluating trust in this context, and present a few considerations for future research. Platform developers and managers can use our preliminary model to identify trust issues in their platforms.

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1. Introduction

The world's population is increasing, and this mean an increase in the use of resources. Accordingly, there is a need for solutions to support a more sustainable way of living and doing business. The sharing economy can be one solution for promoting sustainability. The sharing economy enables the use of expensive physical assets without a need to purchase. For example, fashion has a significant environmental impact, and renting or loaning high-end fashion items can reduce the effects on the environment (Zamani et al., 2017). The sharing economy can also make products and assets more affordable (Leung et al., 2019; Schor, 2016) and offer new ways of earning money (Schor, 2016). Further, it can reduce information asymmetry (Thierer et al., 2016; Zloteanu et al., 2018) through digital platforms, be more democratically organized (Schor, 2016), and ecological than traditional businesses (Bocken et al., 2014; Martin et al., 2017). Related to sustainable business models, Bocken et al. (2014) identified different archetypes, such as under-utilized assets and capabilities, market places for second-hand goods, social enterprises, and collaborative models. These archetypes form an important part of the sharing economy. However, whilst the sharing economy certainly provides several benefits, the question remains why it is not more widely used, and why some sharing economy organizations or companies fail.

Cohen and Munoz (2016) examined a personalized bus service (named Kutsuplus) that was launched by the city of Helsinki in Finland, which was a hybrid traditional bus service and ride-sharing scheme. The idea seemed good, supported sustainability, and offered a more customized service. However, it failed within the same year, because economic profitability did not rise in line with popularity during the experiment (Kutsuplus-kokeilun loppuraportti, 2016). Another example of a failed scheme is Duara Travels, which was a new kind of travel agency where travelers could stay in villages in developing countries and live with and like local people. The company ensured that all the families and villages engaged in the scheme were safe for tourists and conducted all the marketing and booking. Prices were fair, and host families received 40% of the payment. Despite seeming effective for supporting responsible tourism in developing countries, Duara Travels failed, as it did not establish a sufficient customer base (Duara Travels, 2020). The reasons for these failed projects have led several authors to suggest that distrust of companies in the sharing economy (and their services/products) hinders its positive effect and may lead to failures (Chasin et al., 2018; Cherry and Pidgeon, 2018). In other words, by increasing trust toward sharing economy platforms, companies can increase the positive effects and strengthen individuals' decisions to use such platforms (Arteaga-Sánchez et al., 2018; Edbring et al., 2016; Hawlitschek et al., 2018b). Still, the significance and mechanisms of trust development within the sharing economy are largely unexplored (Cohen and Munoz, 2016).

To identify the factors that affect trust in sharing economy platforms, we conducted a systematic literature review. More specifically, we aimed to identify 1) how existing studies define the concept of trust, 2) which aspects of trust in the sharing economy have been studied, 3) which technology solutions have been used to build trust in sharing economy platforms, and 4) how to evaluate trust in the sharing economy. By investigating these issues, we aim

to clarify the factors that facilitate the building of trust in sharing economy platforms and offer suggestions for future studies on the topic. Moreover, we answer the call by Bijlsma-Frankema and Rousseau (2015) to provide a better overview and synthesis of the existing research on trust. The novelty of this study lies in its collection, comparison, and synthesis of the relevant literature.

The paper is structured as follows. The introduction provides the rationale for the study and introduces key vocabulary. Section 2 outlines the research method and explains how the research was conducted. In Section 3, the research findings are presented. In the final chapter, we discuss the results and present conclusions on their significance, practical implications, and future research topics to help other researchers focus on the most relevant issues pertaining to the sharing economy.

1.1. Sharing economy

The sharing economy is here to stay. Its economic value has been predicted to grow from US\$ 15 billion in 2014 to US\$ 335 billion by 2025 (Statista, 2019). For example, the well-known accommodation platform Airbnb made a profit of US\$ 93 million in 2017, from total revenues of US\$ 2.6 million (Bort, 2018). The sharing economy has been studied to some extent, but defining it remains a subject of debate (Cherry and Pidgeon, 2017). One point of universal agreement is that the sharing economy involves interaction between people (Barnes and Mattsson, 2016; Carbone et al., 2018; Future of Money Research Collaborative et al., 2018; Hou, 2018; Ma et al., 2019), for example, in the context of collaborative consumption it can be seen either as a subset of the sharing economy (Belk, 2014; Hamari et al., 2016) or as a synonym for it (Martin et al., 2017). Terms related to the sharing economy include the gig economy, peer-to-peer economy, on-demand economy (Hou, 2018; Ertz and Leblanc-Proulx, 2018; Future of Money Research Collaborative et al., 2018; Martin, 2016; Tsui, 2016), access-based consumption, and crowd-based capitalism (Ertz and Leblanc-Proulx, 2018). Thus, the taxonomy used to capture the sharing economy is unclear, and the relationships between subsets or terms involved remain vague.

The sharing economy can be thought of as a business or supply chain model that uses digital platforms to connect consumers (Hou, 2018). The purposes of these platforms include short-term rentals, ride-sharing, or the sharing of information (Hou, 2018). Schor (2016) suggests that both platforms and the press define who is considered part of the sharing economy. Roos and Hahn (2019, p. 681) propose the following definition: "collaborative consumption is based on the effective management of collaborative, shared use of used, common, or idle resources (i.e., products, assets, or services)."

The sharing economy can be divided into four categories: "recirculation of goods, increased utilization of durable assets, exchange of services, and sharing of productive assets" (Schor, 2016, p. 2). Further, it can be categorized according to groups of innovations: 1) accommodation sharing platforms, 2) car and ride sharing platforms, 3) peer-to-peer employment markets, and 4) peer-to-peer platforms for sharing and circulating resources (Martin, 2016). Sharing economy platforms can also be assigned to one of four models: chaperones (prototypical example: Airbnb); franchisers (prototypical example: Uber); gardeners (prototypical

example: Couchsurfing); and principals (prototypical example: Handy). Chaperone and franchiser platforms exhibit a high level of rivalry among participants, with loose control by chaperone platform owners compared with tight control exerted by franchiser platform owners. There is low rivalry among participants in gardener platforms, with only loose control used by platform owners. Finally, low rivalry exists among participants in principal platforms, where platform owners exert tight control (Constantiu et al., 2017.)

Within the context of this study, we define the sharing economy as a way of sharing a resource (know-how, assets, or information) safely, with or without payment, with other people through a digital platform. Important aspects of this definition are that access to resources is temporary and that sharing happens relatively safely. Usually, the safety of transactions is ensured using technological solutions.

1.2. Trust in the sharing economy

The sharing economy is increasing rapidly providing users with certain benefits; however, some crucial aspects remain understudied. In particular, the significance and mechanisms of trust development among the sharing economy are largely unexplored (Cohen and Munoz, 2016). While people have always shared resources, this mainly occurs in interaction with strangers within the sharing economy (Frenken and Schor, 2017). These interactions with unknown parties can be highly risky, potentially resulting in financial and other losses (Luhmann, 2000). Consequently, trust is an essential element within sharing economy platforms, as noted by the Future of Money Research Collaborative et al. (2018).

Essentially, trust-based issues within the sharing economy are born out of distrust for old institutions (Lub et al., 2016). Before the industrial era, trust was developed primarily among family members. However, after the industrial revolution, this system was superseded by trust built between strangers through the use of licenses (Hou, 2018). Trust issues in society, such as fundamental distrust (Lub et al., 2016) and trust in the internet economy (Hou, 2018), enabled new kinds of businesses and supply chains to emerge. Recent generations also conceptualize values and attitudes differently: ownership is less important to them than access (Lub et al., 2016). In light of these factors, an accurate understanding of the different aspects affecting trust-building within the sharing economy is essential. This understanding will facilitate the development of better and safer platforms, help inform the public about risks to avoid a false sense of security, assist in the building of better business plans, and promote improved strategic decision-making within the sharing economy.

2. Research method

To conduct a systematic literature review, we followed recommendations by Webster and Watson (2002). Prior systematic literature reviews can be divided into two different types: conventional studies (which may employ meta-analysis) and mapping studies (Kitchenham et al., 2010). This study applies a mapping approach to discover what is known about a certain phenomenon—trust in the sharing economy. By recognizing and categorizing elements that affect trust, we can find ways to better support trust among sharing economy platforms.

2.1. Search process

We followed an established protocol to minimize bias in the systematic literature review (Brereton et al., 2007). We first selected the most relevant keywords for the review, which included

"trust," "sharing economy," "peer-to-peer economy," and "gig economy." On initial review of the existing literature, we noted the fragmented nature of available literature. For this reason, we chose not to constrain our scope in the study to any specific journals, research method, or scientific fields. This literature review presents transdisciplinary research in which researchers try to find a "more general and common body of knowledge beyond the disciplines" (Sakao and Brambila-Macias, 2018). Those studies reviewed were from the fields of sustainability, information systems, economics/business, sociology, tourism, and law.

The second step was to select relevant databases for the queries. Because of the fragmented nature of the literature, we chose five widely recognized and reliable databases, which we consider to contain a good sample of the sources in terms of breadth and depth, as follows: Academic Search Elite (EBSCO), Science Direct, SAGE Journals Online – SAGE Premier (SAGE), Association for Information Systems Electronic Library (AIS eLibrary), and ProQuest – Science Database (ProQuest). The following research strings were used for the search to find the most relevant literature: trust AND ("sharing economy" OR "peer-to-peer economy" OR "gig economy" OR Uber OR Airbnb).

Trust was a term used in all the searches because it was a key element. The sharing economy has many subsets and synonyms, which is why "peer-to-peer economy" and "gig economy" were included as search strings. We were also aware that other synonyms such as peer-to-peer rental markets, crowd-based capitalism, on-demand economy, access-based consumption, and collaborative consumption also exist. However, these were discarded as they were rarely used and had little impact on search results. Because the search terms "sharing economy," "peer-to-peer economy," and "gig economy" produced insufficient results in matter of volume, we added the terms Airbnb and Uber. These two platforms have been catalysts for the growing interest in the sharing economy (Martin et al., 2017), and are thought to be dominant platforms (Geissinger et al., 2019).

2.2. Inclusion and exclusion criteria

The search was limited to peer-reviewed academic journal articles. We excluded conference publications as their reliability is more challenging to assess. We also set English as a criterion for the language to ensure valid interpretation. Our search was conducted without including any temporal criteria. The keywords were searched mainly from abstracts; however, in some cases, this resulted in very few or no search results. In these cases, the search criteria were expanded to include the body text. This provided more results but often led to results that were outside the research scope. For instance, this was evident in cases where a study only mentioned the sharing economy as an example. In such situations, an article was excluded from the review (Table 1). This approach follows the work of Brereton et al. in which they suggest that abstracts are often of "too poor quality to determine whether papers are relevant to specific research questions" (2007, p. 581).

By using these criteria, we identified 238 articles that were considered suitable for inclusion in the study. After removing duplicates, we went through all the remaining studies manually and eliminated those that did not contain research on trust in the sharing economy. This left 60 articles (see Table 1). We also found one literature review about trust antecedents in the sharing economy by Ter Huurne et al. (2017). This important work focuses on sociological and psychological issues of trust in the sharing economy. However, it did not consider the technological aspects of the phenomenon. Furthermore, most of the studies reviewed by Ter Huurne et al. (2017) were published in 2016 or earlier, whereas a notable portion of the papers reviewed in our study are published

Table 1

Search results of the literature review. Table shows how many articles were found from the databases and how many were included in this study.

Database	Search string	All results	Selected articles
EBSCO	sharing economy AND trust	14	8
EBSCO	Airbnb AND trust	5	2
EBSCO	Uber AND trust	21	0
EBSCO	trust AND peer-to-peer economy	0	0
Science Direct	sharing economy AND trust	21	17
Science Direct	Airbnb AND trust	9	9
Science Direct	Uber AND trust	11	0
Science Direct	trust AND peer-to-peer economy	21	2
SAGE	sharing economy AND trust	6	6
SAGE	trust AND peer-to-peer economy	6	2
SAGE	trust AND Airbnb	2	2
SAGE	trust AND Uber	5	2
AIS eLibrary	sharing economy AND trust	21	9
AIS eLibrary	trust AND Airbnb	23	7
AIS eLibrary	Uber AND trust	31	4
AIS eLibrary	trust AND peer-to-peer economy	5	1
ProQuest	sharing economy AND trust	22	15
ProQuest	trust AND Airbnb	11	4
ProQuest	trust AND Uber	2	0
ProQuest	trust AND peer-to-peer economy	1	0
	Total number	238	90
	After removing duplicates		60

Table 2

The number of articles arranged by the year of the publication. Most articles were from the years 2016–2019.

Year	Number of Articles
2019	11
2018	26
2017	11
2016	9
2015	1
2014	1
2013	1

from 2017 through 2019 (Table 2). Hence, it can be assumed our study amplifies the work of Ter Huurne et al. (2017) and answers their call for more studies on trust in the sharing economy.

3. Results

In this section, the findings of the systematic literature review are presented and categorized based on the research questions outlined in the introduction.

3.1. Defining the concept of trust

Trust is an abstract concept that is evidently difficult to understand or define. It is necessary for research papers to define trust because it can be interpreted differently according to the geographical area or culture, for example (Lyon et al., 2012). From our sample, only 24 of the 60 studies defined trust: 15 provided a more traditional definition, and 9 studies defined trust specifically with regard to digital environments. Trust defined in traditional contexts can be considered a leap into the unknown, where there is a possibility of betrayal, but we think there is enough evidence of trustworthiness to take the risk and trust (Gambetta, 2000; Lewis and Weigert, 1985; Luhmann, 2000). For example, Mittendorf (2018, p. 379) used following definition of trust which we include to traditional definition: "This paper follows the sociological view of trust coined by Luhmann (1979), understanding trust as a collective attribute that is created from interactions between different parties." These traditional definitions are considering more

psychological and sociological aspects and do not include technological aspect.

Authors who took the digital environment into account when defining trust include Wang and Jeong (2018, p. 163), who define e-trust as follows: "e-trust means general beliefs in online service providers that result in behavioral intentions." Interestingly, more than half of the studies ($n = 36$) provided no definition of trust, perhaps due to its abstract nature and the consequent difficulty of defining it in detail. Nevertheless, it is surprising that so many authors provided no definition. This is somewhat concerning, as abstract terms that can mean different things to different people can easily lead to misinterpretation. For example, the word *creativity* can be understood in many different ways and using the term without defining it can lead to misunderstandings or confusion (Mahaux et al., 2012). Table 3 shows whether the reviewed articles categorized trust as either related to digital environments or using a traditional definition.

3.2. Different aspects of trust in the sharing economy

In this section, we consider the second research question. Four different aspects relating to trust emerged from the data during the literature review. These aspects are divided into four different categories based on how the articles dealt with trust among digital platforms. Studies that dealt with more than one aspect of trust were included in more than one category. These categories were 1) how sharing economy platforms support trust-building, 2) the impact of trust on platform usage among users, 3) users' trust in the sharing economy platform or company, and 4) trust as the core of the sharing economy.

3.2.1. How sharing economy platforms support trust-building

This category indicates the factors that affect users' trust, which can be affected by the sharing economy company or platform developer. Of 60 articles, 25 belonged to this category. Among these 25, two clear types of paper were identified: studies that support the use of specific technology solutions for trust-building (Research Question 3) and studies that describe how different solutions affect trust (Table 4).

Table 3
Definitions of trust in the reviewed articles.

No	Article	No definition	Trust in digital environment	Traditional definition of trust
1.	Abrahao et al. (2017)	X		
2.	Abrate and Viglia, 2019	X		
3.	Amirkiaee and Evangelopoulos (2018)		X	
4.	Arteaga-Sánchez et al. (2018)			X
5.	Wang et al. (2019)		X	
6.	Barnes and Mattsson (2016)	X		
7.	Bente et al. (2014)	X		
8.	Bhappu and Schultze (2018)	X		
9.	Bokyeong and Cho (2016)	X		
10.	Brescia (2016)	X		
11.	Chang and Wang (2018)	X		
12.	Chasin et al. (2018)	X		
13.	Cheng et al. (2019)		X	
14.	Constantiou et al. (2017)	X		
15.	Costa et al. (2017)			X
16.	De Rivera et al. (2017)			X
17.	Ert et al. (2016)		X	
18.	Etzioni (2019)			X
19.	Future of Money Research Collaborative		X	
20.	Gleim et al. (2019)			X
21.	Hartl et al. (2016)	X		
22.	Hawliitschek et al. (2018a)			X
23.	Hawliitschek et al. (2018b)	X		
24.	Hira (2017)	X		
25.	Hou (2018)	X		
26.	Kakar et al. (2018)	X		
27.	Kashyap & Bhatia (2018)	X		
28.	Lan et al. (2017)	X		
29.	Lee et al. (2018)		X	
30.	Leung et al. (2019)	X		
31.	Liang et al. (2018)			X
32.	Lub et al. (2016)	X		
33.	Ma et al. (2019)			X
34.	Mikolajewska-Zajac (2018)	X		
35.	Mittendorf (2018)			X
36.	Molz (2013)	X		
37.	Moon et al. (2019)	X		
38.	Pappas (2017)	X		
39.	Puschmann & Alt (2016)	X		
40.	Rekhviashvili & Sgibnev (2018)	X		
41.	Sabitzer et al. (2018)	X		
42.	Ta et al. (2018)	X		
43.	Tauscher & Kietzmann (2017)	X		
44.	Ter Huurne et al., 2018			X
45.	Teubner & Flath (2015)	X		
46.	Teubner et al. (2019)	X		
47.	Thierer et al. (2016)			X
48.	Todoli-Signes (2017)	X		
49.	Tsui (2016)	X		
50.	Tussyadiah & Park (2018)			X
51.	Wang & Jeong (2018)		X	
52.	Wu et al. (2017)		X	
53.	Wu & Shen (2018)	X		
54.	Xie & Mao (2017)		X	
55.	Xie et al. (2019)	X		
56.	Yang et al. (2019)	X		
57.	Ye et al. (2019)			X
58.	Zhang et al. (2018)			X
59.	Zhu et al. (2018)	X		
60.	Zloteanu et al. (2018)			X

Table 4
Articles categorized into two different groups based on their focus on trust-building.

How do sharing economy platforms support trust-building?	
Research findings The research results support the use of a technological solution.	References Cheng et al. (2019); Constantiou et al. (2017); Hou (2018); Future of Money Research Collaborative et al., 2018; Kashyap and Bhatia (2018); Lee et al. (2018); Leung et al. (2019); Molz (2013); Ter Huurne et al., 2018; Wang et al. (2019) Zloteanu et al. (2018)
The research investigates how different solutions affect trust.	Abrahao et al. (2017); Barnes and Mattsson (2016); Bente et al. (2014); Chang and Wang (2018); Ert et al. (2016); Etzioni (2019); Liang et al. (2018); Mikolajewska-Zajac (2018); Puschmann and Alt (2016); Rekhviashvili and Sgibnev (2018); Todoli-Signes (2017); Xie et al. (2019)

3.2.2. Impact of trust among users in the sharing economy

This category includes studies ($n = 18$) that considered trust among users in the sharing economy. This includes aspects that platform developers cannot affect; for example, how user characteristics influence trust. These studies can be divided into three subcategories: those that considered 1) how individuals' usage of the platform affects the extent of people's trust, 2) how individual characteristics influence trust, and 3) how important it is to trust other users within the sharing economy.

Individual usage of the platform can affect the extent of other people's trust. For example, people can improve their social presence in a sharing economy platform, which in turn can enhance others' trust (Ye et al., 2019). Zhang et al. (2018) found that reputation is not as crucial in the sharing economy as it is within traditional e-commerce and that trust can be increased by improving response rates and by decreasing response times. A study by Tussyadiah and Park (2018) notes that the way users portray themselves affects the building of trust. For instance, Airbnb customers considered users who described themselves as well-traveled more trustworthy than those that portrayed themselves in terms of their profession. These studies report that individual behavior can influence how much users trust other users among sharing economy platforms.

Sometimes, individual characteristics such as appearance or culture of origin can have an influence on trust. Even though it may be assumed that trust-building depends on technological solutions and people's use of sharing economy platforms, some factors are beyond users' or developers' control. For example, culture (Chasin et al., 2018) or the interpretation of an individual's trustworthiness based on a photo (Ert et al., 2016) may affect users' decision to trust that person. An interviewee from Brazil in the study by Chasin et al. explained that "trust is the last thing you do" (2018, p. 195).

The last subcategory highlights how vital mutual trust is for users among sharing economy platforms. For example, Hawlitschek et al. (2018b) assert that trust in other users is a crucial prerequisite of platform usage. Trust is a significant factor in individual decision-making regarding repeated use of a sharing economy platform (Arteaga-Sánchez et al., 2018). People's trust is also affected by the trust of others in the platform. If potential users have the impression that others trust a platform, their own trust is enhanced (Teubner et al., 2019). Amirkieae and Evangelopoulos (2018) found that trust is both a matter of grave concern and the most significant factor influencing the decision to use ride-sharing. This finding is supported by Wu et al. who propose that trust is the "strongest factor in Chinese travelers' room-sharing intention" (2017, p. 2702).

3.2.3. Users' trust in a sharing economy platform or company

The articles in this category ($n = 11$) considered users' trust in sharing economy platforms or companies. Institutional trust can lead to trust in the sharing economy (Wu and Shen, 2018). For example, with regard to Airbnb, studies suggest that system quality (Wang et al., 2019) and security and privacy (Yang et al., 2018) strongly influence the formation of trust. Personal qualities such as innovativeness (Wang and Jeong, 2018) seem to affect how trustworthy Airbnb is thought to be. However, there are some contradictory research findings: Liang et al. (2018) suggest that trust in Airbnb did not directly affect trust in an individual host; however, Teubner et al. (2019) propose that trust among users may be enhanced because users trust the platform.

3.2.4. Trust as the core of the sharing economy

Articles in this category were not as consistent as in other categories, as they considered different aspects or perspectives regarding trust as the core of the sharing economy. Nine articles focused on this area. The sharing economy has its origins in distrust

of older more traditional institutions (Lub et al., 2016); thus, trust is essential in this new economic context (Hira, 2017; Leung et al., 2019). For example, Brescia (2016) proposes that the sharing economy would suffer if it were overly regulated. However, the present study found that whilst considering trust as the core of the sharing economy, the articles do not deal with factors that affect trust as such. Instead, they consider why trust is essential to the sharing economy.

There is no single solution to enable trust-building. Thierer et al. (2016) indicate that free competition in the market leads to good solutions. Still, these solutions build trust for the platform, not among users (Thierer et al., 2016). The sharing economy is above all an intermediary: it mitigates risks and builds trust (Constantiou et al., 2017). Part of the business model of the sharing economy is to keep prices low, and to do this platforms usually do not offer formal training for service providers, which can lead to a low level of quality control for services (Tauscher and Kietzmann, 2017). Chasin et al. (2018) propose that because sharing economy platforms have weak control over their quality of service, trust and safety are consequently the reasons for their failure. On the contrary, Tsui (2016) asserts that trust is not the cause of business failure. It seems that the research is unanimous about the importance of trust in the sharing economy, but the degree to which it affects the success of a platform remains unclear.

3.3. Different technology solutions to build trust in the sharing economy

Based on our review, we found 28 technological solutions thought to build users' trust in sharing economy platforms (or other users), as presented in Table 5. Reputation systems were one of the most studied trust-building solutions. Abrahao et al. (2017) suggest that they can reduce the impact of social bias, for example, through trust in others who are similar (homophily). A study by Rekhiviasvili and Sgibnev (2018) seems to support this: they did not study reputation systems as such but found that technological solutions can compensate for interpersonal trust. Hou (2018) noticed that reputation systems help to build trust between strangers, and the Future of Money Research Collaborative et al. (2018) asserts that reputation has the most powerful impact on users' trust. Reputation not only builds trust but also seems to have a positive effect on sales and prices (Ter Huurne et al., 2018). Based on these studies, we can conclude that the use of reputation systems for trust-building among sharing economy platforms is both justified and a good choice; however, these systems are sensitive to small variations. For example, Bente et al. (2014) propose that the difference between three and four stars (rating) is enough to increase sales.

As for the question of how technological solutions should be used to best support trust-building, the answer is not so coherent. For example, a study by Zloteanu et al. (2018) suggests that user judgment can be affected by seeing at least three pieces of information relating to trust and reputation; however, it is unaffected by seeing any additional pieces. In turn, Ert et al. (2016) propose that users will use any information they can to make a decision; however, they are unclear about how much trust and reputation information users need to make their decision to trust.

Platforms may integrate with social media (Barnes and Mattsson, 2016). However, they should still maintain their trust and reputation systems because it may be best that trust and reputation information is produced "locally" within the platform (Zloteanu et al., 2018). Thus, it may be that integration with social media should be carefully considered, as it remains unclear whether social media integration supports trust-building among sharing economy platforms. Furthermore, it seems reasonable that

Table 5
Technological solutions for building trust. 28 solutions were found from the literature review how trust can be supported in the sharing economy.

Technological solution	References
Background check	Amirkiaee and Evangelopoulos (2018); Etzioni (2019); Thierer et al. (2016); Xie et al. (2019)
Back-up insurance	Hawliitschek et al. (2018b); Puschmann and Alt (2016); Zhu et al. (2018)
Big data analytics	Thierer et al. (2016)
Communication through the platform	Bhappu and Schultze (2018); Thierer et al. (2016)
Credit-scoring system for users' self-regulation	Lan et al. (2017)
Driver's and passengers' dynamic information (location & time)	Zhu et al. (2018)
Filter for unqualified drivers	Zhu et al. (2018)
Friend link	Molz (2013)
Identity verification	De Rivera et al. (2017); Etzioni (2019); Zhu et al. (2018); Zloteanu et al. (2018); Xie et al. (2019)
Informing your friends/family of the car number	Kashyap & Bhatia (2018)
Integration with social media	Barnes and Mattsson (2016); Lee et al. (2018)
Laws and regulations	Bokyeong & Cho (2016)
Number of followers	Hou (2018)
Number of reviews	Abraham et al. (2017); Hou (2018); Zloteanu et al. (2018)
Photos	De Rivera et al. (2017); Hawliitschek et al. (2018b); Molz (2013); Xie et al. (2019); Zhang et al. (2018)
Profiles/personal information	Bhappu and Schultze (2018); De Rivera et al. (2017); Hawliitschek et al. (2018b); Molz (2013); Ta et al. (2018); Thierer et al. (2016); Tussyadiah and Park (2018); Zhang et al. (2018); Zhu et al. (2018)
Rating systems	Abraham et al. (2017); Amirkiaee and Evangelopoulos (2018); Barnes and Mattsson (2016); De Rivera et al. (2017); Etzioni (2019); Future of Money Research Collaborative et al., 2018; Hawliitschek et al. (2018b); Hira (2017); Hou (2018); Lee et al. (2018); Thierer et al. (2016); Tsui (2016); Xie et al. (2019); Zhu et al. (2018); Zloteanu et al. (2018); Lan et al. (2017)
Reporting of other users' violations of the rules	Lan et al. (2017)
Reputation systems	Abraham et al. (2017); Bente et al. (2014); Cheng et al. (2019); Costa et al. (2017); Ert et al. (2016); Hou (2018); Mikolajewska-Zajac (2018); Molz (2013); Ter Huurne et al., 2018; Thierer et al. (2016); Zloteanu et al. (2018)
Reviews	Amirkiaee and Evangelopoulos (2018); Chang and Wang (2018); De Rivera et al. (2017); Hawliitschek et al. (2018b); Kakar et al. (2018); Thierer et al. (2016); Xie et al. (2019); Yang et al., 2018; Zloteanu et al. (2018)
Rules and standards	Constantiou et al. (2017); Wu et al. (2017)
Search function	Gleim et al. (2019)
Secure payment systems	Barnes and Mattsson (2016); Hawliitschek et al. (2018b); Thierer et al. (2016)
Seller information	Kakar et al. (2018)
Superhost badge	Xie & Mao (2017)
Time of departure (Uber & Ola)	Kashyap & Bhatia (2018)
Tracking feature (Uber & Ola)	Kashyap & Bhatia (2018)
Vouching	Molz (2013)

information should be generated locally within platforms; otherwise, the purpose of the platforms and their trust systems could result differently making them difficult to compare.

3.4. Evaluating trust in the sharing economy

The sharing economy cannot reach its potential without trust. Trust in other users can predict platform usage (Hawliitschek et al., 2018b), is essential for repeated use of the platform (Arteaga-Sánchez et al., 2018), and is a crucial factor affecting the decision to use, for example, ride-sharing (Amirkiaee and Evangelopoulos, 2018). This is why platform developers and companies could use the easy-to-use tool for evaluating user trust. The sharing economy

includes for-profit and non-profit organizations, of which non-profit organizations have less money for developing the platform. A lightweight solution could serve such organizations in particular.

Based on this comprehensive literature review and its findings, we created a preliminary model (Fig. 1) for evaluating users' trust in the sharing economy platform.

We aimed to create a tool for sharing economy platform developers/management to use for evaluating user trust. In this paper, we describe our preliminary model from that tool. It has not yet been tested, and its development continues with design science research. We encourage the rest of the academic community to evaluate, test, and further develop this model. We plan to conduct design science research from this subsequently.

The tool consists of four sections: 1) platforms' solutions to support the trust of the users, 2) trust and interaction between users, 3) users trust for the platform, and 4) users trust for the company/organization. Evaluation occurs with a sliding scale from the center towards the corners. The closer to the center, the less the aspect has been considered within the platform. Measurement can be conducted in practice, for example, with a radar chart (Fig. 2) using a scale of 0–5 (where 0 is the aspect that has not been considered at all and five means the element has been considered well). The tool is intended for evaluating user trust in the sharing economy platform and to identify problem areas in relation to trust. If platform developers or managers recognize areas where user trust is not well supported, they can make improvements accordingly.

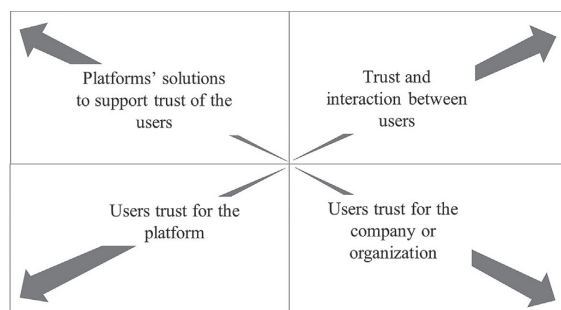


Fig. 1. Preliminary model for evaluating users' trust in the sharing economy platform.

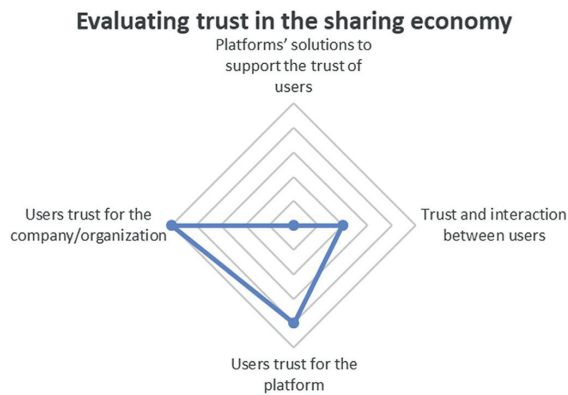


Fig. 2. Example of radar chart based on the preliminary model.

4. Discussion, future research directions, and limitations

4.1. Discussion and suggestions for further research

The sharing economy is forecast to grow significantly (Statista, 2019), and might offer a significant answer to sustainability challenges (Cherry and Pidgeon, 2018). Moreover, trust plays an essential role in the sharing economy (Future of Money Research Collaborative et al., 2018); therefore, it is crucial to understand it better. We used a systematic literature review to examine the following research questions: 1) How trust is defined in the research? 2) Which aspects of trust within the sharing economy have been studied? 3) Which technology solutions have been employed within the sharing economy? and 4) How can trust in the sharing economy be evaluated? By answering these questions, we learned which essential aspects should be further studied in the future, what should be considered by individuals when trusting others in sharing economy platforms, and what should be taken into account when developing new platforms for the sharing economy.

We identified deficiencies in the definition of the term *trust* in the reviewed articles. Only half ($n = 36$) of the studies reviewed provided a definition of the concept of trust. This was a somewhat worrisome finding, as it is challenging to investigate the matter with only vague definitions (or no definition at all) for the central term. We recommend that researchers consider which terms require definition, or if the terms are so well-known and universally understood that they can be left without a definition. It would also be wise to review the definition of key terms occasionally, as if an author does not define terms that are ambiguous or difficult to understand, this could lead to difficulties in their comprehension and usage. For example, if we do not know how a researcher has understood a term, it may then be difficult to review the study and compare with similar studies. It should also be noted that research on trust in the sharing economy is multidisciplinary, and, in some fields its application is not particularly intuitive, or the nomenclature of their field is used. We conclude that defining the meaning of *trust* explicitly is essential to avoid misunderstandings. We hope that these findings will inspire researchers to consider how to define trust in future studies.

We also identified that the term *sharing economy* is understood in slightly different ways. It has synonyms and subsets—for example, gig economy, peer-to-peer economy, and on-demand economy (Hou, 2018; Ertz and Leblanc-Proulx, 2018; Future of Money Research Collaborative et al., 2018; Martin, 2016; Tsui,

2016)—whose relationships and usage are unclear. The use of these and related terms should be researched and clarified in future. Different fields of study use different terms, which can influence the research framed (Sakao and Brambila-Macias, 2018). If there are no common terms between research fields, it may be hard to create shared knowledge beyond specific research fields. For example, Sakao and Brambila-Macias (2018) argue that the quality of environmental sustainability will benefit from transdisciplinary research.

Personal characteristics (for example, personal innovativeness; see Wang and Jeong, 2018) and behaviors (for example, how users portray themselves in a platform; see Tussyadiah and Park, 2018) influence how trustworthy individuals are seen to be within sharing economy platforms. Neither of these has been researched in sufficient depth. For instance, there is a lack of studies focusing on individual social skills and their effect on perceived trustworthiness. For example, digital platforms may discriminate people based on their social skills. Thus, platforms should be developed so that such social bias can be reduced. We already know that individual behavior can either enhance or diminish trust in sharing economy platforms. However, it remains unclear how easily people are able to manipulate other people's beliefs and create trust under false pretenses. It might be possible to prevent this via specific technological solutions. This would increase equality and support the social dimension of sustainability. Social bias in sharing economy platforms may lead to inequality: personal characteristics and behavior may affect the extent to which individuals can benefit from the sharing economy. Thus, it seems that the sharing economy may impact the social dimension of sustainability in particular. Transparency is often greater in the sharing economy when information is provided not only by the service provider but also by users.

Based on this review, there seems to be a shared understanding that trust is the core of the sharing economy, as without trust, there is no sharing. However, the degree to which sharing economy companies take trust into account in their business strategy and their values remains unclear. For instance, whether sharing economy companies understand the importance of trust and how much users' trust affects their success are essential aspects to explore in future studies. Furthermore, we found evidence that user trust in a company can lead users to trust other users (Teubner et al., 2019). Trust among users may have a positive impact on platform usage, and in turn, a positive impact on the success of the platform. This exciting aspect seems to require more attention and studies to refine the contradictory findings related to its importance to companies' performance. For example, Chasin et al. (2018) suggest that "trust and safety are ... reasons for failures of sharing economy [companies]," while conversely, Tsui (2016) suggests a lack of trust does not seem to be the reason why some sharing economy companies end up failing.

Sharing economy businesses do not always exist in a conducive political environment (see, e.g., Zhu et al., 2018, regarding the Didi ride-hailing platform). For instance, laws and regulations vary from country to country, and regulations can sometimes change at a fast pace—particularly the case for international or global companies, as this may hinder the expansion of a business. Research is therefore required that accounts for and describes the environment in which the sharing economy company operates. For example, geographical area, laws, regulations, and culture should be considered as they can significantly influence the success (or otherwise) of a business.

Large, global companies like Airbnb and Uber have been studied extensively, and these studies have provided a great deal of information on trust-building in the sharing economy. However, their large size may lead to a distorted picture of the sharing economy

when considering smaller firms and start-ups. In addition, most of these studies have focused on commercial platforms, whereas there seems to be a lack of studies on trust-building within non-commercial operations. Non-commercial and smaller sharing economy platforms could be studied in the future, as their business models and impact of trust on such businesses might differ considerably. We also perceive a need for comparative studies between the sharing economy and traditional business to examine the extent to which technological solutions, personal characteristics, and personal behavior affect trust-building within these two different business models. We further noticed that some researchers (see [Martin et al., 2017](#)) say that the sharing economy seems more sustainable than traditional businesses. Still, we did not encounter sufficient evidence to support this.

Furthermore, we found that information sharing is an integral part of the sharing economy; however, it is barely addressed in existing studies. A variety of platforms could be taken as a research sample to obtain the broadest possible picture. Other solutions could be to study different kinds of sharing economy platforms separately, and then combine and compare information from these studies with the help of a systematic literature review to gain a broader perspective on the platforms.

In this study, we identified 28 different technological solutions for supporting trust-building among sharing economy platforms. Many studies supported the use of reputation systems, rating systems, and reviews, but it would be essential to assess which technology solutions are optimal for building trust. The fact that some technological solutions have been used or researched less does not necessarily mean that they are less effective. In addition, there is conflicting information on the optimal number of technological solutions to use. This would be worth researching further, as it is not always economically viable to use multiple solutions. This would help sharing economy companies to be more sustainable by not using funds for something they do not need.

A major research topic for the future is to evaluate the impact of the sharing economy on different dimensions of sustainable development, for example see [Martin et al. \(2017\)](#), [Schor \(2016\)](#), and [Zervas et al. \(2017\)](#). There might be a negative environmental impact when sharing economy services are added to traditional products. One example of this is how IKEA in London uses the TaskRabbit sharing economy platform to help customers with product assembly; in this way, they aim to sell more products. However, evaluating the sustainability of the sharing economy is not a simple task. It also has many positive effects; for example, it can increase social connections and employment options ([Ciulli and Kolk, 2019](#)). Because the sharing economy is a diverse group of platforms, one way to understand its impact on sustainability could be to view one platform from several different perspectives, such as environmental, economic, social, and cultural points of view. Subsequently, it might be easier to understand how to research the sustainability of the sharing economy on a larger scale.

In our literature review, we noted the relatively recent publication of most of the articles. The boundaries of the sharing economy are difficult to draw, and it is still uncertain what economic, ecological, and social impacts the sharing economy will have ([Netter et al., 2019](#)). We do not know enough about the sharing economy yet, and questions concerning its content, its effect on sustainability (economic, ecological, social, and cultural aspects), and how can we support its sustainable aspects are still mostly unanswered or need clarification.

4.2. Implications for theory and practice

As [Bocken et al. \(2014, p. 42\)](#) write: "A holistic approach is required to tackle the challenges of a sustainable future: responses

to environmental changes will necessarily need to be in parallel with economic and social change." The sharing economy can include environmental, economic, and social aspects of sustainability. In addition, [Cherry and Pidgeon \(2018\)](#) suggest that tackling trust issues should be noted when designing sharing economy concepts and delivery. The sharing economy struggles to find the optimal balance between security, trust, and ease of use. Safety- and trust-related solutions may complicate the use of the assets; whilst at the same time, ease of use is essential, so we should try to understand more about trust-building. This paper presents what we have identified relating to trust in the context of sharing economy.

Trust is a remarkable reason why sharing economy platforms fail ([Chasin et al., 2018](#)). Based on this literature review, we developed a preliminary model to evaluate the trust of users. This model could especially help small and non-profit sharing economy platforms. For example, [Martin et al. \(2017\)](#) propose that local sharing economy platforms can be more sustainable than traditional businesses. By supporting the development of local, small, and non-profit sharing economy, we can promote sustainability.

4.3. Limitations

As [Kitchenham et al. \(2010, p. 804\)](#) note regarding systematic literature reviews, "one of the major problems ... is finding all the relevant studies." This literature review is no exception, and it should be noted that there might be relevant studies that we did not find in our search. In addition, how we chose our keywords affected the results. Our exclusion criteria might be too limiting, since we excluded conference papers. However, even though this is a limitation, we feel the validity of the study was increased as it can be challenging to evaluate the quality of conferences. Furthermore, in this paper we created a theoretical model of how trust can be assessed in the sharing economy; unfortunately, the model has not yet been tested in practice and requires further empirical validation. In principle, the model is suitable for both research and the development of platforms.

The trust research domain is not familiar with the authors. Authors have studied trust before from the perspective of information systems. In this systematic literature review, the field of study was not fixed to only one research field. This can either be a positive feature (for breadth of focus) or conversely it can lead to a fragmented view. This possible limitation should be noted, but the authors still believe that there is a need for this type of research.

5. Summary and conclusions

Trust in the sharing economy has been studied from different perspectives. In this paper, the reviewed studies were divided into four categories: 1) how sharing economy platforms support trust-building, 2) the impact of trust between users on platform usage, 3) users' trust for the sharing economy, and 4) trust as the core of the sharing economy. From the review, 28 technology solutions to build trust were gleaned. Reputation systems, ratings, and reviews were the most used technological solutions for this purpose. Of the 60 papers studied, 24 defined trust, 15 defined it traditionally, and 9 studies defined trust in the digital environment in particular. Of the total of 60 papers, 36 did not define trust at all.

Trust in the sharing economy is a current research topic, and most of the studies were written in recent years. It is a critical research topic, because in the future, the sharing economy could be one way to support sustainability. Trust in the sharing economy should be studied further; for example, non-commercial platforms in the sharing economy have not been studied enough to obtain a clear picture. Many technological solutions have been recognized,

but their roles are not yet clear. For example, it is not known how many of these platform developers should be used and which ones are optimal for trust-building in the sharing economy platform without endangering users.

The result of this systematic literature review is a theoretical model of how trust can be evaluated in the sharing economy. Additionally, we assembled useful tables for researchers and practitioners. For example, both practitioners and researchers can use Table 5, which presents a list of technological solutions for trust-building in the sharing economy. We have systematically summarized the last five years of relevant literature and condensed the main notes and conclusions in tabular form. We assume that this review will help other researchers in studying trust issues related to the sharing economy.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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IV

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