ABSTRACT

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Author(s)	Johannes Matintupa	Student number	513738
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Title	Small and medium-sized (SME) companies are not investing in digital tools and IT – why? A research into SME digital tools and IT adoption factors		
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Prior research and media coverage over recent years have stated that small – and medium-sized companies (SMEs) are lagging behind in digitalisation and the adoption of digital tools and IT. This master thesis research studies SME IT adoption factors with research question; What are the IT and digital tools adoption affecting factors in SME environment? The master thesis examines different models, solutions and outsourced IT consultancy available for SME companies to use in gaining understanding on their business.

Research builds on existing background literature on the topic and based on prior literature found factors, two empirical studies are conducted; a theme based focus interview of IT service providers, and, a data analysis of available data on SME companies research. The research discovers whether same IT adoption factors found from literature are found from SME companies functioning in Turku and recommendations are given to IT specialists working in the field.

Results show SME IT adoption taking place under various affecting factors and the environment SMEs function in is changing rapidly. Key findings describe SME business without long term strategies and characterised by limited resources of time, financials and expertise which cause uncertainties and negative attitudes towards IT investments. The available IT solutions are many times perceived as not beneficial, too complex to use or taking too much resources. Relations between SME companies and outsourced IT companies require trust and transparency in order to work. Conclusions state that SMEs need to put efforts in understanding their business processes in order to improving their business. This understanding enables correct IT solution selection. SMEs need to invest in internal capabilities and external relationships. IT service providers have a key role in supporting SME digitalisation. They need to act transparently and foster trust, and the changing ways of doing business puts requirements on IT companies to renew their structures as well. IT companies have a key role in enabling well-argued SME IT decision-making which makes sense to the SME company owners or decision-makers.

Key words	Small – and medium-sized companies, IT adoption, IT adoption barriers, digitalisation
Further information	

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TIIVISTELMÄ

X	Pro gradu -tutkielma
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Otsikko	Pienet ja keskisuuret yritykset (Pk) eivät investoi digitaalisiin työkaluihin ja IT-ratkaisuihin – Miksi? Tutkimus Pk-yritysten IT-ratkaisujen käyttöönottoon vaikuttavista tekijöistä		
Ohjaaja(t)	Jani Koskinen, Antti Tuomisto		

Aiemman tutkimuksen ja mediassa kerrotun tiedon mukaan pienet ja keskisuuret yritykset ovat jääneet digitalisaatiossa ja IT-käyttöönotossa. Tämän pro gradu tutkimuksen aiheena on tutkia IT-käyttöönottoon vaikuttavia tekijöitä Pk-yrityssektorilla. Tutkimuskysymys on: Mitkä ovat IT-työkalujen käyttöönottoon vaikuttavat tekijät Pk-yritysten toimintaympäristössä? Tämä pro gradu pohtii erilaisia malleja, ratkaisuja ja ulkoistettua IT konsultointia, jotka ovat Pk-yritysten saatavilla ja joita nämä voivat käyttää liiketoimintaymmärryksen tuottamiseen ja hyödyntämiseen.

Tutkimus rakentuu taustakirjallisuuteen aiheesta, jonka kautta löydettyjen tekijöiden pohjalta kaksi empiiristä tutkimusta on suoritettu; teemahaastattelu IT palvelutuottajille ja data-analyysi saatavilla olevasta Pk-yritysten tutkimuksesta. Tutkimus selvittää löytyvätkö taustakirjallisuudesta esiin nousevat IT käyttöönottoon vaikuttavat tekijät Turussa toimivista Pk-yrityksistä. Tutkimuksen pohjalta alalla toimiville IT ammattilaisille annetaan toimintasuosituksia.

Tulokset kertovat, että Pk-yritysten IT-käyttöönottoon vaikuttaa monet tekjät ja että Pk-yritysten toimintaympäristö on nopeasti muuttuva. Keskeisimmät löydökset kuvaavat Pk-yritysten liiketoiminnan etenevän ilman pitkälle ajanjaksolle suunniteltuja strategioita ja että toimintaa kuvaa rajalliset resurssit koskien käytössä olevaa aikaa, rahoitusta ja osaamista, jotka johtavat epävarmuuteen ja negatiivisiin asenteisiin suhteessa IT investointeihin. Saatavilla olevat IT työkalut ja ratkaisut nähdään usein ei-hyödyllisinä, liian hankalina käyttää ja resursseja vievinä. Ulkoistetut suhteet vaativat luottamusta ja läpinäkyvyyttä toimiakseen. Johtopäätökset kertovat, että Pk-yritysten tulee investoida ymmärryksen kehittämiseen, jotta nämä voivat kehittää liiketoimintaansa. Tämä ymmärrys mahdollistaa myös oikeiden IT-ratkaisujen valinnan. Pk-yritysten tulee investoida myös sisäiseen osaamiseen ja ulkoisiin suhteisiin. IT paveluntarjoajat ovat avainasemassa Pk-sektorin digitalisaation nostamisessa. Näiden pitää toimia läpinäyvästi ja luottamusta ylläpitävästi. Niiden tulee ottaa myös huomioon liiketoiminnan muuttuvat työtavat ja uudistaa omia rakenteitaan näitä vastaaviksi. Ulkoistetuilla IT-yrityksillä on avainrooli Pk-yritysten päätöksenteon tukijana.

Asiasanat	pienet – ja keskisuuret yritykset, IT käyttöönotto, digitalisaatio, IT käyttöönoton esteet
Muita tietoja	

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SMALL AND MEDIUM-SIZED (SME) COMPANIES ARE NOT INVESTING IN DIGITAL TOOLS AND IT – WHY?

A research into SME digital tools and IT adoption factors

Master´s Thesis
in Information Systems Science
(Master Degree Programme in
Global IT Management, GITM)

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1 INTRODUCTION

In recent decades we have seen a tremendous change in the way people interact with each other. Digital devices and tools have provided us all multiple ways to interact and how to do work. Companies are turning to work methodologies utilizing digital tools and information technology (IT) in search of efficiency, new value chains and ways of work. Digitalisation is one of the terms used to describe the change towards using these devices, tools and work methodologies.

Most of the companies (99 %) functioning in Finland and in Europe are small and medium-sized (SME) companies employing less than 250 persons (European Commission, 2017a,). In past decades companies of all sizes have turned their business functions and processes to be handled digitally and/or with IT solutions freeing businesses to enjoy the benefits of digitalisation. The turn to using digital tools can be even more impactful for SMEs because their small structure enables among others faster communication between companies, suppliers and customers, quick decision-times, fast implementation times. These factors are also known as factors of competitive advantage which companies should strive for. (Deros, Yusof & Salleh 2006.)

SMEs in Finland and in European Union (EU) have a sizeable impact on gross domestic product (GPD). EU Annual Report on European SMEs 2015/2016 reported that SME companies in the non-financial sector make up 99.8 % of all enterprises and 66.8 % of employment (European Commission 2017b). According to 2015 estimation, SMEs employed 935 645 persons in Finland making up 64.6 % of all persons in the work force (European Commission 2016).

There are many different definitions on SME companies. One widely accepted definition comes from the European Commission (European Commission 2017a) which is also used within this master thesis work;

- Micro companies have less than 10 employees, and less than 2 million euro turnover
- Small companies have less than 50 employees, and less than 10 million euro turnover
- Medium-sized companies have less than 250 employees, and less than 50 million euro turnover.

Although advantageous, recent media coverage on ‘digitalisation’ has shown that many companies still have challenges with taking the full advantages of digitalisation. A research in Finland (Suomen Yrittäjät 2017) concluded that only 12 % of Finnish SME companies think that digital environment is crucial to their business, and that 35 % of the companies are at the lowest level of digitalisation, ‘the digital dropouts’, on a four-scale rank. Microsoft (2017) study revealed same direction results stating that Finnish SME companies are cautious in making decisions on technology investments.

In discussion of the research results above the question why Finnish SMEs are not investing in IT or digital tools was raised. According to Tomi Kasurinen, (Kauppalehti, 2017), the benefits of digitalisation need to be identified and stated in an understandable way to SME company decision-makers. The challenge is that companies and their representatives need a lifestyle change in the ways companies are managed. Management should perceive its function as providing meaning and internal motivation to work in co-operative way by building trust, enthusiasm and passion which would ensure the continuance of growth.

Companies not turning to digital tools, methodologies or ways of working is not only a problem faced in Finland. Boston Consulting Group (BCG 2017) identified a wide gap between companies and organizations who are gaining high scores in digitalisation evaluations and the ones who are lagging behind. Their results state that 25 % of the companies are at risk of missing digitalisation in total.

EU (European Commission, 2017c) has also recognized digitalisation challenges in business and has made investments in creating possibilities for SMEs to digitalise their business and strives for ensuring adequate IT infrastructure and legislation for SME growth. This work is done with strategies such as the EU wide single market area aiming at reducing regulation to boost e-commerce and by redefining copyright laws (European Commission 2018a). Initiatives like the INTERREG EUROPE programme aims at identification and dissemination of best practices for enabling growth and employment creation (Interreg Europe, 2015).

EU also supports regional development in digitalisation through different funding mechanisms and instruments. EU's main instrument for supporting jobs, better employment and ensuring fairer job opportunities is the European Social Fund (ESF). Regarding SME digitalisation, its one priority is to boost the adaptability of workers with new skills and through lifelong learning, and companies with new ways of working. (European Commission 2018b.)

Among many other funding forms, the ESF funds regional research projects in academia and the author of this master thesis is a working member in such a research project. The aim of the research project is to develop SME company digitalisation knowledge and to enable SME understanding on how to control and manage 'the digital world'.

It can be stated that SME business sector needs support in IT adoption and in its strives for digitalisation. Although EU and other entities strive on many fronts to enable new legislation and to create infrastructure for all companies to digitalize themselves, there are, however, many factors affecting the adoption of IT, information and communication technologies (ICT) and digital tools on the ground level; in the SME companies' daily (work) lives. This master thesis takes a look at these daily lives of SMEs and aims at identifying factors affecting digital tools and IT adoption, and IT related decision-making. The viewpoint taken is to reveal these factors and aid IT professionals working with SME

companies or persons in charge of IT in SME companies to make digitalisation related decisions and/or to take use of digitalisation more effectively. The research question of this master thesis thus is;

'What are the IT and digital tools adoption affecting factors in SME environment?'

There are a vast number of solutions available for companies to create or generate understanding on their business environment. Maturity models, tools and frameworks are used in variety of companies to indicate the current level of business and IT. Maturity models and other tools provide companies with stages or phases and by following the requirements and sequence of each stage or phase companies can elevate to a higher maturity level (Röglinger, Pöppelbuß & Becker, 2012). The reason for the use of tools and for example frameworks is, among many, to illustrate an overview and communicate a new vision to the organisation. The target of using these solutions can also be to give insights into SME companies' strengths and weaknesses, and, through detailed information, they can support and improve the chance of success of IT projects. (Deros et al. 2006.)

Although different solutions exist, the problem with many of them is that they require SMEs to put efforts in finding information and IT knowledge on selected tool usage. Additionally, SME companies do not have time or other resources available to them to put on this task. For this reason many companies turn to IT outsourcing which, according to Karjaluoto and Huhtamäki (2010), has the potential of lowering SME company IT adoption barriers.

Outsourcing can lead to achieving competitive advantage by outsourced consultant or service vendor bringing IT knowledge to companies (Aiello, Dulskja, Ferri, Gatti, Menshikova & Zitelli 2016). However, outsourcing can also bring forth different adoption barriers which are related to the relationships companies have with outsourced entities. These include among others contractual issues, trust and reputation (*see*: Devos, Van Landeghem & Deschoolmeester 2012; Habib, Ries & Muhlhauser 2010; Wang & Vassileva 2003.)

As seen above, SME companies have difficulties with adopting IT and digital solutions, and thus, there is a need to investigate and research this topic. The vast number of scientific research already done on the topic needs to be acknowledged and that there exists many solution proposals to overcome IT adoption barriers. However, in the spirit of regions supporting countries and countries supporting larger EU area, this research is conducted to generate more insight to the issue. This research is conducted in and with companies in Turku region, Finland. Although the results of this research cannot be expanded to cover wide range of SME companies in different countries and cultures, it can provide meaningful information and regional comparison with literature found issues.

The research question is answered through selected background literature on the topic aiming at identifying the key factors affecting digitalisation and IT adoption in SME companies. The literature found factors are compared against research results found by two conducted studies; analysing data on SMEs provided by an EU funded research project where an action research was conducted, and by an interview study to IT service providers and vendors which have SME companies as customers. This two-folded research has the aim of providing concrete and wholesome information which describes the daily life of SMEs in relation to their IT and digitalisation efforts.

This master thesis produces also a short and practical list of suggestions to enable IT professionals, either working as IT consultants to SME companies or as SME company IT specialists, to tackle the most common IT adoption and decision-making barriers. The list will gather the findings of this research to aid companies in understanding factors affecting SME IT and digitalisation adoption, the uncertainties and possibilities.

1.1 Structure of thesis

Following chapter 2 takes a look at background issues of the thesis and among others, digitalisation is described in more detail from various viewpoints. The term 'digitalisation' and its use and definition within this master thesis research is built through terms digitalisation, digitization and digital transformation. Chapter 3 will describe the factors relating to SME decision-making and decision-making regarding IT adoption. This is done using researched literature on digitalisation and IT adoption in SMEs. The chapter will look at barriers and enablers affecting IT decision-making and uncertainties SME entrepreneurs, chief executive officers face.

Chapter 4 presents concepts of human and social capital to which knowledge, outsourcing and networking, and trust belong to. Chapter 5 presents tools, frameworks and maturity models aimed at helping SME companies reveal their current state in IT and in business in general.

Chapter 6 presents the research methodology of grounded theory and the methodologies chosen for collecting empirical evidence. This research is a two-part empirical research including an semi-structured focus interview study with six (6) IT companies functioning in Turku region providing and performing IT services to SME companies. The second study is an analysis data concerning six (6) SME companies provided by an action research conducted and collected by Turku University Work Informatics research team while working with SME companies in a research project.

Research results are presented in chapter 7, and in chapter 8 the interview responses are reviewed against the literature review, and the relevant evaluations and findings rising

from the analysis of the SME company cases. Chapter 9 provides the reader with conclusions and a list of suggestions or tips for the IT specialists use; what to consider when dealing with micro- or small-sized companies endeavouring in digitalisation and/or IT. A list of references used in this research work is provided at the end of the research.

1.2 Notions on SME entrepreneurship

Two notions need to be made about SME entrepreneurship and entrepreneurship in general. First is the cultural differences on defining and affecting entrepreneurship. For instance, Hofstede, Noorderhaven, Thurik, Uhlaner, Alexander, Wennekers and Wildeman (2004) state that entrepreneurship flourishes better in countries which have more entrepreneurs, and that society's values towards entrepreneurship play a huge role on whether people turn to entrepreneurship.

Stephan and Uhlaner (2010) researched on cultural descriptive norms affecting entrepreneurship and concluded that the phenomena of entrepreneurship is not solely relying on individualism and self-interest. They conclude that it is an activity embedded in social context, and that cultures rich in social capital which does not promote individualistic performance are more optimal for entrepreneurship.

Culture also affects IT adoption. For example, Middleton and Byus (2011) found that cultural minority SME companies in USA were less likely to adopt a wide range of ICT technologies than other SMEs. On the other hand, when work cultures are mixed establishing diverse work environments, according to Nathan and Lee (2013), firms are more prone to developing major new products and innovation. Bearing this in mind, it needs to be stated that this master thesis does not try to identify or resolve IT adoption barriers on a world-wide scale but aims at revealing regional factors and their links with research literature.

The second notion is on solo entrepreneurship which is a type of business where one person chooses to go into business for him/herself and does business through collaborations, by most likely, without employees (Solo-E 2018). In comparison with later literature review on networks, solo entrepreneurs have more narrow human capital 'array' than teams (Ucbasaran, Lockett, Wright & Westhead 2003). This results in them relying more on personal experience and knowledge whereas networks are recognizing opportunities by a fold (Wasdani & Mathew 2014).

Throughout this master thesis, discussion and research is on SME companies and IT and digitalisation adoption factors affecting them. Solo entrepreneurship is worth notion of as we need to remember that, although in this research one definition on SMEs is obtained, the true definition of SMEs entail many different forms of entrepreneurship and performing business. Differences remain and are worth their own research.

2 BACKGROUND

2.1 EU supporting digitalisation

EU has recognized the importance, meaning and potential of digitalisation together with the fact that SME companies are not investing or adopting digital tools and IT enough. European Commission states (European Commission 2018b) that SME companies are lagging behind in digital development compared to other parts of the world and that there are many differences in digitalisation between regions in EU. To unifying regional differences and in order to support digitalisation, EU (European commission 2018a) has made digitalisation a priority and launched initiatives aiming at creating EU wide digital single market. EU's aim is to reduce regulation and join EU country national markets into a single one with objectives to, among many, boost e-commerce by removing geoblocking, modernising copyright laws and audiovisual rules, and by improving ePrivacy rules to digital environments.

According to European Commission factsheet (European Commission, 2017d), EU wide fully operational Digital Single Market could contribute 415 billion euros per year to EU economy and create hundreds of thousands of new jobs. Figure 1 below shows European Commission timeline for Digital Single Market development.

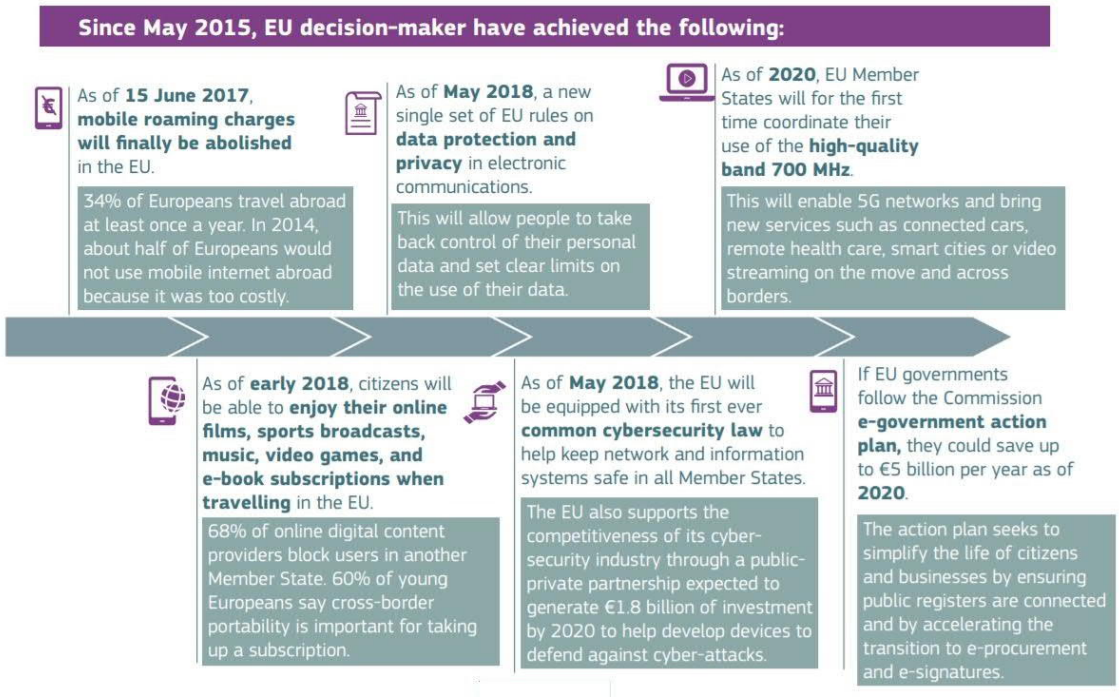

Figure 1. European Commission Digital Single Market development timeline. (European Commission 2017d.)

Timeline above presents EUs recent and forthcoming strives for enabling digitalisation according to which, at the time of this master thesis writing, the next upcoming phase is the much discussed GDPR (General Data Protection Regulation) which aims at new privacy regulation. It also shows the three future phases of EU Digital Single Market strategy aiming at diminishing regulation and enabling EU wide business.

EU does a lot of work on creating infrastructure and regulation to support digitalisation but there is also vast amount of work EU conducts on other fronts which are important for enabling digitalisation. For instance, one instrument for implementing EU's cohesion policy is Interreg Europe programme which aims at and promotes identification and dissemination of best practices for enabling growth and employment creation (Interreg Europe, 2015) and focuses on SME competitiveness (Interreg Europe, 2018). In regards to creating best practises, EU wants regions to develop and share them. This work is supported and enabled through funding digitalisation related job and work development and the main funding instrument for this is the European Social Fund (ESF). (European Commission 2018b.)

Sustainable Growth and Jobs 2014-2020 structural fund is one regional fund within ESF which aims at transnational cooperation. The fund recognizes that company growth is needed which can be achieved through developing workforce skills and supporting internationalisation. According to the fund scheme documentation workforce skills development is supported by keeping the workforce educated and trained throughout their careers and by professional development plans and methodologies. Internationalisation can be achieved with new products and services which enables and makes intelligent specialization possible. New technologies (use of digital tools) and innovation also supports SME companies to realize competitive advantages. (Rakennerahastot 2014.)

EU supporting workforce education and skills development is a key antecedent to sustainable economic development researched for example by instance Martin, Ciovica and Cristescu (2013). As seen by above, EU has been making multiple efforts to enable companies to take action on digitalisation. Digitalisation, however, can be defined as a leviathan of terms which incorporates multiple bearings depending on viewpoint and the source describing it. Interreg Europe programme defines digitalisation as the process of technologically-induced change within all kinds of industries (Interreg Europe 2017).

2.2 Digitalisation = digitalisation + digitization + digital transformation

In literature digitalisation is many times explained through three concepts; digitalisation, digitization and digital transformation which mainly talk about the same phenomena but

from different viewpoints. The three concepts are presented below drawing up to a conclusion on how digitalisation is understood and used within the context of this master thesis research. In common terms and language digitalisation, or digitalization, can be understood as turning something to be used by or via digital tools, systems or software. However, the term is still today without a general definition. In literature different authors and forums discuss the phenomena of digitalisation with varying terms, mainly with digitalisation and digitization. These terms overlap and have many similarities in meaning although some differences can be found.

Digitalisation is used by many to describe a change in the ways lives and businesses are conducted. Leviäkangas (2016) describes it being the most significant technological trend faced globally affecting individuals, communities and nations. The Finnish ministry of economic affairs and employment (2018) define digitalisation being a way of conducting business with which companies gain access to new technologies and new business models which are turned into new products and services for consumers, and that it will increase service economy and use of network-style operations in business.

On *digitization*, BarNir, Gallugher and Auger (2003) describe its meaning as businesses transitioning their business activities to be conducted in a digital form compared to prior traditional manners by digitizing their processes by shifting activities in part or in full to an electronic environment. Loebbecke and Picot (2015) describe the history of term '*digitization*' having been originated to describe conversion processes of analogue to digital information. Zimmermann, Jugel, Sandkuhl, Smidt, Bogner and Kehrer (2016) describe the term origin of being used as digital representation of information and processing.

This technical-transitional meaning of the term digitization can be found from multiple sources. For example, Stelldinger and Köthe (2003) discuss shape digitization in image analysis algorithms in their work on bounding geometric distortions between shapes of equal topology. Lanzolla and Anderson (2010) describe digitization from the same viewpoint where analogue services are becoming digital, in their case digitizing contents for online use. Digitalisation and digitization have some differences in the characterisation but both entail the notion of change or taking something new to use, most commonly new technology.

Above definitions on digitalisation and digitization describe businesses taking on digital tools to transform their business. The third concept in defining digitalisation is *digital transformation* which has the vastest content and is the most abstract. Interreg Europe (2017) connects digitalisation definition to Internet of Things (also known as Industry 4.0) which according to Jacob Morgan (Forbes, 2014) *"is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from mobile phones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else you can think of"*. Interreg Europe

(2017) continues from digitalisation to the concept of digital transformation as being the change which transforms businesses and organisational activities, processes, competencies and models, and these changes create future opportunities for companies.

Digital transformation enables companies to make significant improvements in their businesses through the use of new technologies. These new technologies in turn enable technology-driven transformation which have three characteristics: it fundamentally alters traditional ways of doing business; it potentially involves strategic acquisition; and it exemplifies the use of IT to change how tasks are carried out. (Piccini, Gregory & Kolbe 2015.)

Based on literature presented above it can be stated that when defining digitalisation, discussion revolves around business and organisational change through taking new methods and/or tools in use, and about transformation. This transformation can mean putting some new technologies to use or turning business assets and contents into some other form in order for better use, mainly new products and services. The transformative actions when discussing digitalisation are not only technical but also mean for instance new processes, value creation and acquisitions of know-how.

All three definitions include the transformative role together with the element of newness, meaning that digitalisation brings something new to company or business daily lives. Although each of the three have some differencing features when examining closely, the main characteristics (transformative role, change, newness) remain in all. Thus, it can be said that a general definition of digitalisation includes all three definitions.

It is not unprecedented to combine different meanings of digitalisation under one common umbrella term. Digitalisation definition incorporating all three terms describing digitalisation can be seen similar to the concept of "globalisation" which is also a huge term needing more than one definition or meaning. Both are difficult phenomena to summarize and explain as they combine cross-cultural, cross-disciplinary, inter- and intra-geographical, and virtual properties. (Khan 2016.)

Henriette, Feki and Boughzala (2015) introduce digital transformation synonymous to digitalisation which is implemented through digitization and refer it as a business model driven by changes associated with application of digital technology in all aspects of human society. The factors which drive the digital transformation are the technological shift which has broken down market barriers for the benefit of new competitors, new technology supported capabilities which make room for new opportunities, and user generated pressure and expectations to create personalized and cutting-edge solutions. These factors change business models, operational processes and user experience by for example through extended market, demands on customer relations and user collaboration.

This master thesis research assumes this definition of digitalisation which includes all three sub-definitions. This definition is selected due to the nature of the master thesis research target; SME companies' digitalisation which takes form in all digitalisation

meanings. Additionally, considering the SME field comprising of various business fields, it is of curiosity value to explain to the SMEs which sort of digitalisation actions they are taking. Presented later, SME companies daily actions are many times ad hoc and when making the decision to digitalise some aspect of the business, the work should concern the action itself, not the semantics of it.

2.3 The meaning, impact and benefits of digitalisation

On the broadest level digitalisation and technological change will have great impacts for mankind. Over recent years there's been a lot of discussion on artificial intelligence (AI) development and, for example, its effect on employment. There has been arguments made both for and against on whether AI will result in mass unemployment and businesses being completely digitized or will it 'only' change the way people perform work.

A 2014 study (Pew Research Center, 2014) researched on question: *"Will networked, automated, artificial intelligence (AI) applications and robotic devices have displaced more jobs than they have created by 2025?"*. With nearly 1900 answers, the result was divided with 52% stating that AI will have neutral to positive impact on jobs. The answers with this view stated for instance that history does not represent facts to support the myth on technology replacing people, and that technological advancements will shift or displace jobs but job losses will be made up with new job descriptions. The other half (48%) seeing that AI and robotics will end more jobs than create rationalized their view with stating for example that all jobs which will be possible to be performed by robots, will be, and there is no other way companies would choose. One other view stated that humans will not be the best "machines" to get work done.

In the context of SME companies, the benefits of turning business functions to be organized, ran and operated by digital (and IT) tools have many benefits. Digital solutions can enable lower production and labour costs and add added value to products and services (Nguyen, Newby & Macaulay 2015.). It can also provide access to new market opportunities and new niches for products and services (Fulantelli & Allegra 2003). Digitalisation and IT can also give business transforming advantages by business process reengineering and support value chain integration with for example inventory solutions (Ghobakhloo, Arias-Aranda & Benitez-Amado 2011). Benefits of digitalisation also include the opportunity to achieve competitive advantage from ICT advances through innovation, marketing, efficiency gains, better quality and customer responsiveness (Harindranath, Dyerson & Barnes 2008).

The way people, businesses, suppliers and customers communicate with each other is one of the most important business changing benefits arising from the use of digital tools.

Communication and information distribution channels have become faster but digitalisation also changes the dynamic of communication, and the internet is no longer only a platform for information but also for influence. (Stankovska, Josimovski & Edwards 2016.)

BarNir et al. (2003) describe digitalisation benefits in their research theory by stating that they facilitate competitive positioning and pursuit of strategic objectives, and help companies to identify and capitalize e-opportunities which could be for example to inexpensively obtain customer feedback and incorporate the findings into operations.

Khan (2016) presents digitalisation definition through six characteristics which also describe the effects of digitalisation to companies and organisations:

1. **Interconnectedness**. Digitalisation increases interconnection and integration of businesses, tools, communication and social interaction.
2. **Time lag diminish and abundance of information**. Decision-making is performed through shorter timeframes which speeds up information and real-time organisational management by smart phones, tablets and other devices. Abundance of information can be seen by analyses done in global volume.
3. **Increased transparency and complexity**. Transparency is needed due to increasing organisational complexity and more complex technologies change organisations.
4. **Hierarchy removal and dissolvement of personal barriers**. Technology enables more fluid organisations which frees employees from time and attendance, and also breaks hierarchy by for instance allowing bottom-up (from younger generations to senior) training and mentoring.
5. **Decision enabler and integrity enhancing**. Digitalisation enables faster decision-making process on many levels from strategic boardroom decisions to consumer purchase decisions. Integrity and mutual trust have become important factors when selecting partners for honest, open and co-creative business.
6. **Humanising effect**. Digitalisation, through virtual platforms and tools, enables easier interaction, communication and interlink between humans. As robots are developing skills in sensing feelings and environments better with a humanising effect, the interlink between a robot and a human comes closer.

The listing above depicts the benefits and change factors digitalisation can bring to us all including SME companies. Out of the six, the first five can be understood directly affecting businesses and daily lives of SMEs. The last point, the humanising effect of digitalisation, is already affecting businesses through virtual platforms but it will have more grave effect in the future as artificial intelligence development goes further. Humane robots might be seen as an abstract issue and discussion over robot-human interaction going beyond the SME company current needs. However, it is still good to remind us all that technologies change and that the scope when discussing with SMEs should be narrowed to the daily lives and problems at hand.

The impact of digitalisation is apparent in SME context. In order to keep up with competition, SMEs need to implement and utilize latest technologies which ensure that not only data is more accurate and quickly accessible but also that information between process parts is improved and creates value (Mezei, Sándor & Gubán 2016).

3 BARRIER AND ENABLER FACTORS IN DIGITAL TOOLS ADOPTION

Companies are operating in increasingly turbulent and complex environments. For companies to survive they need to become more proactive and innovative. In order to achieving proactivity and innovativeness uncertainties need to be recognised with all relevant affecting factors. This recognition will enable SME company managing CEOs or owners to acquire needed knowledge and begin to implement development or improvement projects in a more structured and controlled way.

According to Stankovska et al. (2016) SMEs function in an 'organic nature' where the owner-manager, employee personality and knowledge affects the way the company adopts new technologies. SMEs way of handling business is characterized by moving from one task to another which excludes them from being able to adapt their cross-functional capabilities into solid business processes, and that there are rarely a dedicated IT staff or well-defined IT function in SMEs (Devos et al. 2012).

Small businesses seem to learn by going from one 'need-to-know' situation to the next one without a wholesome thinking process and situation review. This barrier of not taking full benefits from IT adoption is recognized by literature as well. Nguyen et al. (2015) suggest that IT adoption takes place without wholesome planning and small businesses are not doing enough research before implementing new technologies which is due to business management not fully understanding why the new technology is and should be implemented in the first place.

3.1 Decision-making and IT adoption in SME context

Decision-making in SMEs is many times short-term and intuitive which focuses on reaction more than anticipation. Instead it should be a structured process where the decision-maker who is usually the owner-manager or CEO should evaluate the benefits of each decision and determine whether the target of the decision has internal support from the company. Related to IT, the decision should give a response or solution to some specific problem or task of the company. (Fink, D. 1998.)

Vast number of literature view the decision-making in SMEs to be without structure and planning taking place 'in the moment', on daily basis, and by one or few executives. Decision structures in SME companies are informal, quite centralized around the owner/CEO and lacking consistency (Huang, Zmud & Price, 2010). Decisions are made under conditions of limited processing capability and intelligence gathered which many times lead up to less comprehensive decisions which is due to decision-makers tendency

to make decisions based on their own experience, knowledge and variety of social ties (Jansen, Curseu, Vermeulen, Geurts & Gibcus 2011).

Strategic decision process takes form through human – and social capital which are relevant inputs in decision-making. Human capital is important as decisions are made by one or few persons in a SME company and it refers to skills and knowledge gained by an employee through education and experience. Education is an asset giving advantage of having knowledge, and the higher education a person (decision-maker or employee) has the more specialized and focused his/her knowledge level is. Experience enables decision-makers to draw upon prior experience which in turn enables more complex decision elaboration. Social capital represents the connections decision-maker or employee has with other actors and can be studied with structural dimension which depicts individual actor's position in relation to a group of connected actors. Structural social capital represents the range of actors joined together to tackle limited process capability and intelligence by increasing decision comprehensiveness for the decision-makers use by giving a more comprehensive interpretation of decision situations. (Jansen et al. 2011.)

Human and social capital are important in understanding the factors having an effect on decision-making. They are reviewed more closely in chapter 4 before which decision-making and IT adoption is described through literature on decision-making barriers, enablers and uncertainties SME owners and managers face.

Although digital solutions and tools are easily available, beginning to use these tools seems to have some hindrances in SME companies. Boston Consulting Group (BCG. 2017) conducted a research on business digitalisation. The research was based on a 27-question self-evaluation to 1300 companies in Europe and in the USA. The companies were divided to digitalisation champions and laggards based on their answers. According to results, 23 % of companies based in Europe were digital champions and 25 % lagged at the low end. Same numbers to companies functioning in the US were 28 % and 23 %. The main outcome of the research was that the top performing companies invest in digital solutions, recruit digital experts and overall, live in a digital culture meaning that digital solutions are deeply embedded to the company.

Adoption of information technology is a stage in a company's activities where a decision is made about adopting some specific technology, hardware and/or software, but it is not only a purchase decision. Adoption includes multiple activities in and among management and technical staff of the company which means that in the initial state management and staff needs to be committed to adoption. The decision-making is affected by factors in both internal and external environments. Internal factors include cost benefit analysis, management perception, employee attitude, IT skills and IT infrastructure. External factors are among others consultants, business partners, suppliers, and customers. (Nguyen et al. 2015.)

Internal and external environments and factors affecting adoption are widely discussed in IT – and digital solutions adoption literature. According to Riemenschneider, Harrison and Mykytyn (2002), there are three "fundamental" IT adoption decision parameters:

1) Anticipated positive/negative consequences,
2) Social approval/disapproval, and
3) Perceived ease or difficulty in implementing/enacting the decision

The reasons why executives fail in IT adoption are because they do not see or are not aware of clear anticipated benefits, and they feel social pressure to bringing IT into the company (Riemenschneider et al. 2002).

Harindranath et al. (2008) agree with above and state that SME companies are many times seen at a disadvantage comparing to larger companies. Their research on small company ICT adoption and use concluded that SMEs are affected by limited resources in terms of time, money and expertise.

IT adoption research is viewed also through persons perceived usefulness and perceived ease of use. The first is defined as degree to which a person believes that using a particular system would enhance his/her performance, and the latter refers to the degree of ease or freedom generated by the use of some particular system. Studies have shown that usefulness is more significant factor in adoption decision-making than ease of use suggesting that ease of use can be an antecedent to usefulness. (Davis, 1989.)

To continue with previous, a research on SME internet usage was conducted by Caniëls, Lanaerts and Gelderman (2015), and their research theory bases on market orientation which means companies focus being on market information processing activities and through these creating market-oriented strategies which have an impact on internet usage. Their research results state a positive relation between the two and that market oriented SME companies use internet more than companies which are not market oriented. In addition they found out that perceived enjoyment of using internet is positively and significantly related to perceived usefulness and perceived ease of use. If the SME manager or decision-maker has a perception that internet use is easy they also expect internet to generate benefits from using it. According to the researchers, it is this intrinsic motivation of perceived enjoyment which affects adoption.

Decision-making and factors affecting it in SMEs are crucial to understand when developing insight on SME IT and digital solutions adoption. SMEs function in different fields of business and there are some business field specific issues affecting decision-making. This research and literature review focuses on universal issues affecting decision-making and later adoption of IT/digital solutions, services and tools.

3.2 Barriers

Harindranath et al. (2008) investigated reasons for SMEs investing in ICT. The main three reasons were increase in operational efficiency, improve or enhance customer service, and keeping up with competitors. In the same study perceived barriers to ICT adoption were researched and the three most stated barriers seen by SMEs were 1) concern over costs, 2) uncertainty over business benefits, and 3) lack of internal IT experience. In addition, the lack of strategic insights constrain SME company ICT adoption.

Marketing and social media is one of the biggest and most researched digitalisation topics affecting most if not all companies. In 2012, survey results of conducted to 462 companies by VerticalResponse stated that 43 % of small companies spend 6 hours or more per week on business related social media activities and that around one-third would prefer to spend less time doing these activities. According to the survey the respondents are recognizing the value of social media content but in their view the time it takes is too much away from other work. (Moyle, 2012.) This shows that time is a resource companies view lacking in their work related to digitalisation.

According to Taiminen & Karjaluoto (2015) the adoption of digital marketing tools in SMEs is affected both by internal and external factors of which internal factors play a larger role. Of these internal factors are the firm specific factors like strategy, attitudes and experience. The external factors are infrastructure and operating environment. According to the results of their research, the main barrier to adopting digital marketing is company resources including knowledge and human resources with uncertainty on how to use new digital tools. One other reason for not adopting digital marketing tools is management resistance which is presented in some cases by company executives having prejudices towards technologies like, for example, social media. The resistance was partly and in some cases caused by unfamiliarity with the digital channels.

In an earlier study on determining the factors affecting to micro-sized companies adoption and utilizing of digital channels, Karjaluoto and Huhtamäki (2010) explain that the internal and external factors are divided into three groups; firm-specific and owner-managerial -, resource-related - and environmental factors. The firm-specific and owner-managerial factors overlap in micro-sized companies as the owner-managers have strong influence over every detail of the company. Personal characteristics, know-how and skills, motivation and innovativeness are highly impacting the way business is done. Together with these, digital solutions adopted, technological competence and commitment of the owner-manager are the most important adoption affecting factors.

In micro-size companies the owner-manager is bound by limited resources and in many cases is responsible for most, if not all, activities. With limited amount of time on their hands, the company owner-managers cannot allocate a lot of time to each individual

activity or task. The resource-related factors like abovementioned time, finances or technologies affects the adoption of digital solutions. Financial constraints limit the capabilities companies have for adopting new technologies but there are also studies conducted that indicate financial issues not being always the main reason not to adopt digital solutions. (Karjaluoto & Huhtamäki, 2010.)

Ghobakhloo et al. (2011) state that cost can have a negative impact on adoption of digital tools in SMEs, and according to Riemenschneider et al. (2002) one barrier related to financial factors and investments made to IT and digital solutions is the management's uncertainty in regards to return-on-investment (ROI) which hinders and causes concerns in making the adoption decision. In many cases it is not clear to managers at which point the investment made to IT starts paying back.

From this we can see that the most common barriers are related to resources of time, financials and skills. It seems that the nature of business in SMEs is moving on by a day-by-day basis from task to task without time to put on strategic foresight. Financial constraints are affected by lack of understanding the benefits from investing in IT which is also affected and presented by lack of skills.

3.3 Enablers

Stankovska et al. (2016) state that decreasing cost of technologies, standardization of digital tools and the fact that digital devices are today everywhere is lowering the disadvantages which have been perceived affecting the adoption of technologies in SMEs. SMEs have advantages in adapting new technologies as well as small companies function with different managerial aspects than large corporations. SMEs can do rapid implementation and execution on decisions, their capacity to adopt new things is higher and reorientation period shorter than in large size companies.

Decreasing cost is a factor having positive impact on IT adoption. The barrier concerning prices of products has gone through another change which affects small business IT adoption in an increasing way. Over the last decade the pricing structure of IT and digital solutions has shifted to using pay-per-use payment method.

Using pay-per-use method customers pay according to time, cycles or volume without initial down payments or purchases (Habib et al. 2010). Among others, the benefits of pay-per-use include turning computing power (and other digital solutions distribution) to be like an utility enabling SME not needing their own IT infrastructures or software applications (Neves, Marta, Correia & de Castro Neto, 2011).

Another IT adoption enabler is rapid implementation which comes into the picture with regards to trying out new technological solutions. When a company can rapidly try-

out new digital tools, the outcome can be a successful adoption. Rapid tryouts and willingness to make them is affected by afore mentioned owner-manager/ CEO and employee attitude and personality. Alshamaila, Papagiannidis and Li (2013) also describe trialability as one of the most important components in new technology adoption process and that (business) reinvention might happen during the trial of a new technology.

As background to this master thesis, the role of EU as digitalisation supporter was presented. EU has launched strategies, funding schemes and instruments to enable EU wide digitalisation. These mentioned factors depicted in chapter 2 can be called indirect to SME perspective but EU is also funding companies more directly through other mechanisms. Examples of these funding mechanisms are Business Finland (formerly known Tekes) operated Innovation Voucher and SME Instrument which support SME companies strives in digitalisation, innovation and product development, knowledge accrual to name a few. For example, the 6200 € innovation voucher can be used in acquiring external expertise on internationalization from universities and the SME instrument funding can be applied for direct product development (Business Finland 2018; European Commission 2018c.)

Regarding enablers we can see that despite the barriers of time, money and skills scarcity, there are possibilities and supporting actions taken which aid SMEs as well as all companies in digitalisation. Cost of different solutions is decreasing and pay-per-use payment method is enabling companies to try out different solutions. In addition to pay-per-use, try outs are supported through trials which are also a trend today. Although enablers exist, SME companies tend to be cautious in making investments in IT which stem from various sources of uncertainties.

3.4 Uncertainties

Many studies and researches state that a defining feature and one of the primary characteristics or aspects of small businesses is uncertainty which is caused by companies not being able to predict or control their changing external environment and this inability having a big influence on the companies' operations. Uncertainty is caused by both aforementioned external environment; via relationships, events and influences or environmental context and setting but also by internal conditions. Generating and using knowledge are key components in answering to uncertainty. With regards to knowledge there are three factors influencing uncertainty; nature and dynamic of learning, resource scarcity and effects of it, and business-owner's cognitive stance towards uncertainty relieving actions. Learning in small companies can be seen as moving from one unfamiliarity to another on a 'need-to-know' basis. In turn, SME knowledge generation can be then seen by having the ability to learn from these 'need-to-know' instances. (Atherton 2003.)

Resource scarcity can be seen due to financial constraints, poor management capabilities and skills, and lacks of technology or information. SMEs not putting expenditure on training and special skills needed to overcoming lacks in capabilities, skills and information results in a gap between having the wanted response to an environmental change and the actual response allowed by resources. The stance or viewpoint of the SME owner-manager towards uncertainties is one key factor affecting how uncertainties are encountered and dealt. This cognitive stance means that, in the case of business owner-managers, their decisions are based cognitive procedures and heuristics rather than knowing all the possible solution alternatives or taking in all possible considerations. (Atherton, 2003.)

Atherton's statement on owner-manager cognitive stance being a significant factor affecting SME's way of encountering uncertainties is also found by Katsaros et al. (2014) research, in which they found out that the CEO's attitude towards change influences positively organizations strategic flexibility which in definition is the organizations ability to respond and adapt to environmental changes by allowing performance fostering and core competencies' inimitability.

According to Oikarinen, Salminen and Mäkimattila (2012), the environment SMEs operate in is characterized by constant change where changes can occur unexpectedly. In their research on innovation creation and absorption of new knowledge they state that key feature for companies is to foresee events and factors which will have an effect on their business. Their research results state that SME companies tend not to perceive signals which are not currently affecting their business. This means that companies are welcoming the data or information but do not know how to implement decisions or how to use the information in general. Regarding resources of the companies, there is more shortage of time than on availability of foreseeing tools. They also found out that a workshop manner of training businesses to use and understand foreseeing is not something companies are interested in, one reason for this being that foreseeing is about company strategies which are not something companies want to share with others.

As a key characteristic to small business is the owner-managers or CEO's personal attitude and the businesses are personalized by the owner-managers who personally learn from experience, the owner-managers willingness to taking on new solutions is a key feature for the company. As the working environment is volatile the reactions of small businesses tend to be reactive in response. (Katsaros et al., 2014.)

SME companies function in market and environment which is constantly changing and uncertain. The uncertainties can cause decision-making to become a halt stopping businesses from developing themselves. In order to support companies to further develop themselves by generating knowledge for themselves and to push them towards investing in digitalisation by taking on new digital tools and solutions, uncertainties need to be addressed also by IT- and digital services providers.

We can see that decision-making on IT adoption takes place under various affecting factors. As depicted by above, SME decision-making is constrained by limited resources, mainly time, financial, and knowledge and skills. Out of these, lack of time is seen by companies moving from task to task on a daily basis without long-term plans. Financials are often seen as constraint, but newer payment issues like the pay-per-use and trialability are giving SMEs more opportunities on occasions. Knowledge and skills are many times accrued through learning from (daily) situations encountered and not by plans. Uncertainties are caused by both, internal and environmental issues which vary, and stem and belong to different capital categories.

4 INTERPLAY OF HUMAN AND SOCIAL CAPITALS

Jansen et al. (2011) presents human and social capital important to decision-making as they are made by one or few persons and who need to draw information and knowledge from connections with other actors. *Human capital* arises from the people working in companies and it is based on individual abilities, knowledge and skills. As small businesses are affected by their size and monetary limitations on making high investments in external resources, they need to emphasize and take efficient use of the knowledge and capabilities embedded in the entire personnel from owners and managers to employees. Tapping to human capital through for example the attributes of education, experience and talent will indirectly and directly affect SME performance through enabling innovation and process. (Muda & Rahman 2016; Omri, Frikha & Bouraoui 2015.)

Human capital is a resource of intellectual capital of companies and investments in it will produce proficient employees who will enhance the value of companies by increasing not only performance but also competitiveness (Kamaluddin & Abdul Rahman 2009). In relation to ICT and digital solutions adoption in SMEs, Martin et al. (2013) state that the problem concerning human capital is the fact that many owner-managers of SMEs are not familiar with and lack knowledge on ICT solutions which leads to unwillingness to invest in them. This will hinder growth as, according to their research results, adoption of ICT will generate economic growth which will lead to increasing complexity of production processes making the business more competitive and adaptable to digital requirements.

Social capital can be defined as SME decision-makers connections to other actors which together can help tackle limited processing capability and other limitations SMEs face by providing more vast and comprehensive intelligence for decision-makers (Jansen et al. 2011). Social capital also affects the competitiveness of SMEs and involves also knowledge. It can be defined as assets located in networks of relationships, in the members of networks. These assets are resources which are capital and can be accessed and mobilized in purposive actions. In SMEs the entrepreneurs personal social capital serves many times as the company's social capital and the entrepreneur lends his/her networks to benefit the company. (Hernández-Carrión, Camarero-Izquierdo & Gutiérrez-Cillan 2017).

Social capital's components are the social ties in networks, trust and shared vision among the members. The benefits or advantages companies can draw from social interactions revolve on performance, cooperation and competitive advantage gains. The relationships of people within social structures facilitates human action and interaction and these networks can provide access to intangible resources like knowledge which together with communication skills and capabilities enable even better and more in-depth access to social capital (Lee, Park & Lee 2015). Sharing information and knowledge is beneficial

as it can create innovation through increasing creativity, new knowledge, knowledge sharing and acquisition, and ideas (Omri et al. 2015; Hernández-Carrión et al. 2017).

Social capital can be divided to two concept views which both can have an impact on all businesses performance. *Bridging view* of social capital describes network relationships which are large, diverse and connected weakly, and it can provide resources but also explain differential success companies have as each relationship is different. Bridging social capital networks are defined as relationships with professional and institutional networks with partners, workers, customers, government entities and other. In turn, *bonding view* of social capital depicts small networks in which members know each other well, and in these type of networks ties between family members, friends and for example volunteer associations. In bonding relations ties are strong and trust is relatively high. Out of the two, bringing social capital is seen more critical and valuable to entrepreneurs and SME companies as they provide resources more. (Stam, Arzlanian & Elfring 2014; Hernández-Carrión et al. 2017).

As we can see, these two capitals' main factors are knowledge, networks and trust. They are inseparable from business and can have grave effects on SME companies. In the following three subchapters these factors are reviewed in SME context.

4.1 Knowledge and employee training in SME context

Knowledge plays an important role within companies, it provides means to make coherent decisions and as knowledge level gets higher, the more focused and specialized the decision-making can be. Collaborative work which brings together companies, consultants, non-profit institutions, academics, government entities, customers and other partners to joint projects enables these parties to draw information and ideas from this network of parties. It is the collaborative knowledge which makes new resource creation and sharing possible. (Marlowe, Jastroch, Kirova & Mohtashami 2012.) The (knowledge) information can be *explicit*, relating to codified and codifiable information, or *tacit* meaning that the information is many times in the minds of the people working and transferred from entity to another via face-to-face meetings on informal dialogues and, for example, mentoring. Knowledge can be oriented externally or internally. *External-oriented* knowledge means that information can come from, for example customers, external consultants, competitor analysis or collaboration alliances. *Internal-oriented* knowledge originates from within the organisation. (Choi, Poon & Davis 2008.)

According to Alavi and Leidner (2001) it is the application of knowledge not knowledge itself which can provide competitive advantage to companies meaning that knowledge needs to be applied and integrated to company processes and includes organisational culture and identity, routines, policies, systems and many other. Knowledge

management (KM) is needed to make use of knowledge and to benefit from the competitive advantage it can provide. KM can be enhanced through information systems which can expand the organisational memory for example via document management. The knowledge management work can be applied by mapping out the internal knowledge and expertise of an organisation. Soliman and Spooner (2000) continue that the benefits of having knowledge mapping and management helps companies and organisations to reduce the number of errors or rework, and can minimize manufacturing cycle times in some companies.

Whelan and Carcary (2011) describe that companies' performance is highly linked to employee competencies; knowledge, skills and abilities to carry out tasks. The key challenge is tension between employee personal goals and organisational constraints meaning that personal ways of learning need to be aligned with organisational requirements. Talent management (TM) activities is proposed to develop abilities. Comparing knowledge management to talent management, knowledge management has not established a link between the two concepts and TM is required for effective management and mapping out who has key knowledge, what kind of talents need to be recruited, what kind of training is needed and succession planning. Competency-based training and high-quality training helps companies asses their employees by identifying required competencies, developing skills, knowledge and attitudes, and through these improve performance. The training can be done via single event training such as workshops or through vast training programs. (Whelan & Carcary 2011.)

Knowledge is a main asset of human capital in companies and it dictates for example how in-depth and advanced strategies the company can make. In relation to social capital, knowledge together with communication that foresees knowledge sharing is an antecedent to raising social capital. Knowledge facilitates learning and knowledge exploitation which in turn enable knowledge conversion to core competencies of the company. (Omri et al. 2015; Lee et al. 2015; Yli-Renko, Autio & Sapienza 2001).

For SMEs knowledge and knowledge management is important and as described earlier, SMEs daily lives is characterized by living in resource scarcity with limited time, money and expertise. For this reason it is not probable or it cannot even be recommended that SMEs should implement separate knowledge management information systems or large-scale investments. But knowledge management doesn't always need information systems. As information is also tacit in the minds of people within companies and transferred through face-to-face meetups informally. Acknowledging this can provide a way for SME companies to tap on knowledge, and the owner/CEO of the company should provide informal opportunities for knowledge sharing.

Communities-of-practice are described as groups of people which are informally bound together by shared expertise and passion for a joint enterprise, and which are an effective way of learning and sharing information. These communities of practise emerge

through diverse situations to resolve problems quickly, to transfer best practises, to develop and acquire skills, to help drive strategy, and even start completely new lines of business. The informal nature is key characteristic of a community of practise as it stems from employee personal interest and willingness to belong to it, and it is the role of the organisation to facilitate the possibility for them to emerge. (Wenger & Snyder 2000; *see*: Brown & Duguid 1991.)

Knowledge moving in and through networks depicts also a link between social capital and communities-of-practise. Learning can be acquired from alliance partners which creates new knowledge. The concept of social capital was originally developed for studying communities from where it was applied to intra- and inter-organisational studies. As, for example, communities-of-practise can also involve customers, they should not be overlooked and be utilized for knowledge acquisition. (Inkpen & Tsang 2005; Yli-Renko et al. 2001).

Thus, communities-of-practise can be powerful way of knowledge sharing and making businesses more efficient. Knowledge, talent, competencies and their sharing play a vital role in SMEs lifecycle. Together with outsourcing, networking and trust they are some of the key components in human and social capital of companies both which SMEs should accrue, strive for and maintain.

4.2 Outsourcing and networking relationships in SMEs

Businesses having an outsourcing contract with a vendor or businesses belonging to some form of network is normal business today and with either of these forms of co-operation businesses aim to gain benefits by for example getting competitive advantage, cutting IT infrastructure costs or other. Outsourcing and networking are not synonyms in their concepts and definitions but both deal with businesses having relationships with internal or external company people, organizations or other entities.

IT outsourcing is a process of organisation deciding to contract-out (or sell) company's IT assets, people and/or activities to a third party, who in exchange for an agreed fee and over a period of time oversees and manages the asset (Kern & Willcocks 2002). Outsourcing has the potential benefit of lowering technological barriers found with IT adoption discussed and researched by Karjaluoto and Huhtamäki (2010).

For the outsourced vendor, it is important to maintain vendor-client relationships and put time into getting acquainted with customer company business. Understanding and learning the business drivers and where business is heading are the only successful way suppliers/vendors can provide needed services (Kern & Willcocks 2002). SME companies having interactions with vendors, suppliers, other companies and people from various relationship networks (Nguyen et al. 2015) which can provide competitive advantage

by giving a group to solve problems with and recognize opportunities with (Wasdani & Mathew 2014).

Outsourced external consultants can take over some tasks of SME companies or act as trainers for SMEs to take use and learn new skills. A research done in Italy studied whether the presence of an external consultant can stimulate the application of digital tools. The context of the study was promotion of "Made in Italy" for Italian products, and the research focused on bringing a company external "digitalizator" – an individual with advanced skills in digital matters bringing companies competitive advantage through digital tools training, tools, skills and making sure that digital adopters become self-reliant. The results presented that the outsourced "digitalizator" had positive impact on business, he/she brought awareness of tools available and acquired skills related to digital marketing. (Aiello et al. 2016.) The results are important as it shows that external actors can bring good advantage to companies.

In external relationships, the external advisers provide information and behavioural examples which are unavailable or prior unknown to SME decision-makers. These relationships provide opportunities for self-development for the SME decision-maker through interaction. (Jansen et al. 2011.) Taking the concept of social capital into consideration in SMEs, generating close professional relationships can create competitive advantage for SMEs as close relationships are rare, inimitable and non-substitutable (Hernández-Carrión et al. 2017). Outsourced IT service providers and vendors can act as such professional network members.

As small companies function in an environment which is turbulent and full of uncertainties caused by both company internal and personality related issues like learning, time and finances, and external environment issues like customer relationships, there is need to company external suppliers and knowledge on IT solutions. Having good outsourcing relationships requires inputs and careful consideration from SME companies and IT service providers and vendors. With both environments, internal and external, and relationships within them, trust plays an imperative role.

4.3 Trust, recommendation and reputation

Smaller businesses having less ability to acquire internal IT capabilities and techniques leads to outsourcing the required skills, knowledge and technologies. When companies outsource IT they enter into a contract of trust which is both formal and written and also a psychological one. The written contract usually contains structured controls and agreement on evaluation methods used. The psychological contract on trust limits the need to have these structured controls by lowering needs to guard either parties' opportunistic behaviour in turbulent IT projects. By a definition, trust is the belief that all parties will

fulfil their commitments and will not act in an opportunistic manner providing the other trust depending parties fairness and ethics. (Devos et al. 2012.)

Trust plays an integral role with outsourcing and network relationships. In order for successful team formation, cooperation and positive social support with outsourced entities there must be a high level of trust, which needs to be earned over time and which evolves through determinants of trust, for instance, confidence and willingness to share information (Kern & Willcocks 2002). Trust is seen essential for emergence and repetition of cooperative behaviour as fear over opportunistic acts is alleviated by trust (Rese & Baier, 2011). And, if norms of network or cooperation is violated there will be consequences such as loss of reputation (Aldrich & Kim 2007).

Kumar, van Dissel and Bielli (1998) describe trust as an informal mode of controlling which governs mutually identified actors and suggests it reduces uncertainty through self-control against opportunism. They presented the concept of relationships and trust in relation to information systems (IS) and information technology management. By that far IS use and acceptance in organizations had been viewed with two rationalities; system rationalism and segmented institutionalism. *System rationalism* views the actors/stakeholders of an organization taking on the same goal of maximizing economic efficiency and effectiveness through use of technology. The latter, *segmented rationalism*, views organizations and IS management through human and social phenomena where actors are engaging in conflict, intrigue and negotiation based on their private interests. By this view actors work to achieve their own goals during which they affect the organizations objectives. In reference to the second rationality, the researchers saw the social phenomena being more than conflicts and politics and presented trust as a rationality in research of the role of IT in and between organizations.

With the prior two rationalities, the focus was on maximizing the used technologies utility to benefit the organization and to gain political or other power to reach individual goals. The rationality of trust and relationships identifies that there can occur and be built win-win strategies for actors of organizations and between them where trust functions as a counterbalance toward opportunism. (Kumar et al. 1998.)

Although trust is long ago recognized as one key factors is business relations, it still needs to be incorporated into IT and digital tools adoption research. Devos et al. (2012) found that in many cases, the sales representatives of the vendor made promises in the tendering phase of a project which could not be fulfilled when the project was started leading to distrust and challenges for the success of the project. They also referred to an earlier study on having evidence on opportunistic behaviour where both clients and vendors behaved opportunistically when entering into a contract leading to mutual disadvantage. By their understanding outsourced information system project failure occurs because of lack of trust of the principal in the actions of the agent during an IS project.

Trust in co-operative or vendor-client relationships does not work if there is not a contractual relationship set as the basis on which business is done. Trust is not existing from the beginning but is something that needs to be built during the relationship between a vendor and a client. Trust in this form is about confidence in the vendor to deliver the contract terms in problem attending, fair and honest way. (Kern & Willcocks 2002.)

Trust can be seen in different forms in organizations today depending on the viewpoint. Referring to above definitions, internal trust can mean actors aiming for a joint organizational goal with the same time pursuing their own interests without turning the organizations environment into opportunistic battlefield. Like we saw above, trust contract is both formal and written having stated structured controls but also psychological and personal which are not excluding the other and both having important effect on how actors and organizations function together. They both aim for unified norms and transparency between actors.

Structured controls on trust can be seen as parameters aiding companies in decision-making. One of the forms of today's IT outsourcing is companies purchasing server space from cloud computing providers and in research regarding trust and reputation, the trust parameters include among many service level agreement (SLA), Compliance or accreditation or certification, security measures, and user recommendation, feedback and publicly available reviews. Although parameters can be set and stated but they each have some challenges to them.

The relevant parameters and their challenges regarding trust in broader manner rather affecting only the cloud computing business are as follows (Habib et al. 2010):

- SLAs are readily made to protect vendors from legal actions with little room for customer negotiation
- Common standards are missing from certifying accreditation
- Vendor evaluation by a third-party is still missing from many IT service areas
- Trust representation to customers is missing in many cases; for example, trust is in many cases subjective measure not coming from outside the company from for example, customers.

Trust has an imperative role and also can be seen as a linking factor between outsourcing, networking, knowledge and knowledge management. In context of knowledge sharing trust supports mutual understanding by building upon transparency of purposes and views between collaborators and by thus creating reliability (Marlowe et al. 2012). It is the shared cognition on values which reduces possibility of misunderstanding and promotes trust as members of a network can share information with confidence that the exchange partner will not act in a way which causes negative outcomes. Trust among networking partners can even reduce transaction costs and when on high level lead to investments in learning. (Yli-Renko et al. 2001; Inkpen & Tsang 2005; Li, Wang, Huang & Bai 2013; Lee et al. 2015.)

Recommendation and reputation are important factors in choosing IT service providers or vendors and they are closely linked to trust. Recommendations and public reviews play a huge role today and potential customers seek information on businesses and vendors online and the same goes for when companies are selecting business partners. Stankovska et al. (2016) came to the conclusion that good reputation of the technology vendor is a more influential criteria for the SME than cost or payment advantages for making the choice, and that the driving force when selecting technology vendor is not price or payment but the good reputation of the vendor.

Reputation is defined to be a peer's belief in another peer's capabilities, honesty and reliability based in recommendations received from other peers (Wang & Vassileva 2003). Reputation matters significantly and as companies have anxieties and levels of distrust towards outsourced consultants, they turn often to working with consultants recommended by known contacts. Consultants are the main source for outsourced support and information followed by personal ties such as family members and friends. Reputation affects the social capital of firms and through high-level reputation more business can be derived. If for any reason an actor would violate the network's norms, the actor would be punished, the reputation would lessen or the actor could be even expelled from that network. (Harindranath et al. 2008; Inkpen & Tsang 2005; Li et al. 2013.)

Trust is key for companies both internally but also in external relations as it provides foundation for knowledge sharing and with high level of trust, companies are more prone to investing in different types of relations such as knowledge acquiring from outsourced networks. Regarding factors affecting IT and digital tools adoption, we can see that there is a multitude of constraints but also possibilities and supporting factors that affect the IT decision-making in SMEs. For helping and enabling SMEs in this decision-making there are many different tools, frameworks, methodologies and maturity models developed which are aimed at identifying location and the aspects that should be developed in SMEs.

5 MATURITY MODELS, METHODOLOGIES AND FRAMEWORK TOOLS

Companies have multiple ongoing situations, factors to take into account and uncertainties towards development investments. For tackling the uncertainties and to help companies in realizing their current situation and provide information on what to do next, what to develop and on which factor to put emphasis on, many tools, frameworks and maturity models have been developed (see: e.g. Khoshgoftar & Osman 2009; Alshamaila, Papagiannidis and Li 2012; Röglinger et al. 2012; Škinjar & Trkman 2013). All of these target at creating more knowledge and insight for businesses and support future actions. Hoorn, van der, Duffield and Whitty (2016) discuss about organisational sensemaking in their research and define the term being concerned with how people deal with ambiguous situations in their company and business, and they refer to ambiguity as being a result of multiple different possible interpretations of information. There are three core elements in sensemaking (Hoorn, van der et al. 2016);

1) They explore the wider system (seeking information or having experience),
2) Create a map of current situation (considering most suitable framework), and
3) Act to change the system to learn more (making changes to confirm situation).

Sensemaking is a crucial concept in companies both SME and larger as it is the way company actors are making a sense of a situation which, ideally, build collective understanding. Sensemaking is important because it not only affect the human behaviour but is also the essential, prior to action, part. (Hoorn, van der et al. 2016.) Different maturity models, methodologies and frameworks aim at enabling sensemaking of various and often ambiguous or uncertain situations.

Maturity models are an approach aimed at improving businesses capabilities in regards to business processes. There are multitude of these models and there is no accurate number on how many different maturity models there actually exist. Maturity models are defined as models including sequences of levels which construct anticipated, desired or logical path from some initial state to maturity with the purpose of outlining these states or stages of that maturation path. The current level of maturity within a company or organizations represents capabilities the company has in regards to the factors in that specific target of evaluation. The basic essence of maturity models is to provide information on the level of business or other construct such are for example technology for the company. These provide knowledge on which direction the factors of each level should be taken to. (Röglinger et al. 2012.)

The purpose of maturity models is to enable better performance measurement in companies which can be achieved through managing processes and practises, and the underlying assumption behind maturity models is that higher maturity level results or leads to

better performance. The use of these models develop managerial capabilities in companies, also in SMEs, and generate diagnosis on organisation's performance, enable learning and identify improvement opportunities. (Bititci, Garengo, Ates & Nudurupati 2015).

There are multiple, even hundreds of maturity models constructed for companies to choose from, but they generally include three factors in one form or another; business aspects, technological factors and people matters (Naskali, Kaukola, Matintupa, Ahtosalo, Jaakola & Tuomisto 2018; Khabatian, Hasan gholoi pour & Jafari 2010). Although these factors remain, maturity models are different in their content and points of emphasis, and focus on, for example, business process mapping, innovation, technology and knowledge. Knowledge management maturity models focus on the level of capabilities that exist in an organisation and how they are utilized in decision-making (Khabatian et al. 2010). New maturity models keep emerging and there is no one specific model that can be recommended for all. Regarding technology, the breakthrough of IoT solutions also known as Industry 4.0 is resulting in new maturity models. Industry 4.0 will change design, manufacture, operation and service of products and companies need maturity models which will enable new opportunities seeking (Ganzarain & Errasti 2016).

Maturity models have encountered some criticism. According to Röglinger et al. (2012), the descriptive stages can only be textual descriptions not stating the appropriate measures to be taken in order to develop nor does the developers of maturity models state clearly to whom are the models directed at and in which setting they should be used. Additionally these models are oversimplifying reality and lack empirical foundation aiming to a predefined end state not looking into the factors affecting change or evolution.

Maturity models enables companies to assess their process maturity and take upon improvement actions making the businesses more sustainable but, however, leave it possible for the company to move from one maturity stage to another without improvement in business process as process maturity and organizational maturity are many times separated (Albliwi, Anthony & Arshed 2014). Maturity models aim to be comprehensive to the extent that they are too complex to be implemented in practice (Škrinjar & Trkman 2013). Regarding SME companies, there is a lack of maturity models aimed for the smaller size companies (Igartua, Retegi & Ganzarain 2018).

In contrast to criticism there are still benefits from using maturity models. These include the increase of companies' capabilities to assess their performance in a comprehensive way enabling them to evaluate themselves against other companies using the same model. It presents the evolution, progress and steps taken with regards to the entity evaluated, and it identifies weaknesses and strengths the companies have. Following some maturity model states that the company using them benchmarks its process handling and is finding out the best practices for them. (Khoshgoftar & Osman 2009.)

The problem with maturity models in SME context is that, if large organizations and companies face problems understanding the full usage and form of maturity models it can

be stated that SME companies won't find them useful to them. Like we saw with business process methodologies, the problem of SMEs is that they don't have enough time to start implementing vast programs to reveal their operations and processes. Although it is important to recognize the existence of maturity models and the advancements they can provide for companies, the SMEs functioning in uncertain and turbulent environment need some other kinds of tools.

5.1 Importance of understanding business processes - methodologies

The literature described SMEs to function on a 'task-to-task' based way leaving structured analysis and long-term review of business, its goals and even future plans to an extent unknown for the owner-manager/CEO and the entire staff. The daily tasks and decisions made on the spot depicts the everyday life of a business. In order to succeed SME owner-managers would need to stop and review their business and determine the next goals for the business and start acting accordingly aiming for those set goals for the business to grow or even to maintain its position in the market.

Companies need to understand their business and business processes in order to determine where the next investment or other emphasis should be targeted to or aimed at. Škrinjar & Trkman (2013) state that there are different methodologies for reviewing business processes and below three are presented: Business Process Management (BPM), Critical process targeting method (CPTM) and Plan-Do-Check-Act (PDCA) methodology which all have been used in SME context. The aim of using methodologies like the BPM, CPTM or PDCA is to improve companies Business Process Orientation (BPO) which itself leads to higher level of operational performance and the level of BPO in companies is often evaluated by levels of maturity.

Business Process Management (BPM) is a structured method of understanding, documenting, modelling, analysing, simulating, executing and continuously changing end-to-end business processes and relevant resources. The aim of the method is to increase companies' abilities to add value to the business. Although BMP is firstly designed for large sized companies, SMEs can gain the same benefits which are among others allowing closer monitoring and optimizing of processes, giving out accurate information and data on activity fulfilment, and by alerting responsible staff members of their tasks. (Chong 2007.)

The reason why SMEs can overlook methods for business process management is that they are not well informed on business process management and the benefits it can provide. The perception of these solutions being costly and resource-taking to adopt is not always the case and even evidence of these affecting factors exist the knowledge factor seems to have more emphasis. SMEs need be made aware of BPM solutions and should

turn to using these solutions as they enable business development in global environment and bring increase or sustain the current levels of efficiency and profitability. (Chong 2007.)

For larger companies it is important to align business strategy and the business processes with IT strategy in order to successfully operate in a competing market. Measuring the impact of IT can be difficult but it can be said that it's not about the IT itself that brings advantage to the business but the way IT enables processes and procedures to become faster or more accessible. (Trkman 2010.) The same can be applied to SME context. It is important for companies to understand their business and which IT solutions can bring them advantages and how.

For SMEs to make more informed business decisions, the critical process targeting method *(CPTM)* was designed. This understanding means that SMEs are able to explain, justify, extrapolate, relate and apply knowledge on their business which is vital for future success and in the competing market. The reason why companies need to understand the processes in relation to IT is the mere fact that IT is designed as a supportive and facilitating factor in business success. (Salas, de, Lewis & Huxley 2017.)

By this definition it seems that the BPM and the CPTM methods are corresponding with each other and answering to the same issue. According to de Salas, Lewis and Huxley (2017), the CPTM is designed for SME and especially for the medium-sized companies use and contains only two main elements; the identification of critical processes and selection of which identified critical processes to improve. Critical processes are identified by dependency towards them, probability of failure and impact. The selection on which processes to improve is done by cost-benefit analysis, criticality, and probability of success. During the case study, the CPTM took 13 and 12 days to implement for the businesses and companies needed to have a strategy for their business prior to CPTM processes which led to companies seeing that reviewing business through business processes was seen too much resource taking in regards to CPTM. The brief case study revealed that although beneficial to medium-sized companies, time to implement was difficult for small businesses to find from their schedules.

It is notable that the companies did gain positive results from using it and after putting the required resources they were able to make more efficient decisions on improving their businesses. However, SME companies and especially the smallest companies are lacking strategies meaning it would take up even more time and other resources to begin using the methodology.

The Plan-do-check-Act (PDCA) is an inductive and experimental method and data using cyclical method for continual process improvement. It is a powerful and effective tool which basis on the idea that the cycle's previous stages create some specific benefits and mitigates threats. PDCA is also known as the Deming cycle and it includes four stages; plan, do, check and act where the planning stage revolves around problem identification

and analysis. The ‘doing’ stage is essentially the implementation phase of the improvement and at ‘check’ stage evaluation of results of the implemented improvement is carried out. The last stage of the cycle is ‘act’ at which the improvement is standardized, if found suitable and successful. In addition to continuous improvement, the PDCA method has been used during change implementation, implementation of new solutions, between phases of projects and during process improvement review. Figure 2 below shows the cyclical characteristic of PDCA. It also depicts its idea as continuous improvement aiming where over time the quality improves. (Johnson 2002; Jagusiak-Kocik 2017; Dudin, Smirnova, Vykotskaya, Frolova & Vilkova 2017; Prashar 2017.)

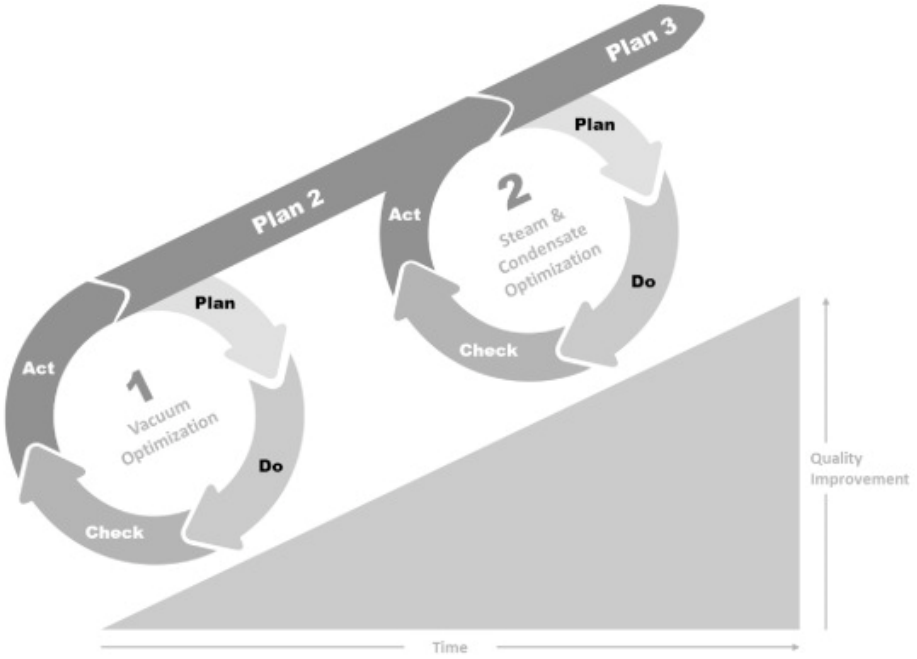

Figure 2. PDCA model and continuous improvement. (Prashar 2017)

The PDCA model has been implemented in many SME companies from various fields. Like many other authors, Prashar (2017) defines it as a model that is intended for continuous improvement but also identifies specific tasks to each of the four stages;

Plan	Ensure management commitment
	Create management roles
	Understand current (situation)
	Create strategy or policy
	Define performance indicators
	Benchmark performance
	Create action plan

	Evaluate technical and economic feasibility
Do	(Establish) effective communication
	(Establish) staff motivation
	(Establish) training
	(Handle) documentation and record control
Check	Monitor and analyse key performance indicators
	Periodic performance reporting
Act	Regular audits and management review for identifying new opportunities

Table 1. PDCA model with tasks. Rendered from Prashar (2017).

Table 1 presents and depicts the stages in more depth with the separate tasks assigned to them. Although Prashar uses the model and tasks in a business field specific context, it shows the multiple factors to consider when implementing it and that the model covers many aspects which can require time and other resources to implement. Chakraborty (2016) also describes the use of PDCA within SME company context and he follows also the same definition of stages as many others in literature. However, in regards to the 'act' stage, he brings out three possibilities SMEs need to act upon and they need to determine whether to adopt, adapt or abandon the cycle's improvement (Chakraborty 2016).

Reviewing the results of implementing the PDCA in SME companies, Jagusiak-Kocik (2017) states that the cycle is versatile and simple to implement, and can be successfully used in companies striving for continuous improvement. Prashar (2017) found that the use of the model encouraged and enabled continuous investigation of new solutions in SME context.

We can see that the PDCA model has received good reviews from different researchers. The same results can be applied to many models and methodologies. The three models and methodologies presented all emphasize the importance of companies to understand their business and its processes which of course are crucial. However, as we know by prior literature, there are other aspects in businesses which need to be taken into account especially when considering the adoption factors of IT in companies. Companies need to emphasize the human and social factors as it is the people in organisations who use the IT solutions. Like there are multiple maturity models and methodologies to choose from, there are equally many frameworks and tools which include the human factor.

5.2 Environment and human behaviour – frameworks and tools

In addition to maturity models and methodologies literature presents multiple different frameworks and tools SMEs can use to identify their status and business affecting adoption factors. Some framework tools and models take the human aspect viewpoint making it as core part in them. There are many different solutions available for companies to use of which three are presented; the Technology-organization-environment (TOE) framework (Ghokbakloo et al. 2011), Technology Acceptance Model (TAM) (Gangwar, Date and Ramaswamy 2015) and Theory of Planned Behaviour (TBP) (Awa, Ukoha & Emecheta 2012) which are separate but have been utilized closely linked together.

Concerning SME adoption of IT solutions, literature presents the *technology-organization-environment (TOE)* framework as a framework to study adoption. The framework considers the circumstances of companies with these three factors and it has been used in several information systems (IS) studies from electronic funds transfer (EFT) to enterprise resource planning (ERP). (Ghobakhloo et al. 2011.)

TOE is a multi-perspective framework and an organizational-level theory representing one level of the innovation process depicting how the firm-level context influences the adoption and implementation of innovations. According to the framework the three aspects influence innovation adoption process. Of these, the technological context represents the internal and external technologies related to the organization including the ones already in use and the ones available but not in use currently. Organizational context represents resources and characteristics of the firm like the size and the managerial structure. Environmental context represents the operating environment of the company like competition, service providers and industry. (Alshamaila et al. 2012.)

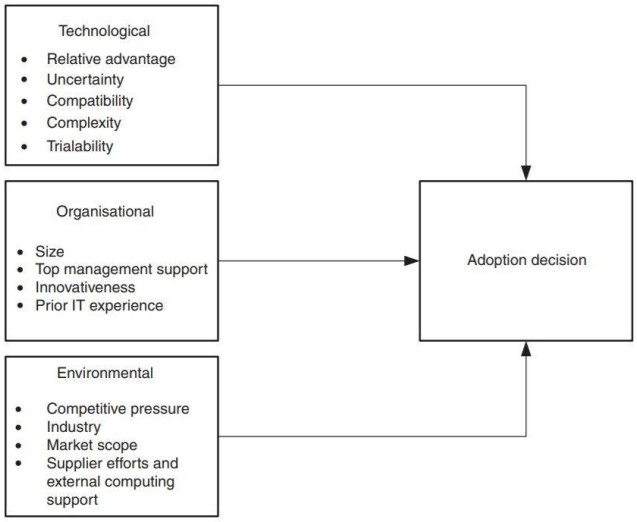

Figure 3. TOE framework for SME adoption. (Alshamaila et al. 2012)

The TOE framework has been applied to many IT adoption processes with variety of ways. Scott, Judy E. (2008) researched the application of TOE framework within aviation industry e-transformation and came to general conclusions that competitive pressure motivates cost reductions and increases operational efficiency, and that organisations need to prepare for technological innovation in order to realise the benefits. She also found that management needs to communicate new vision (of technology) to prepare employees for the change.

Like seen already above, the TOE framework is not only used in research to discover IT adoption issues in large organisations or industries. Alshamaila et al. 2012 studied cloud computing adoption in SMEs and concluded that the dominant paradigm in studying innovation adoption includes identifying contingency factors that enable or hinder adoption decisions. They state that TOE framework proves to be a holistic enough to capture the adoption factors in cloud adoption, and that the first three most significant factors were perceived relative advantage, uncertainty and geo-restricting (restricting access through location data). Comparing with the above aviation industry research, this study did not find evidence on competitive pressure being a significant determinant.

TOE framework has been in use for many years now, and it has been integrated with other tools and frameworks to better understand adoption. *Technology Acceptance Model (TAM)* is used often in research to understand the individual level decisions made on adopting technologies. Where TOE depicts the company level of adopting IT/ICT technologies, TAM focuses on individuals' behaviour and intent to use technologies. TOE-TAM model by Gangwar et al. (2015) combines the TOE framework with perceived usefulness and perceived ease of use (described in chapter 2) in order to capture the individual level decision factors related to IT adoption. They come to the conclusion that TAM factors are mediating external factors for the framework. They also found that companies need to recruit IT skills to keep up with competition as well as investing in technological resources.

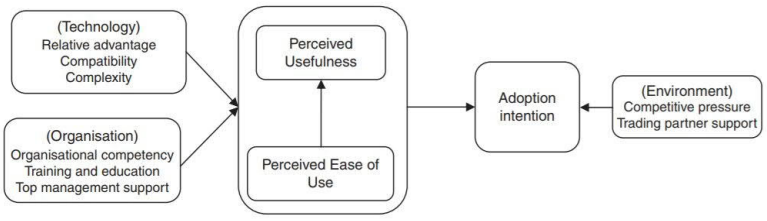

Figure 4. Integrated TOE-TAM framework. (Gangwar et al. 2015)

Ghobakhloo et al. (2011) coupled the TOE framework with TAM also in their research on eCommerce adoption by SMEs. The model suggests that perceived usefulness of a

system is one of the causal preconditions with new technology adoption and usage behaviour. They come to the conclusion with their research that perceived usefulness can be a factor in IS adoption but it can be lost to the vast definition of electronic commerce within their research.

Another research combining the TOE framework with TAM model also included *TPB – theory of planned behaviour* to the mix. In addition to organisational adoption factors provided by TOE and individual, personal, attitudes and factors brought by TAM, TPB examines subjective norms and perceived behavioural control to explain perceptions affecting acts performed. The reason to combine these three and for the research is that although SME companies are assumed to be agile, flexible and receptive to novelty by literature, they in fact seem to lag behind in ICT opportunity exploiting, and that e-commerce adoption in SMEs is very slow mainly due to lack of experience and little awareness of strengths provided by IT infrastructures. (Awa et al. 2012.)

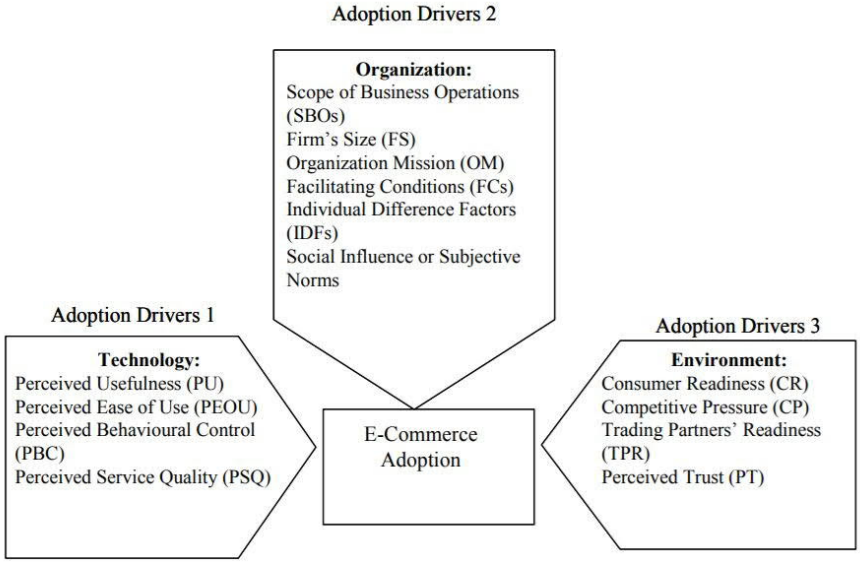

Figure 5. Integrated TOE, TAM and TPB frameworks and models. (Awa et al. 2012.)

The research results provided worthy information on how companies adopt e-commerce solutions and how the use is improved after adoption. The researchers state that according to their findings, the integrated framework is more comprehensive and it betters TOE and TOE-TAM frameworks by giving improved explanation and predictions to IT adoption issues. One key finding is that conscious assessment forms attitudes towards adoption which in turn lead to behaviour later. (Awa et al. 2012.)

There are many tools and frameworks which take the human aspect into account when considering IT adoption in companies and organisations. What affects IT adoption according to the studies are perception advantage gained from the use of systems, perceived usefulness and ease of use which are affected by subjective norms and perceived control.

On practical level, studies show that uncertainty over these factors is apparent and companies lack skills, expertise and resources regarding investing. SME companies need support in realizing their current business situation and factors which are affecting their company subjective status.

5.3 Business Transformation Map Nine-Field

The multiple maturity models, methodologies, frameworks and tools reveals that there is not a unified way to approach the issue of IT adoption or business landscapes in general. This is due to the fact that there are so many different business fields and ways of doing business. All these different approaches are designed to empower companies, SME and larger size, to make better decisions on in regards to their business, and new ones are emerging. Literature also shows that SME companies face many problems regarding the adoption of new technologies and tools. These tools, methodologies and frameworks are in multiple occasions designed for larger size companies and the ones designed for SMEs still require resources, mainly taking up time to implement or to establish.

One model developed for identifying the current status of SME companies in processes and in their overall situation is the *Business Transformation Map Nine-Field*. The model is designed at Work Informatics unit in Turku University, Turku School of Economics and is currently being piloted with target companies by the research team. The model was developed by Juhani Naskali and Jesse Kaukola initially in 2016 and its aimed purpose is to identify issues and factors in regards of SME companies' business maturity, technological maturity and social maturity and to help identify the next logical step for businesses to take. In comparison with established maturity models, the Business Transformation Map Nine-Field is prescriptive rather than descriptive and aims at giving guidance here and now, to the current status of companies. The guidance steps given help in determining what to do and where to start improvement. The steps are often supported by digital tools. (Naskali, discussion, 12.4.2017; Naskali et al. 2018)

The three-tier nine-field is designed to be a 'one-view-model' to review the past, present and future state of business, technological and social maturities. The elements or factors to each section slot are gathered through interviewing or discussing with SME companies which vary between different business fields, company structures and ways of doing business. The nine-field mapping model aims at bringing insight to SME companies' current business and give direction of IT development goals that should be next solved. The model is meant to be used in cooperation with an information systems specialist and representative of the company or between parties in the company in questions. The use of the model requires expertise in many business fields, for example IT. As for persons who are not IT knowledgeable, the use of the tool can be misleading and thus

some level of IT knowledge is needed. In addition to IT, the nine-field maps out current business situation and social context of businesses. It is the view of the models developers that tools depicting current business environment do not need to be vast to deploy and that in order to start a justified IT/digitalisation improvement project, the ground work to identify the current state and the goal can be achieved by one interview sessions. The model provides a snapshot nature view of an individual company and aims at giving guidance and prescription on what entities or factors of business to start evolving next. (Naskali, discussion, 12.4.2017; Naskali et al. 2018) Figure 6 presents the one-view nine-field model.

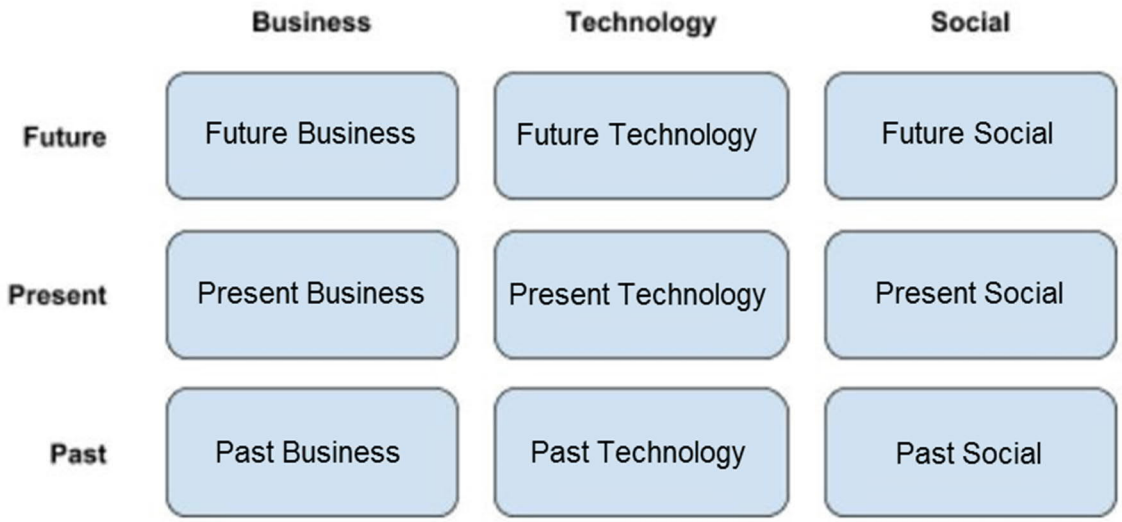

Figure 6. Business Transformation Map Nine-Field one-page view. (Naskali et al. 2018.)

The three vertical axis are business, technological and social maturities which include topics as follows (Naskali, discussion, 12.4.2017):

- Business factors; for example, current production processes, available resources, best practices found and workflows
- Technological factors like the technologies used, software and strategic planning
- Social factors including among others roles, transparency, values and norms and training.

The horizontal axis represents the time frames for past, present and future of which the past represents the decisions and factors which have lead up to the current situation. For instance on the social parameter, past could contain factor of a bad recruitment which has led to some problems currently. On the technological side, past review can show technologies that are not relevant anymore but which have resulted in a costly transformation process which affects the company currently. The present situation can bring the most actionable information and guide the stance that the company and its personnel have towards future. (Naskali, discussion, 12.4.2017; Naskali et al. 2018.)

The model is not and does not aim at being a maturity model but rather guidance and direction giving, and is intended to be used in non-structured interviews and discussions with or within companies. The test cases using the nine-field mapping provided good results as companies gained actionable understanding which guided following development projects. (Naskali et al. 2018.)

Stated above, the aim for the use of the Business Transformation Map Nine-Field is to help identify the status of a company currently and to guide or pinpoint the next logical and actionable steps for the company. The model takes a snapshot view of a company and aims at creating understanding for the stakeholders by showing which factors from the past affect the current situation, what are weak and strong points currently and what should the company strive for in the near future. Business, technology and social vertical axis forces the user of the tool to think many aspects of the business and shows dependencies between the three. The axis of social maturity contains many elements which can also be described as belonging to human and social capital of companies and take into account not only human motivation related factors but also, for example, prior, current and future networks and recruitment.

SME companies have many maturity models, methodologies, frameworks, tools and models available to them which they can use to identify their current business landscape. Some of these are highly theoretical, mainly academic, and/or complex to implement resulting in a requirement of specialist participation while some tools are easier to implement and use. Although most of the proposed solutions have had good results and have provided companies with insight to their business, the fact remains that all require some level of commitment and resources invested to them.

Regarding IT adoption, SME companies interested in improving their businesses with new IT solutions need knowledge and uncertainty mitigation. SME companies must be assured that the solution provided for them affect the desired target and that they gain some advantage using the solution and that the resources they take return back in some beneficial form. Resources include not only financial, but also skills and expertise in relation to digital (IT) solutions. If uncertainties or ambiguity are not addressed the attitudes towards IT solutions adoption will remain negative and investment in new IT is not made.

6 RESEARCH METHODOLOGY

The research methodology chosen to research IT adoption of SME companies is grounded theory which aims at discovering how parties involved handle problems. The methodology aims to formulate and reformulate prepositions until a theory is developed (Necessary knowledge to conduct research 2018).

Grounded Theory method is suitable for different kinds of qualitative data. It is sometimes referred to and called as data-driven research. Grounded theory practices have multiple different coding terms and practices which enables the researcher to conceptualize the phenomenon researched and formulate connections between the data and concepts. (University of Jyväskylä 2010.)

Grounded theory is a general research method and it enables the seeking out and conceptualisation of social patterns and structures of the area of interest. The process of constant comparison moves from an inductive approach to generate substantive codes from the data to deductive phase of theory development. The idea of grounded theory is that data gives suggestions on where to go next with the research and which data to collect, and, for example, which questions to ask if using an interview methodology. (Grounded Theory Online 2016.)

Grounded theory basic principles include categories which are identified by coding the data. Coding means that the researcher gives descriptive labels to data found issues which relate to the phenomena being researched. Researchers role thus to identify the categories and their relationships between each other. Grounded theory is the end product of this process and at the end an explanatory framework is produced with which the phenomena is to be understood with. (Willig 2013, 70-73.)

Grounded theory merges the processes of data collection and analysis and the researcher role is to revisit the data continuously with the aim to reach theoretical saturation which is the point where new instances of variation for existing categories have ceased to emerge. It is said that theoretical saturation functions as a goal rather than a reality. (Willig 2013, 70-73.)

Within this master thesis the initial theme was raised from media coverage stating that SME companies are not investing in IT and digital solutions and are lagging behind in digitalisation in EU and in Finland. This theme was formulated into the set research question; **'What are the IT and digital tools adoption affecting factors in SME environment?'**.

The initial theory before empirical interview and data analysis research is, according to the background literature, as follows: SME company IT and digital tools adoption is affected by resources of SME companies of which time, financials and expertise are the most affecting ones. SMEs are perceived to have limited amounts of these resources

which causes uncertainty and negative attitudes towards making investments in IT. Uncertainty and negative attitudes are seen by SME companies not taking action on IT investments. SME characteristics and uncertainties are basis for research categories.

There are many different maturity models, tools, frameworks and methodologies available for SME companies to use but they are often perceived as complex and difficult to establish and use. Outsourcing provides SMEs with opportunities to gain external expertise. However, they can be seen finances consuming and requiring trust. Trust is an impactful IT adoption affecting factor without which outsourcing relationships are unlikely to be built. Outsourcing belongs to the external relationships of SMEs. Outsourcing and different maturity models, tools, frameworks and methodologies stand out as categories as well.

Considering external relationships from a wider perspective including not only outsourced expertise entities but external networks with different stakeholders, it is seen that they can provide companies meaningful and impactful advantages. External relationships and networks are categorised to social capital of SMEs.

Internal relationships and capabilities, the human capital of SMEs, plays an imperative role in SME competitiveness. Human capital and understanding its value in SMEs enables them to draw from the internal expertise and skills in all projects including IT and digitalisation projects. Although human capital is readily available in SMEs, it would seem by the background literature that SMEs are not utilizing internal capabilities mapping practises. The internal and external relationships are joined to a category of social context.

The initial premise of SMEs not investing in digitalisation is the view of EU which is putting efforts to enabling IT and digital tools adoption through different funding instrument and initiatives. They provide SMEs with means to utilize IT and digital tools. Reviewing the impact of public support is selected as a category.

These background literature found factors are categorized to following below six categories which can be called the main categories of this research (Hirsjärvi and Hurme 2009, 47-49). With these categories the interview framework and questions to IT service providers and vendors are build with and with which their answers are reviewed against with.

1) Characteristics of SME companies
2) SME challenges and points of conduct where support or help is sought
3) SME engagement with consulting companies
4) Use of maturity models, tools, frameworks and methodologies in SME context
5) Social context in SMEs
6) Public support in SME digitalisation strives

In order to answering the research question, the methodologies chosen for this research are two-folded and two target audiences for researching the topic are selected; SME companies and IT service providers and vendors. The main methodology for collecting data

within this master thesis research is theme based semi-structured interviews with IT service providers or vendors who have SME companies as customers. The interview research is conducted for the purpose of generating more detailed and in-depth knowledge on IT adoption by including the viewpoints of IT service providers and vendors working with SME companies.

The second set of data comes from a research project called Inside the Box functioning at Work Informatics in Turku University, Turku School of Economics to which the writer of this master thesis belongs to as a working member. The data collected during that project is re-analysed for the purpose of this master thesis from the perspective of revealing IT adoption factors in SME companies. Both research methodologies are presented separately in following sub-chapters.

Grounded theory can share some features with phenomenological research and can focus on participants' individual experiences. This is more psychological in a way where the researcher is concerned with the structure of the internal world of the participant, for example their thoughts, feelings and beliefs rather than only social context, causes or consequences. This form is more 'from the inside out'. It is possible to combine grounded theory and phenomenological methodology in order to attempting to capture the lived experience of participants and to explain its quality in terms of wider social processes and their consequences. (Willig 2013, 77-78.)

Although grounded theory is the selected method for this master thesis research, a viewpoint from phenomenological methodology is also assumed to the extent of gaining insight to the lived experiences of IT service providers or vendors with SME companies.

The selected methodology for empirical research is semi-structured interviews. With the interview answers the aim is to draw a picture of daily lives and activities in SME company and IT service provider relations. The goal is to depict this entirety with the following:

- How the IT vendor/service providers see SME customers and the SME field regarding digitalisation and IT adoption, and decision-making,
- Does IT and digital tools adoption have relation to maturity models and other possible tools,
- What are the IT vendor/service provider's own processes in customer projects mainly in the initial stages of projects,
- How the IT vendor/service provider sees digitalisation in general regarding for example the EU's or Finland's efforts to increase it.

6.1 Semi-structured theme interviews

Hirsjärvi & Hurme (2010, 47-49) describe theme or focus interviews being semi-structured interviews to a target audience with a pre-set target as the interviewees are selected

based on their knowledge on a topic. These predefined topics or themes of the interview are raised by the researchers prior knowledge on certain topic by which the interview structure, framework, is built. The basic idea for conducting interviews with the focus group is to draw on the interviewees' experiences and interpretations on the selected and predefined themes. The interview planning stage follows grounded theory method and Hirsjärvi and Hurme (2010, 65-67), and it is built simultaneously with literature review by taking note of recurring issues and factors which play integral role in IT adoption according to the reviewed literature. The themes' setting is done after the literature review by grouping factors and sub-parts into main themes (categories). The questions are set to answer each factor or sub-part found.

In this master thesis, the themes (categories) for the interview are ones raised by the literature review which encompass the research towards answering the research question set. The literature brought six themes which describe different stages and takes multiple viewpoints on SME IT adoption factors from CEO/owner perspective to wider internal factors moving on to SME business external affecting factors including IT vendor – SME company relations and government and EU support factors. Among others emphasis is given also to internal and external networks. The full interview framework and questions are given below. The interview framework presents the themes, questions and some specific additional questions and examples which will guide the interview to assure reliability and validity of the research by ensure that all interviewees are discussing about the same phenomena. Although all set questions are asked during the interviews, the selected interview methodology is semi-structured and theme based. This methodology is chosen as it provides freedom in each interview instance and will enable new and unforeseen topics to emerge thus allowing more in-depth knowledge generation on the themes set.

The empirical evidence is thus collected through a qualitative research methodology. In order to gain insight to the SME related topics from Turku region IT vendors and service providers, a semi-structured interview method is selected. Interview is a flexible way of gaining knowledge on the topics at hand (Brewton & Millward 2001) and semi-structured, or semistandardized, interviews gives the interviewer permission to dive into more depth of the topics by adding supplementary questions during interview sessions (Berg, 2004).

The aim of the interview is to find answers to the topics raised by literature in a conversation-like open flow way. Semi-structured interview does this by allowing different order of questions and free wording of them in order to keep the interview fairly informal and conversational (Eriksson & Kovalainen 2008). Interview is a good methodology when the interviewee is wanted to have and given opportunity to bring his/her viewpoints as fully as possible, or when the respondents viewpoint are wanted to be input to a wider context, or when it's known that there will be multiple different answers or opinions to

the topics given, or when some given claims are expected to gain opinions and answers (Hirsjärvi, Remes & Sajavaara 2015).

The interviews are conducted with six (6) IT vendors and service providers in functioning in Turku region. The six are selected by the following criteria:

- The IT service provider or vendor must function in but not limited to Turku region
- The IT service provider or vendor must have but not limited to small and medium companies (SMEs) as customers or clients
- The IT service provider or vendor must have interaction with at least ten (10) customers or clients per year

The selection criteria above is set to ensure that all interviewed have accrued knowledge on SME businesses. There are multiple companies fitting into this criteria in Turku region and the search and selection of them was done through search engine inquiries after which they were contacted either by phone or e-mail for participation in the interviews. Due to business specific and customer information nature of the topics discussed in the interview, names of the IT vendors/service provider companies or the interviewees' names are not presented in this research. They are given identifying/separating initials (I1-I6) for comparing the answers and results. In the beginning results chapter a table is presented stating general IT company and relevant interview details.

6.1.1 Interview framework

The interview framework consists of question themes and topics which the selected literature review brought up. The interviews will give insight to SME company IT adoption topics from the IT service providers' perspective depicting the status and viewpoint of them in Turku region. Although semi-structured interview methodology is used within the interview allowing free structure and new topics to emerge, all interview sessions start by asking the interviewees two preliminary questions on **whether the company they represent have SME companies as customers (Q1)**, and **is the amount of SME customer companies they interact within a year is at least ten (Q2)**. The entire list of questions can be found from Appendix 1.

The interview questions firstly relate to the SME customer and their knowledge on their IT and/or digitalisation needs. **(Q3): Is there a definition of a typical customer and are they seeking certain services or do they know what their needs are?** This answers prior knowledge on recognizing needs SMEs have in regards to IT. Either they have or they are contacting the vendor/service provider after recognizing the need of digitalisation and IT in more upper level but not being able to specify or pinpoint the actual need. As presented by literature, limited resources regarding skills and expertise result in SME companies seeking outsourced support. Regarding outsourcing, the interview asks

(Q4): Can you describe on general terms in which situations SME companies seek help or support regarding IT acquisition or digitalisation? Uncertainties affect gravely IT adoption in SMEs by affecting the attitudes and perceived benefits companies can gain. To begin with inquiring on uncertainties the interviewees are asked **(Q5): Can you describe situations or reasons where/why customer companies present uncertainty?**.

With uncertainty, literature sprung issues of resource scarcity (time, money, human), uncertainty over project phases or results, and distrust in company internal relations or towards external entities. These are given as examples to get insight over the pinpointed uncertainty issues regarding Q5. The topic of uncertainty is continued by inquiring how does SME decision-makers perceive outsourced resources and consults today and has the vendor/service provider encountered situations where their proposed solution for the SME customer is questioning it and if these situations occur, how does the vendor alleviate or diminish the uncertainty. **(Q6): Have companies indicated uncertainty or distrust towards your company offered outsourced IT services?**, and **(Q7): Have you encountered situations where SME customer/client companies or representatives of them have expressed doubt or scepticism towards the solution your company has presented to them?**.

Literature on different IT adoption frameworks and methodologies brought attention to the importance of SME companies understanding their business processes. Through companies understanding their processes and possible deficiencies in them they are linked to recognizing the IT need in SMEs. The interview inquires the level of business process knowledge in SMEs. **(Q8): Are business processes clear in SME companies?**. IT service providers and vendors have a front-seat viewpoint in working with SMEs and their insight to the topic can give new information on the matter.

Literature suggested that recommendation and reputation play an integral role in SME IT service provider selection and to gain more insight to this, the interview asks **(Q9): How SME companies find your services and become your clients?**. The interviewees are given examples of acquiring clients by cold calling, client contact through recommendation by other customers or companies, and clients doing online searches. ‘Cold calling’, which is “a technique whereby a salesperson contacts individuals who have not previously expressed an interest in the products or services that are being offered” (Investopedia 2018).

SME decision-making processes and practices were described by literature as short-term, intuitive and without strategic planning. The interview asks whether decision-making in SMEs is perceived as such by IT service providers. **(Q10): Is there a typical decision-making process in SMEs?**. Again, examples are given to the interviewees; is the

decision-making process done by one person (CEO/owner), or, is there a group of stakeholders or steering group involved, or, is there a one person in charge assigned by the company owner or steering group.

Moving on methodologies and other review and analysis tools, literature showed that they can be beneficial to use in SMEs, and that SMEs need to understand the level or status of their business in order to gain the most success from IT adoption. The interview asks has the IT vendors seen that SME companies acquire reviews or analyses on their current level of business or technology or other prior to coming as a customer of the vendor. **(Q11): Have your customer or client companies conducted evaluations on business situations or levels prior to contacting you and becoming customers?**. This question answers will give insight to whether SMEs are taking steps to gain knowledge on their business prior to IT acquisition.

Literature opened the theme of company and employee knowledge to IT adoption being of great importance as knowledge and skills are the backbone from which the company can draw capabilities from. Knowledge mapping is an interesting internal environment issue. The interview inquires the experience of the IT service provider/vendor on whether SMEs have mapped out the knowledge of their staff. (**Q12): Do SME companies map out their employees knowhow? Is it documented somehow?**.

Related to knowledge, employee training is seen as key to improving the skills and capabilities of a company. The skilful staff in turn affect how easy it is to implement new solutions and start using them. The interview thus askes whether the SMEs educate or have practices of training the staff. **(Q13): By your own experience with SME companies, do companies train their employees or themselves?**.

As presented by literature, the human and social factors, like knowledge, skills and expertise above, are important to recognize in all companies. In regards to the SME internal environment the interview asks does the IT service providers/vendors recognize the social interactions within the SME customer company, does hierarchy and roles come apparent in customer dealings and have they encountered problems or challenges with internal roles and/or hierarchies. **(Q14): When you start performing a review on customer need, do you take the social aspect of the company into consideration?** It is explained that the social aspect includes hierarchies both within systems but also in human relations, and this not only means the work titles of persons but also their role in the company.

Maturity models help businesses to realise the current level and provide them with knowledge on what kinds of aspects they need to consider in order to elevate towards better functioning business. In relation to maturity models brought up by the literature the interview firstly asks are IT vendor/service providers acquainted with them and do they have maturity models or other business review models in their own use evaluating the level of business in general or in some specific manner. **(Q15): Do you use maturity**

models yourself for reviewing your company evaluation?. Secondly, regarding the use of maturity models, methodologies, tools and frameworks, the interviewees are asked do they use maturity models, standardized question sheets or other review methods to evaluate the current status of the customer company and the need or requirement the customer has. **(Q16): Are you using or have used maturity models to discover the customer/client company IT needs?**.

By literature SMEs many times function in task-oriented way in a fast paced environment leaving the overall picture of the company status many times somewhat vague. In relation to this, the research interview asks what are the IT vendor/service providers' methods or ways of mapping out the customer need when a new customer relationship is in the initial stages. **(Q17): When a new customer project begins, what are the ways or methods used for idenfying the customer need?**. Additionally, it is also found out what are the IT vendors' viewpoints on SME using maturity models. Literature suggested that maturity models are designed mostly to large corporations and that SMEs does not have the time or other resources to implement or follow heavy and often complex maturity models. **(Q18): What is your general opinion on using maturity models in SMEs?**.

The last two interview questions brings the interview session to a close with more general topics on digitalisation. Literature and other sources presented in the beginning of the literature review that EU and Finland are putting efforts in SME digitalisation with funding different schemes or initiatives directly and indirectly aimed to increasing SME sector digitalisation. The interview asks what are, in the IT service providers or vendors' view, the best way to digitize SME companies and is it good that the public sector supports SMEs in it or should the incentive come from the market, from IT vendors and service providers. **(Q19): When talking about increasing the level of digitalisation in the SME field, what should be done for it?** It is explained to the interviewees that, for example, from governmental level there are incentives provided for SMEs, like the innovation voucher granted by Tekes (now Business Finland).

Regarding the financial issues of SMEs, literature presented the rise of pay-per-use trend in recent years. This has lowered barriers to start using different solutions and systems as initial investments are no longer required. The last interview question asks whether IT service providers have witnessed the trend and what are their thoughts on it. **(Q20): Have you witnessed the trend of pay-per-use payment methodology and has it changed the way SME companies are investing in IT?** The entire list of questions can be found from Appendix 1.

6.1.2 Interview analysis

The analysis of the interview results is done through transcribing the interviews and analysing them. The interviews were recorded for analysis and after conducting interviews, the collected material is reviewed and organized for analysis which is done by transcribing the recordings on theme (category) basis on issues raised by literature review. Theme based transcribing describes transcribing made selectively according to pre-set, literature found interview themes (Hirsjärvi, Remes & Sajavaara 2015).

Hirsjärvi and Hurme (2010, 173) describe thematising as a process in which the interview risen factors are thematised into the research which are based on the interpretation of data by the researcher. Analysis thus also permits new themes to rise from the interviews as the targeted interviewees are experts on the field and may provide additional information or at least give insight to how the literature found issues and factors present themselves in concrete business world.

The analysis will focus on what issues and factors raised by literature review are supported by the interviews. The main way of presenting the results is through narrative descriptions of each question answer; what was stated by each interviewee to the same topic under pre-set theme.

Reliability and validity of the research is reviewed through giving the same specific questions and additional examples to each interviewee to ensure that all participants are talking and thinking about the same issue. Validity is also approached through giving anonymity to interviewees allowing them to describe their experiences with SME customer companies IT adoption which will allow more upfront and valid information as the interviewees are presenting their views in an environment of trust enabled by anonymity. Validity of the interviews and research will be evaluated through given detailed information with information on all possible disturbances and distractions, and by giving reflective research evaluation. Reliability and validity of the research is evaluated in chapter 7.4.

6.2 Research project collected data

The second set of data comes from Inside the Box research project to which the writer of this master thesis belongs to as a working member. The research project's goal is to research digitalisation in SMEs, construct methods that lead to digitalisation and to improve the level of digitalisation in SME companies. The research project has used the Business Transformation Map Nine-Field model in discussions and interviews with project test companies in order to create visual understanding to SME companies on their current

business situations and in order to test the usability and feasibility of the model with real company cases. The model is presented in chapter 5.3.

The approach taken with SME companies is the suggested by the models authors where the aim is to open up a dialogue through interviews which follows the structure of the model addressing each topic of the nine-field map; past, present and future aspects of business, technology and social factors and giving plusses and minuses to each factor indicating weaknesses and string points in the company in question (Naskali et al. 2018).

From a wider perspective the methodology assumed with data collection is action research as during each company case, the aim is to improve the digitalisation of the company through and in collaboration with the company. Each company case is an improvement project where there is a goal set which regards digitalisation in some form or another. According to Drouin, Müller and Sankaran (2013, 177) action research is defined as seeking to bring together action and reflection, theory and practise, in participation with others in pursuit of practical solutions to people concerned, and that action research is a flexible process which allows action to change, improve and research topics of understanding and knowledge which are achieved at the same time.

Looking action research more in depth, the methodology in question is participatory action research which is characterized by researcher participating in the development or change process with the research target entity. Action researcher role is more like a consultant who is an active participant guiding procedures, not dictating them. Role of the researcher can also be characterised as outside change process observer and evaluator who at the same time of active participation documents the change processes. Key feature of action researcher's role is to actively seek and develop practical solutions and approaches for the participating research target. (Hirsjärvi, Remes & Sajavaara 2009, 70-72.)

During the research projects company cases, each company receives an action plan or other practical guide or solution for the purpose of improving their business with the help of digital tools. Action research is applicable and well-suited methodology to be used with Business Transformation Nine-Field as Naskali et al. (2018) suggest that it is to be used as a note-taking or support tool in discussions and collaboration with companies which results in a visual map of current business status.

6.2.1 Analysis of company cases using Business Transformation Map Nine-Field data

For the purpose of this master thesis research six (6) SME company cases are used to analyse the IT and digital tools adoption factors. Each company case is analysed and reviewed with the lens of 'IT adoption affecting factors'.

The data for this analysis comes from the conducted Business Transformation Map Nine-Fields which are collected during Inside the Box research project at Work Informatics in Turku University, Turku School of Economics. The Nine-Field maps information have been collected in company case projects during the year 2017 with the companies.

The case analysis is done through narrative description of each company project which depicts the cases and targets of each company case project and their results. Emphasis is put on finding out the adoption related factors regarding the decision-maker;

- attitudes and motivation,
- company resources,
- uncertainties, and
- other company specific factors.

The analysis combines the findings together and at conclusions chapter combines the results together with literature found factors and interview study results. The companies are given anonymity and their names and identifying features are not given in this master thesis which is a public document. Validity and reliability are reviewed after the research is conducted.

7 RESEARCH RESULTS

7.1 Interview study

There were six focus interviews conducted with IT service providers and vendors. As described by the interview framework, the first two questions aimed at identifying the interviewed and the companies they represent. All interviewed have SME companies as customers (Q1) and all have at least ten SME customers per year (Q2). The second question's answers ensure that all interviewed have experience from various SME companies per year and their viewpoints come from multiple occasions dealing with SMEs. The interviews were made in Finnish and then transcribed after which they were translated into English. Table 2 below shows more details on the interviewed persons and the companies they represent.

Interviewed company	Business Field	Established	Number of employees	Interviewee role in company	Interview duration (hh:mm:ss)
I1	IT consulting services specialized in information security	2010	8+	Account Manager	00:46:50
I2	IT consulting, system and software development, import, export	1992	45	Sales Manager (IT)	00:49:50
I3	Digital marketing	2015	8	Web developer	00:47:20
I4	ICT infrastructure solutions sales, implementation and consulting	2002	10	CEO	00:46:00
I5	Software design and development	2011	1	CEO-owner	01:08:20
I6	Software design and development, and equipment sales	2015	19	CEO	00:37:00

Table 2 Interview and interviewee details.

Table 2 above shows that the IT companies (the SME service providers and vendors) have different IT business niches or specific IT business focus points. This lets us assume that the companies firstly represent a vast IT background and provide information on SME IT adoption with varying viewpoints. Because SME companies are from variety of business fields, the variety on IT service providers can give this research varying viewpoints enriching the results. The size of the IT companies, from which the interviewed are representatives of, also changes from one person (sole entrepreneur) to 45 employees. This brings variety of insight to results as well as the experiences shared with the interviews stems from different IT company structures and ways of working.

7.2 Interview results

7.2.1 SME characteristics in relation to IT or digitalisation projects/purchases

Question 3 "Is there a typical customer?" (Q3) presents the very first steps taken together by the customer company and IT vendor or service provider. It is common that SME companies make contact with IT-companies with some need or requirement in their mind. All interviewees state that customer companies cannot be grouped into one or two categories and they are always their own standalone cases that need to be addressed with a single solution or way of dealing. The sole unifying factor with these companies is that they all seek solution to their needs from IT or digital solutions but according to I6 lack the means to use them themselves. The usual factor is that, the customer company representative thinks he/she knows the real need or requirement (I2, I3, I5 and I6) and contacts the IT vendor or service provider based on that specific need. Interviewee 2 states that the initial need or requirement is basically the discussion opening for the entire project and leads to discovering the true needs of the company. It is most common that the project scope expands during the project as these true needs or underlying shortcomings of the company are discovered (I2, I3, I5 and I6). The initial specified needs and requirements tend to be concrete in nature, for instance, ensuring company information security (I1) or making the company web pages better (I2, I3).

Theory described the decision-making processes within SME companies and stated that most SMEs function with a small number of decision-makers, these usually being the owners of the company. The interviewees agreed with theory and stated the same when asked about SME decision-making (Q10). Most commonly in small companies the decisions are made by one person (I1-I6) and that this decision maker is usually the company CEO/owner (I2-I4, I6). As the company size comes larger, the more structured it will come by adding employees with specific responsibilities such as IT. I2 states that the

growth stage of a SME where it needs to hire or assign someone to be responsible of IT, is around 50 employees and I4 states that companies over about 30 employees usually has someone given responsibility over IT. Two interviewees (I2, I4) described decision-maker as a person who is not specialized in IT. This can cause frustration and anxiety to both, the decision maker as he/she feels alone with the decisions needed to be made (I2), or to the employees doing their work with the IT as the decisions are made by the CEO without asking opinions (I4).

Question 8 (Q8) asked IT-companies what is their knowledge on SME customer companies having understanding on their own business processes and whether these are documented on not. All interviewees (I1-I6) state that business processes are not clear within the customer companies and lack wholesome process documentation. The interviewees claim this being due to the nature of SME business; many SME companies function on a day-by-day basis where business runs smoothly without separate process documentation (I6), companies have their business idea which sells without needing to know how specifically the selling process is done (I2), or there is not value seen in using resources on documentation creation (I1). One interviewee agrees with SME decision-makers (I6) on that there is no need of having documentation in daily business life and that documentation is needed only when larger changes are affecting the business, for example, if the company is hiring a large amount of new employees and they all need to be trained.

The negative side of not having business processes documented is seen by all interviewees as well. Interviewee I6 states that, if documentation exists, it most likely does not represent reality as employees have their own accustomed ways of handling their tasks and that missing documentation slows down IT-projects with IT-vendors and IT service providers. This increases work as the SME – IT-vendor/service provider negotiations and interviews take more time and meeting occasions. Other negative issues from missing process documentation are also presented. I2 describes that SME companies start to need process documentation when they have 20 employees or more or business cannot be run efficiently and I3 has seen that missing documentation leads to different departments or sections of the business not having relation with each other and even working against each other. Interviewee 4 (I4) states that a comprehensive cost-effective way of thinking is completely missing from SME companies and that these companies live in daily manner seeking and buying solutions from varying sources which leads to miscellaneous business big picture difficult to understand which leads to difficulties on finding the issues resulting in errors or to develop.

A positive attitude towards process documentation by SME companies has been lately seen by two interviewees (I2 and I4). Interviewee 2 (I2) sees a trend of businesses starting to participate in various kinds of business accelerators where businesses are trained on using different models of documentation for the purpose of developing their businesses.

Interviewee 4 (I4) has seen a lot of positive movement towards defining and manufacturing business and IT documentation in the past three years. He claims that this is because of companies in recent years have had to have someone to deal with IT. There is no longer companies that are not using IT or digital tools in their business.

7.2.2 Way of attaining customers

In addition to small and medium sized companies seeking IT companies, vendors and service providers, to solve their IT and digital related problems and creating cooperative projects, IT companies actively pursue new SME company customers. Question 9 (Q9) asked which ways IT companies search for new customers and whether they belong to networks or recommend other IT businesses in the region. All interviewees (I1-I6) stated that they had used cold calling as part of their activities to attain new company customers. Five respondents use the technique to get new service customers and one (I6) stated that their company used it for speeding up sales of one specific product. Most of the interviewees commented cold calling being resource-taking without any guarantees of gaining new customers. Interviewee 1 (I1) had most positive attitude towards the technique and opened the issue of their special field in information security which almost always interests potential customer companies to know more on.

The IT vendors/service providers interviewed described other ways of attaining customer interest. Networking with other IT companies in the region is seen as a positive trend and recommending potential customers to make contact with another IT vendor/service provider over all business growing. Recommendation takes place when the company core business and focus within IT is on some other field than the customer need. Recommending is done due to the fact that no one (company) can provide for all different IT needs (I2-I6). Interviewee 1 (I1) agrees with this as well but adds that the company itself has no competition in the region and makes it easier for them to recommend and be recommended. I5 and I6 state that recommendation happens mainly through IT companies recommending each other rather than IT company customers recommending IT companies to other potential customers.

Five interviewees (I1, I2, I4-I6) tell that they belong to one or more networks of IT companies and all see networking as key to attracting more business. Out of the interviewed, company 2 (I2) is the most networked by interviewee naming three networks the company belongs to. I2 describes one network being of nearly 100 companies and that it was established because small companies were neglected in public (Finnish state) competitive tendering processes due to their small size. With the network, small sized companies could and can join in co-operations to compete with large scale IT companies like, for example CGI (I2). Although established for this reason, the network has since started

to provide customers to other companies in the network as well. I4 also opens the networking effect more by stating that networking is ever more important today as companies and the entire business field is getting more fractured. According to him fractured business field means that companies are taking different services and products for their use from various sources which leads to businesses more difficult to understand or grasp the big picture of their business or the business solutions they are using. Networking between IT companies brings understanding to IT experts which can then help customer companies grasping that bigger picture.

7.2.3 Perceived challenges and points of seeking outsourced support

Question 4 (Q4) asked what are the in general points of cooperative projects where SME companies are seeking support from IT companies. As we saw by answers above (Q10), SME companies tend to lack skills and expertise in understanding the comprehensive big picture of their business and IT and this perception gets support from all interviewees (I1-I6) and SME companies insecurity towards understanding their business from all aspects needs IT company support.

The support from IT vendor/service provider has to do with creating the overall value statement of the company to its owners and stakeholders (I1), bringing knowledge on the issues needing of development (I2), creating a business form where the products and/or services of the company is supported by its functions (I3), creating a wholesome picture of the IT infrastructure which aimed at supporting business functions (I4), providing expertise on best fitting tools and information on what needs to be better controlled (I5). I6 states that SME businesses IT deployment is the single most support needing point by the reason that the non-experts in IT are not able to articulate their IT problems via phone or later after the problem has occurred. I1 and I2 also describe their support being internal purchase supporting by that many times the person named responsible over IT in the SME wants support on justifying the need of some IT solution to the SME company decision-maker. The value of an investment needs to be presented thoroughly in order for owner-stakeholders to make informed decisions (I1). Frustration over IT project phases and, for example time frame, is a SME characteristic which is more easily tackled using agile development methodologies with which the decision-makers get to see partial development goals reached instead of traditional methodologies (I2).

Digging deeper into SME company uncertainties, the IT vendor/service providers were asked in which situations and in relation to which theme SMEs present themselves uncertain during an IT project with them (Q5). The interviewees were given four example themes to which they could add other uncertainties they perceived most commonly to encounter. The four example themes were 1) Lack of resources (time, money,

knowledge), 2) Uncertainty over project phases and/or results, 3) Lack of trust toward the solution internally, and 4) Lack of trust in outsourced IT vendor/service provider solution. All the interviewees emphasized the need to present the concrete and total value of the project to, not only to the IT specialists but to the decision-makers of SMEs (I1-I6). I2 states that uncertainty is common as IT projects are often abstract in nature where many times the viewable result is, for example, a mere basic website. The SME decision-makers need to be made aware of the value which is on the background which could, as an example, be the well-established IT infrastructure for future growth. I6 also discusses the abstract nature of IT and he sees the total benefit as difficult to describe to the customers. He states that the single biggest problem is the fact that no one can, with 100% certainty, explain the total benefit before it realizes for the company. The total benefits is related to money resource of SMEs which is the single most named uncertainty creating factor. Out of the resources, money is the most uncertainty creating, which is named by all interviewees (I1-I6).

Regarding trust on a general level IT vendors/service providers have encountered trust related issues in many ways. I2 states that many SME companies and the entrepreneurs have uncertainties and even fear of IT and digitalisation and that turning digital means that IT projects result at company needing to lay off some of their employees. He continues that this of course is not the case or strived for. The aim is at efficiency by referring the freed resources to new tasks and work, and rather to increase volume. The fear of layoffs can occur also by employees, and interviewee 4 (I4) describes sometimes seen situation were the CEO/owner has made an IT related decision based on cost-efficiency and not taking into account company current IT. This has led to scares by people working on the company IT fearing for the future of their jobs. This is in relation to above handled question 6 (Q10) on decision-making processes. When IT companies contact the CEO/owner with cost and financial marketing, the result can be company employee frustrating, if not taken into account.

According to I4 and I5 SME companies sometimes doubt IT vendors/service providers ability to handle (I4) or question the size of the IT company, readiness or reliability to respond to the need of the customer (I5). The answer to tackle the uncertainties and fears is to describe the to-be gained value clearly (I1, I3), to handle reporting well and often (I2), to handle the agreement terms thoroughly (I4), and to handle the over all tendering/negotiation phase with great detail (I4-I6).

7.2.4 Attitudes towards external consultants

All interviewees agree that there is some doubt or uncertainty against external consultants (Q6). The reputation of consultants was bad during the 1990s but has become better

since then (I4). The term ‘consultant’ is still something to be avoided (I4, I5) as it has deep rooted understadings among many (I5). Today, external consultants are used, not to business development which is seen needed to be done by the business itself but to have expertise on some specific, special knowledge demanding tasks (I1). External consulting is widely used by companies (I3) and consultants and external experts are taken to add to their own inhouse know-how to cover the knowledge and expertise lacking (I2).

Question 7 (Q7) wanted to make more profound understanding about the uncertainties SME companies have towards the solution proposals given by the IT vendors/service providers and, in turn, what kinds of techniques or ways the IT vendors/service providers have to tackle the attitudes or uncertainties. Interviewee 1 (I1) has not seen uncertainties towards the solution proposals they offer for customers and accredit it to their way of creating well-argued and all needs covering solution packages. All other interviewed stated they had seen doubts and uncertainty (I2-I6). The cost structure or expenses is one factor causing concern, and I2 has seen this with agile methodology projects during which a pinpointed sum or expense is not stated and the project is given a certain total expense range. I3 also states that the expenses often need clarity when defined and the evaluated expenses need to be reported duly to keep the customer satisfied with the progress of cooperation.

Uncertainties can cause stagnation or halt for the entire project, and a situation where the customer company does not respond to questions from IT vendor/service provider (I4). According to I5, quite often companies think that their business field or product is so specialized or exceptional that digitalisation (at least in regular terms) cannot help their business. The interviewees state that the key to unwrap and to handle uncertainties is clarity and being straightforward (I1-I6). Additional discussion topic to Q7 were the types of resources which reveal and overcome uncertainties in IT projects. To this I1 emphasized the need to begin all projects with comprehensive project descriptions which leave as little as possible amount of questions, I2-I4 and I6 raise the need to have many face-to-face meetings. The IT vendor/service provider’s project manager is responsible over his/her sales and IT project from the beginning and it is the project manager’s job to communicate with the company on a weekly basis (I2). When uncertainties or doubt occurs, the cost structure needs to be reviewed and the project reassessed by negotiations which may lead to narrowing or more rarely, widening the project scope (I3). The projects which have come to a halt need to be reassessed from project beginning and key is to gain knowledge on reasons for this reluctance (I4). The best way is to have a face-to-face meeting and to have an honest discussion which is valued by companies in Finland (I6). I5 points out that finding out the uncertainty might not always be difficult and resource-taking as many times they come out in a single phone call to the customer company.

7.2.5 The use of maturity models and other tools

Question 17 (Q17) sought insight to customer requirements mapping when a new customer company project is started. The cooperative project initial stages are important according to all interviewees and all emphasize the case by case nature of communicating with new companies as customer situations and business fields are different (I1-I6). Regarding readymade tools and questionnaires with which IT vendors/service providers can map out the need and requirements, four IT service providers use them (I1-I3, I6).

I1 company uses readymade, Finnish government provided, information security questionnaires with their customers which they customize to different needs. I2 does the same and explains that these questionnaires can provide extra information on what are the underlying conditions and requirements of the company. The company is planning to release its own constructed and customized questionnaire in near future (I2). The special business fields of the interviewed companies comes into the picture in regards to the question as I3 uses visualization charting as they tool which is justified by their business field in digital marketing and website building. Interviewed company 6 (I6) uses preliminary questionnaires to give an estimation of expenses to the customer company. An opposite view to using questionnaires comes from I4 and I5 by both stating that formal questionnaires do not give profound answers as potential customer companies have vast differences in their fields, products and ways of working. Although I6 uses preliminary questionnaires and their use provide good insight, he also recognizes that these can cause resource-taking which can be avoided, and can many times give out information which is irrelevant for the cooperative project at hand (I6).

In theory part we saw that maturity models are aimed for companies to follow in order to develop the various aspects in their business given as steps or phases of the maturity model. However, maturity models are not generally used by IT vendors/service providers to map out the development or requirements of the customer company (Q16). I1, working in the field of information security has seen companies wanting to tie their business functions to some information security quality management methodology, and gives an example of ISO9001 standard to which companies many times combine some unified information security criteria.

I2 stated that the company takes elements from multiple methodologies and applies best fitting to gain best outcomes in projects and that if the company has a methodology or framework they follow that is of course followed in the project. Interviewees I3-I6 describe that they are not using any maturity models or methodologies with their customer companies as the models and methodologies in their view are designed for larger-size companies.

The issue of maturity models and other tools use is taken a deeper look with three specifying questions. Question 11 (Q11) asks whether SME (customer) companies have

frameworks, maturity models, techniques or tools in use prior to making contact, and that the reason for contacting is that these would have stated the need to develop or upgrade some part of their business. Three interviewees say that only few of their customers have development models they follow, and that occasionally the reason behind contacting can be negative results with these models (I1), and that the use of models and following frameworks has become a growing trend recently with SMEs (I2). I6 has seen that companies willing to take total control over their companies and understanding the processes tend to start using different models. On contrary, I5 sees that the reason for contacting is a found deficiency in business not an outcome of a maturity model or other tool. I3 and I4 have not seen the described use of tools at all with their customers.

The same result as above with SME companies was identified with IT vendors/service providers own business functions, and they do not use maturity models with their business activities (Q15). I1 company's business field is information security and the representative states that being a topic which requires following many standards and frameworks. I1 is an exception among others interviewed. I2 has followed PMI (PMBOK) methodology but is leaning more to agile methodologies from various sources, not using one certain model or framework. The other interviewed companies (I3-I6) are not using any official methodologies. Reasons for this are the view that small sized, compact, companies do not need them as everyone knows everyone in the business (I3), that following new technologies does not need framework set up by the company (I4). I5 says that the models take too much resources to set up. I6 is not using models or tools either but state the company having a way of working where an employee is always put to research new technologies as they come to market to review whether they should be taken into their product line or get covered by their own solutions.

Question 18 (Q18) examined how IT vendors/service providers see maturity models, are they needed and what they perceive as challenges with using them. Five interviewees say that maturity models are good to have, and they could provide good information and companies can benefit from using them (I1, I2, I4-I6). I3 does not see maturity models beneficial for small sized companies. Two interviewees gave rationale behind supporting the use of maturity models one being the fact that no development can be made without analysing current situation and it is good to know the status of the business functions (I1, I5). Although five stated maturity models use having positive effects, four of them present current maturity models many times being difficult to implement by small companies (I2, I4-I6) and continue that in order to successfully implement and use a maturity model it has to be lightweight which means that the model needs to be fitting to small-size company use. The model should not be too much resource-taking (I5) or it should not take too much over specification (I6).

7.2.6 Social context in SMEs

Regarding the social side within SMEs, all interviewed IT service providers agree that there are hierarchies or employee roles which affect joint projects and that these hierarchies are visible (I1-I4) or hidden (I5-I6) to the IT company/service provider (Q14). Visible hierarchies and people within them are more easily addressed than the hidden ones. Five out of six interviewees (I1-I5) have encountered hidden hierarchies or hidden agents having a say or influence over projects with customer companies, I6 recognizes the issue and stated that most likely they exist and have affected in the hidden, invisible, way to them. I1-I4 stated that they map out social hierarchies in new customer companies, out of one (I2) does this actively by trying to find out who has the rank in the company and who/whom are the people having effect on the decision-makers decision-making. I1 realizes that in companies and in SMEs especially the job titles of employees can describe completely different thing than the actual work they're doing, and in I1's view there are persons characterized as champions in companies who are making the decisions, and persons who influence the decision by giving or refusing support.

I3 describes the process as trying to find the people or employees who are not part of the project team but have or can have a say in its course. These people have experience and understanding on issues and topics of the project at hand. In comparison with previous, I4 sees that employees having a say in the project or development case need to be located from within the company, but he also states that IT development projects need to be started or initiated from the top most level of the company. This is imperative as in his view it is impossible to get company top managers involved if the project has started at a lower level initially and that in development projects there is one named project leader from the customer company who is the contact person for the entire project. I5 sees these hidden agents as a frustrating phenomenon as sometimes negotiations can continue rather long whilst the decision not to pursue the project is already made by the hidden agent.

Regarding having tools or methods for identifying social hierarchies or hidden agents in SME customer companies the interviewees have none in use (I1-I6) and this is seen mainly as a sub task done almost unconscientiously in one's head without a process (I3) or on the rough level (I4). I1 states that recognizing hierarchies and finding out possible hidden agents should be done more and in a process like way. I2 and I5 have experienced that these agents appear to only one or two meetings during the project and they try to catch these persons role then.

7.2.7 SMEs mapping out internal knowledge and employee training

Question 12 (Q12) explored whether, in IT service provider view, SME companies map the knowhow or knowledge of employees. Regarding IT knowledge mapping the interviewees I1, I2, I5 and I6 have seen that companies are divided by some excelling in knowledge mapping and some not doing it at all. Asking an evaluation on ratio between companies mapping IT knowledge and not, only two interviewees give answer, and according to I5 and I6 the ratio is completely 50/50: some do it and some do not. I3 stated that this issue does not come to his attention during customer projects, and I4 states that companies are not performing knowledge mapping almost at all. Interviewee I1's answer is grounded on company's special business field (information security) and states that people need to have up-to-date information on every day basis, and it is required for companies to have their IT and IS security knowledge mapped out. However, I1 continues, this is not the case many times which leads customer companies seeking outsourced expertise.

I2 and I4 see company knowledge mapping as something done very little or not at all as it is something company management does not understand or want to put resources on. Both interviewees see that knowledge or knowhow is presented to companies through the expressed points of interest by employees. These come present often during unofficial discussions like coffee breaks (I2), and the unofficial IT expert becomes support for other employees (I4). I4 and I6 have the view that in small, under 50 employee companies separate knowledge mapping is not needed as all employees and top management know each other.

Moving on from SME knowledge mapping to employee training, question 13 (Q13) asked how IT companies sees SME customer companies training their employees. Like above in relation to knowledge mapping, I5 and I6 view this as almost like 50/50 situation where some companies see value in training and other view it as extra cost. I6 describes that especially with new technologies, employee training is in child shoes. I5 experience of training is that only one person in a company goes through training and it left as the responsibility of that one person to distribute the knowledge on to the company. This view is supported by I3 who sees that the usual way is to send an information package of the development or project is sent to the contact person who is then responsible of viewing it with others in the organization or company. I2 sees that traditional companies such as industrial companies are not training at all but in IT field exemplary companies currently having a foot hold in media (currently in Finland: Vincit Oy and Siili) are leading the way by presenting the importance of employee training to other companies. I4 on the other hand sees bringing the importance to train to limelight problematic and states that while the level of training in companies is divided between the ones that train and the ones that do not, there can be too much efforts put to emphasizing employee training. He argues

this by stating that there are different needs in different companies and that employee training is not needed in some companies.

Regarding challenges of training, I4 and I6 give examples; I4 sees that the challenge is change resistance presented by employees. This resistance comes apparent in training sessions as attitudes and as opposition towards the change occurred in organization. In discussions with company CEOs, I6 has learned that employee training and the contents of it need be tailored and tight to specific company's needs directly, and while he agrees with this requirement, he adds that the result is a tailored and specific made training coming at a higher cost than generic level training which in turn leads to companies not investing to it at all. The challenge is thus to make the training package as concrete and as specific as possible to resemble the actual need of the company with lower cost (I6).

7.2.8 Public (government) support for SME digitalisation and the pay-per-use phenomenon

The interviewed were asked upon were their views on governmental and/or public support towards SME digitalisation (Q19). After this open and rather vast scale question, the example of Tekes innovation voucher was given to them and asked how they viewed it as one example of many forms of government support. Digitalisation is seen as a difficult or problematic term by three interviewees. It is perceived as a big term holding many definitions (I1) which is not always in line with the IT service provider's definition or view (I5). The term is too much of a general term much like IoT which currently everyone wants but which inevitably does not resolve or respond with the actual needs of companies (I6).

All interviewees see government and public support towards SME digitalisation as something having both positive and negative aspects. On positive side government and public support is seen as boosting business (I1, I2) by giving 'injections' to specific improvements (I4, I5). Government support can provide the needed starting point without which new things cannot be produced (I3) and that this kind of support has its place and it can help SMEs better their IT (I6).

Acknowledging the positive side requires addressing the negative impacts as well. Government or public support can distort markets is a view stated by five interviewees (I1-I5). The positive seen 'injections' of funds have the down side that is the unknown effect after the one-time-type funding ends (I4, I5). The distort can occur by bringing support only to some specific field within IT or digitalisation (I2), the support itself can end up funding some wrong, non-productive companies (I3) or companies which know how to use government provided funding instruments in their benefit by creating new

consulting business aimed at only using the SME support granted by government or public entities (I1, I4, I5).

To the given example of the innovation voucher provided by Tekes (now: Business Finland) to enhance innovation in business was known by all interviewees beforehand. Four interviewees gave following comments and responses; I1, I4 and I5 see the innovation voucher as an example of instruments which can create consulting business aimed at only using the voucher amount of money SMEs have received. I5 gives detail to his view by stating that the voucher is inadequate as it supports only innovation not concrete business development. I6 on the other hand points out that the innovation voucher is not well-enough known by companies and that the voucher description stating internationalisation goals of the applying SME can be repelling.

Additionally, the interviewees were asked what should be done to increase the level of digitalisation in SMEs in Finland and in Turku region. The answers varied from responsibility being the SMEs to the responsibility of own services marketing. The willingness to increase digitalisation needs to rise from the SMEs themselves (I1, I3) and through demand and supply (I4). It can be supported by presenting good examples and especially by presenting the benefits of digitalisation (I1, I4 and I6). I2 told an example story of a company worrying about needing to let go employees from their warehouse unit as they launched an online shop. The (I2) IT-company needed to assure the entrepreneur that he wouldn't be needed to do that, and that the repercussion would be to work force reallocation. I2 continues that stories like this should be emphasized and put forward to increase SME digitalisation willingness.

In addition to willingness from within the SMEs, I3 sees that IT-companies need to market and promote their solutions much more than they currently do. Instead of the innovation voucher, a well marketed 'digitalisation voucher' needs to be presented to companies (I5).

7.2.9 Pay-per-use payment methodology

Literature review on IT monetary factors brought up the rise of pay-per-use payment methodology, and all interviewees (I1-I6) state witnessing its arrival to IT services business (Q20). Pay-per-use is a trend now which has and is coming with great volume (I3, I5), and has resulted in losing a client because his company is not offering services to be paid on a month-by-month basis, but is currently thinking of changing the payment methodology to pay-per-use (I5). (IT) companies need to constantly think and rethink financial models because new sources of income are needed (I1), and pay-per-use payments provide fixed income and steady cash flow (I4, I6). Pay-per-use frees companies from maintenance costs (I2) and pushes the initial costs down to a zero or at least low (I1, I4-

I6). None of the IT service providers/companies have experienced challenges with pay-per-use payment methodology but, when asked, I1, I2, I4-I6 state that it is possible for companies to accrue multiple low cost IT services and not to use the services fully. I3 states that accruing overlapping pay-per-use services is possible due to low costs and easy setups by SMEs. However, I2, I4 and I6 have noticed that customer companies want to have shorter service termination times and name pay-per-use as the reason for this.

7.3 SME company IT adoption factor analysis through Business Transformation Map Nine-Field Model

There are six (6) company cases' data used to find out the factors affecting IT and digital tools adoption. The data was presented in Business Transformation Map Nine-Fields which present each SME companies current situation through business, technology and social factors. The information in each case has been obtained through interviewing the target company owner-manager. The companies have been customer companies to Inside the Box research project during year 2017 and the interviews are conducted with the research project team. The six SME companies are presented in below table 3 after which the company development cases are presented in table 3. The information regarding table 4 comes from internal case memos by the research project's research team (Ahtosalo, Jaakola & Matintupa, case notes, 2017.)

The analysis of SME company IT and digital tools adoption factors was conducted by reviewing the Nine-Field maps and pinpointing the affecting factors. Each company's own full Nine-Field map can be found from appendices (Appendix 2). They have been translated from Finnish to English by the author of this master thesis.

Company	Business field	Established (year)	Number of employees
C1	Building construction products, product procurement services and consulting	2014	1
C2	Wellness and wellbeing consulting and educating	2016	3
C3	Manufacture of cleaning products and utilities, sales, marketing and research and development	1990	~65
C4	Building plumbing, ventilation, electricity and automation installation, design, consultation and equipment sales	1999	~20
C5	Car rental, moving and transportation services and additional services attached to them	2010	1

C6	Demanding cleaning and cleansing of buildings, specialized in micro-bio cleansing	2010 (reg. 2013)	~20

Table 3. Case companies analyzed with Business Transformation Nine-Field Map.

Com-pany	Initial case target / goal	Did the customer company have spe-cific tar-get or goal prior to the project?	What was developed or performed with / for the company?	Possible change factors during the initiated project (after launching project):
C1	To gain knowledge on end-user opinions and viewpoints and enable faster, transparent and re-liable decision-making	No	End-customer survey for multiple case use, test survey and analysis of results with analysis tool for future use. Compari-son of project manage-ment software and tools and recommendations to select	Customer wanted to change project goal to seeking auto-mated and AI supported project management and de-cision-making support sys-tems / software.
C2	To have a better functioning and cost-efficient online course plat-form and to gain insight on possible target markets	Yes	Market research, ideation / feature list to develop a mobile app for company and to review mobile app development offer for company	Funding for development from Centre for Economic Development, Transport and the Environment (ELY cen-tre) to develop business
C3	To reduce the use of pen and paper reporting by em-ployees, to enable better corporate reporting, to make manufacture trace-ability digital for faster access and	Yes	A report on current busi-ness situation, the main factors which should be next digitalized in the current IT/ICT environ-ment with multiple ERP systems. Report pro-posed an investment in a	-

	for releasing resources from this task		MES module for the main ERP	
C4	To have better access to customer information and to improve work force allocating process	Yes	Comparison and recommendations for selecting a field management tool for allocation, hourly reporting and customer information, and a website improvement recommendations for website development	Employee on operative management had coded a website for the needs of the company
C5	To take to use automated booking and to improve current website	Yes	Comparison and recommendation for selecting an online booking calendar, comprehensive website improvement recommendations for mobile website use	-
C6	To enable traceability of cleaning equipment checked out from warehouse	Yes	Comparison of warehouse, asset and inventory management systems and solutions in current IT/ICT environment where an ERP is deployment phase	New CEO for the company in mid project phase

Table 4. Case company goal and project descriptions.

IT and digital tools adoption factors. Review of each SME companies Business Transformation Map Nine-Field (Appendix 2) presents IT and digital tool adoption factors. Each case is presented separately. The first evidence regarding SME company *attitude and motivation* is that all companies in question have initial motivation as they all have contacted Inside the Box research project and have had some kind of business related improvement in mind. The attitude and motivation most certainly are different or stem from different sources but the contact have been made knowing that the aim of the research project is to increase the use of digitalisation or find solutions for companies which include better use of IT or digital solutions.

Company C1 shows *motivation* on business development by active networking with different business development entities currently. The company is also currently seeking technological solutions to improve business in order to have the future status as market leader who has brought digital tools to the market in a new way. *Resources* are scarce with the company as it is ran by a sole entrepreneur and performs all roles included in the business alone. Regarding resources, a plus side is the business/market specific content knowledge the entrepreneur has accrued over past years. The company's *uncertainties* are linked with the resources and the entrepreneur has stated that he does not have prior skills or expertise in brand building (which is a development target) or business process description building.

Company C2 case is interesting in the sense that, according to the Nine-Field map, the company owners have not been interested in IT in the past. They have realized the importance of IT more frequently which, assumed by the information on the Nine-Field, is due to business growth prospects and requirements. *Motivation* towards IT and digital tools has grown in recent years as the owners have decided that the company needs a mobile app to better distribute their product. Financial *resources* are seen limited by the costly perceived course platform the company currently has. Skills and expertise in own business field are high but lack in business and IT management although the business owners have made efforts on this by joining a business accelerator program. Regarding IT and digital tools, the company has stated that they lack experience which is seen negatively. Own business field is also present in social maturity and the company has vast networks in their own business specific field. Lack of business maturity and technological skills are perceived as causes for *uncertainties* as well.

Company C3 has high vast *resources* regarding IT skills and expertise and is a mature company motivated to improve their business more with IT. The company has been and is currently using ERP (enterprise resource system) and other systems in running their business. The company also has good internal networks as employees are involved to decision-making as stakeholders. The long history of the company has resulted also in some outdated systems and working methodologies which are targeted for change. *Motivation* for change comes from company wanting to have better, automated and transparent reporting and well-functioning traceability of product manufacture. Specific *uncertainties* are not presented by the company.

Company C4 is currently pursuing an improvement project where a project management system is deployed for the company's use indicating that there is *motivation* on higher level IT usage in the company and willingness to invest in IT solutions. The company is also motivated to engaging their employees more to using IT solutions which also benefits them as manual reporting is reduced. The company has been and is using accounting and billing software which shows that a level of IT knowledge exists in the

company. The company also has IT related *expert resources* in the organisation as there are employees with skills in IT shown by the Business Transformation Map Nine-Field.

Company C5 presents *motivation* through the future goals presented which are customer mobile app usage in performing transactions and realtime tracking of cars using IoT-solutions (Internet of Things). The company is not currently using accounting or billing software but it does maintain website which the customers can use to see reservation calendar. There is no customer interaction on the website as the reservation is done manually by the owner after customers have called or emailed. The stated lack of IT or digital tools knowledge *resources* comes apparent by the non-existing software and solutions. The company aims at having business partner networks but does not have them at present.

Company C6 has national business growth in mind and is motivated to use IT and digital solutions for enabling growth. *Motivation* towards IT comes apparent through the company having selected an ERP system which is currently in deployment phase. The company is a forerunner in Finland in their business field which has resulted in ongoing recruitment and growth plans. Growth is seen possible through having and assigning investments *(financial resources)* to well-functioning IT infrastructure.

Change factors during project. Access to company case information by being a member of the research team allowed some additional data access. The change factors in company cases provides additional information to SME company IT development projects. Table 3 shows that the SME company projects vary in content with 4 out of 6 having some factors or issues which were detected by interviews following the Nine-Field model. In figure 7 below we can see each cases initial targets or goals **(C1init.-C6init.)** and the changed targets of the four cases which had an effect on the project **(C1chan.-C6chan.)**.

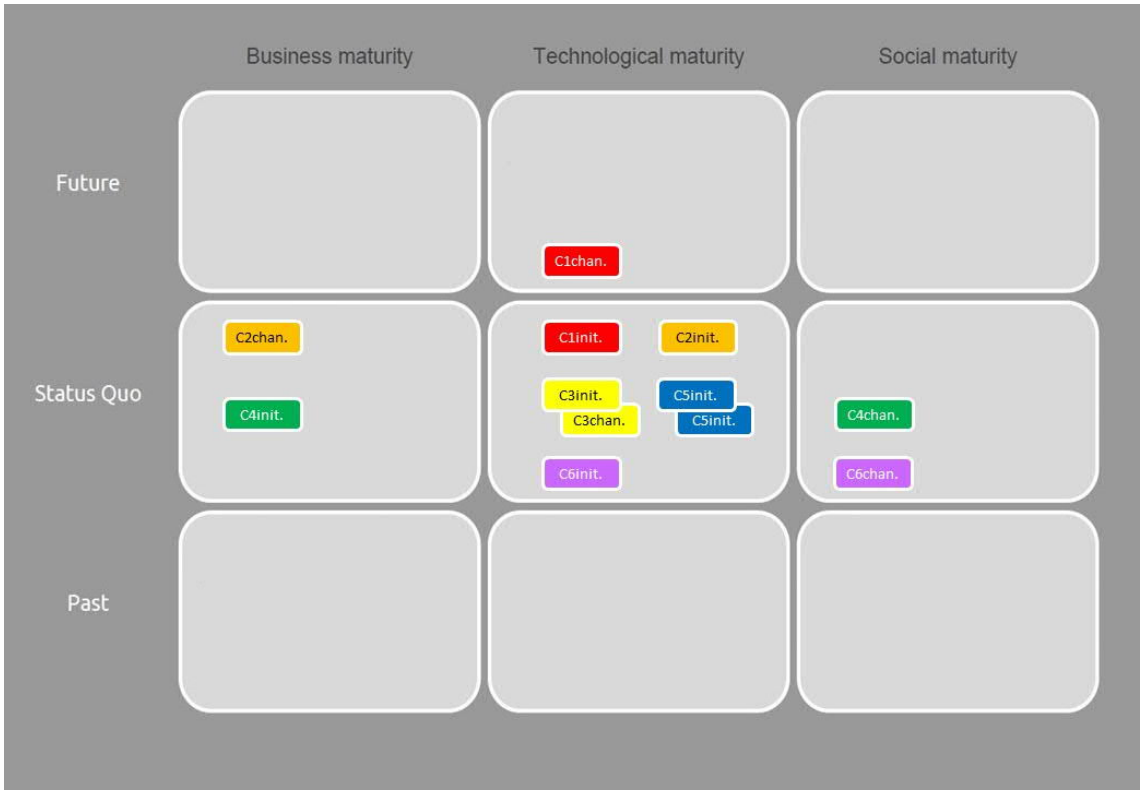

Figure 7. Company cases, initial target and change locations affecting the project.

Table 3 shows that five companies **(C2-C6)** had the development/improvement goal set prior contacting the research team which acted as an outsourced consultant for the companies. From all six cases two customer company projects **(C3, C5)** were carried out with the same prior to contacting targets and goals not resulting in changes during the project. The goal for **C1** was more abstract in nature in terms of the ways it wanted to pursue transparency and decision-making processes' improvement.

The project goal or target changed for companies **C1, C2, C4** and **C6** during project. For **C1**, the abstract nature is likely to be reason for goal change. In the project, the research team offered comparison of project management tools for the company's use in managing multiple entities within renovation and construction projects. This was agreed upon and pursued by the team. The entrepreneur actively sought solutions himself and wanted to bring AI (artificial intelligence) features to the project comparison and make a bigger leap in company technology compared to current situation. This meant that many project management tools on the market fitting to initially set comparison and selection criteria had to be discarded and selection work needed to be restarted with the new AI incorporated criteria. The change was made as research team the student members saw business potential in reviewing AI supported project tools.

Maybe the biggest change in project content was seen with case **C2**. Initially the goal was to compare and recommend solutions for an online course platform to replace the current platform perceived as not cost-effective by the company. This was to be joined

with a market research of possible target markets. After project deal was signed but before the actual work began the company received funding from Centre for Economic Development, Transport and the Environment (ELY centre) to further develop their business which meant that company short term strategy changed in an urgent manner. They had had initial thoughts on developing a mobile application to provide their wellbeing and wellness services and the funding was a step forward in this direction. The project content and goals were reset to still cover the market research but instead of course platforms would now consist ideation and functionalities review for their mobile app. Additionally, it was agreed upon that the research team would interpret one mobile app development offer which was handed to the company during the project time.

With **C4**, the initial plan to compare and review different field management solutions stayed throughout the project but in addition to this it was revealed in the third meeting with the entire team that there was a mid-management level employee with experience and interest in web development and that he had already coded a web solution covering the requirements of the company. He had done this to help his own work as manager and presented his solution to the team. The unfinished website solution was incorporated to the project and improvement recommendations were drawn to finish the web project. This was enabled through top management support for the employee to pursue the development and his interest.

The change of company CEO in customer company **C6** meant that project goals and definitions were to be re-explained to the top management. The project goal itself did not change but the change of the project involved CEO during the project affected the schedule of the project as the whole process and project is reviewed again.

Data Provided by the Business Transformation Map Nine-Field. The Nine-Field maps provided good information on IT and digital tools adoption factors although it is designed to be used in direct work with the customer company. The data can be assumed valid and reliable as it is collected in discussions and interviews with the company owners or key stakeholders. Regarding the change factors not anticipated by the Nine-Field model, it can be said that the model is not intended to foresee future occurrences but to set future goals in relation to what the current status of the company is.

7.4 Reliability and validity of research

The reliability and validity of this master thesis is reviewed through the validity and reliability of the research conducted and research methodologies used. Reliability of an interview research can be described as receiving the same research results when performing the same research to the same person or object. Reliable research is also described as being a research which can be conducted by two different researcher ending up having

similar results. Regarding interview methodology and empirical evidence analysis, it is not likely that two separate researchers can achieve the same exact results and that the concept of reliability is poorly fitting. (Hirsjärvi & Hurme 2010, 186.)

Within this master thesis research, the aim is on gaining insight from IT service providers or vendors who have SME companies as customers. Their lived lives and experiences with SME companies are reviewed against the background literature and research found issues and IT adoption factors, and the findings provided by the Business Transformation Nine-Field Maps. As the research method is grounded theory with a viewpoint from phenomenology where lived experiences are at the core, repeatability of interview results is hard to perform.

Validity of interview research refers to the accuracy of projection of the real world the research presents. Validity is about presenting the circumstances and chosen methodologies regarding the research as well as possible so that the work can be evaluated, reviewed and repeated. Research methodology validity (in interview research) is measured through structural validity, inter-subjectivity, and internal – and external validity. Structural validity evaluates whether the research utilizes concepts and understandings which represent the intended target of research. Inter-subjectivity refers to the researcher's ability to discuss and rationalize the concepts in such a way where the intended audience understands and is able to discuss about the same topic and phenomena. Internal and external validity points to the context of the research which needs to be stipulated. (Hirsjärvi & Hurme 2010, 187-188.)

This master's thesis research draws foundation from three sources; prior research and literature, empirical evidence provided by interview research, and specific readily made available data provided by a research project at Turku University. These provide the researcher with a collected base for constructing the thesis from. The background literature provided a vast pool of theory, concepts and phenomena which were the foundation, the themes and question framework, for the interviews. The Business Transformation Map Nine-Fields provided data on SMEs to further deepen the topic understanding. The reliability of the research comes from detailed description of the literature and concepts used, questions asked and results explanation.

Validity and reliability have some special characteristics regarding the readily available data provided by prior research. Validity means that the presented facts are in accordance with the true situations and statements made within the research. Reliability refers to the repeatability of research results (by other research instances) and evaluation of stability and change tendency of results. In qualitative action research validity and reliability can be poorly applicable due to the nature of action research which is interpretative building social reality through interpretations. Regarding reliability, action research which aims at change is impossible as reliability strives for the opposite. (Heikkinen, Rovio & Syrjälä 2006, 147-148.)

Instead of validity Heikkinen, Rovio and Syrjälä (2006, 149-160) suggest using validation for reviewing action research which is continuous and consecutive concept comparing to validity. Validation of research is done through five principles; historic continuity, reflectivity, dialectic process, applicability (feasibility) and evocativeness of research. Regarding specific company cases (micro level study) *historic continuity* refers to company research where companies are perceived as continuously evolving entities in which individuals give narrative descriptions. This means that by describing the plot (narrative situation) in which the company currently is, the timely evolving nature of companies is presented.

Reflectivity refers to the researcher's role and requirement to realize the conditions and limitations he has regarding the research. The role of the researcher as narrative and reflective brings transparency to the research which is strived for by giving detailed information research, on SME companies in the research in question. Regarding the Business Transformation Map Nine-Field Model and the company case analysis, the cases were presented in detailed description tables and narrative analysis of each case in chapter 7.

Dialectic process is described as being formed through discussion where claims and propositions are given which meet countering propositions and counterarguments resulting in synthesis or agreement. (Heikkinen, Rovio and Syrjälä 2006, 149–160.)

In this study the discussion has been between literature found SME company IT and digital tools adoption factors and empirical evidence provided by six IT service provider interviews and data collected from Business Transformation Map Nine-Fields from six company cases. The results were provided in chapter 7 and conclusions of these studies were given in chapter 8.1.

Applicability and feasibility reviews the research from the practical implications viewpoint. What are the benefits of the research and how useful are the results (Heikkinen, Rovio and Syrjälä 2006, 149–160). The conclusions in the next chapter provide the practical implications and discuss the benefits this research provides for companies but also future research.

Lastly, the evocativeness of research refers to the researches ability to evoke new thinking (Heikkinen, Rovio and Syrjälä 2006, 159–160). Within this research the aim is to provide new viewpoints on SME IT and digital tools adoption. There is a vast amount of research done on the topic but no prior research was found done in Turku region, Finland. The purpose is to draw attention to the affecting factors and provide useful guidelines for people working among IT in SME companies and IT service providers and vendors who have SME companies as customers. It is the belief of this master's thesis researcher that SME companies can achieve higher level business efficiency and work wellbeing through better and vast use of digital tools.

8 FINDINGS AND DISCUSSION

Literature, empirical evidence by interviews and the data provided by the Business Transformation Nine-Fields give vast insight to SME companies IT and digital tools adoption factors. Literature review presented SME daily lives as working with limited resources, both in terms of time, money and expertise. The decision-making of a company revolves around one or few decision-makers, usually the CEO/owners. This is supported by the interview results by all interviewees agreeing with this. In theory Huang, Zmud and Price (2010) state that the daily work and decision-making in SMEs is performed without structure and Jansen et al. (2011) continue that decisions are made under limited processing capability. Harindranath et al. (2008) came to the conclusion that SME companies are constrained with lack of strategic insight. This is also supported by the interview results, and all reported that processes are not clear within SME companies and lack documentation. Reasons for this is are for example the nature of SME business, the day-by-day way of performing work where having documentation is not seen as a value or worth the effort and resources. Interviewee 4 stated that SME companies lack comprehensive, cost-effective way of thinking which is due to daily manner of running business.

The lack of expertise and skills were presented by three SME company Business Transformation Map Nine-Fields as well which indicate that this factor is a valid IT adoption affecting factor. The Nine-Field case analysis also describes the day-by-day nature of SME companies by the changing project goals and targets. As seen by figure 7 in chapter 7.3, the goal of the project changed during the project or the project was affected by a change in the company. This shows that SMEs tend to move quickly from a situation to another.

The background literature presented concepts of perceived usefulness and perceived ease of use as factors affecting IT adoption. This comes to light partly by IT service providers and vendors expressing their view on SME company decision-makers thinking that they know the real need or requirement of the company (4/6 interviewees). This can be interpreted as SME company decision-makers having done some prior review on what is missing from the company or needing improvement and has decided on his/her own what is the solution needed. The same four interviewees stated that it is most common that IT project scope expands during the project as true needs are revealed/discovered. The same findings can be seen in in the Business Transformation Map Nine-Fields where we can see that five out of six companies had prior to project set goal or target and by the fact that with four out of the six the project target changed during the project. Having prior to project made decisions can also be an attempt on alleviating uncertainties in regards of using outsourced consultants (described below).

Networking with company external entities. For various reasons, SME companies turn to outsourcing and creating networks with outside entities mainly to improve their

own business functions. On the other hand, networking includes the exchange over knowledge and information. Here, the viewpoint is on networking and outsourcing in general and externally, Networking related to knowledge acquiring is dealt later with employee training.

Through the analysis of SME companies with the Nine-Field model we can see that out of the six SME companies four have networks they rely on or see value at. The reasons for belonging to networks can be assumed by the networks' nature and role. Most likely the reasons are to gain more visibility on market, to acquire customers and to gain business information and benefits. For example, two of the SME companies are members of an organization foreseeing the rightful and lawful follow of Contractor's Obligations Act in Finland. All members are vetted and when accepted, gain the "reliable partner" title for their use which will possibly be reviewed positively by potential customers when selecting their construction contractors. One other example is two SMEs belonging to the Federation of Finnish Enterprises (Suomen Yrittäjät), and by belonging to the network SMEs gain benefits such as legal counsel, necessary document information to name only a few.

The same can be stated for the interviewed IT service providers and vendors which are all SME companies as well, out of which four out of six describe belonging to one or more networks. Regarding the interviewed, the four belong to peer-to-peer networks meaning that the networks revolve around the topic of IT and the reason for belonging to these is to attract more business. Networks are utilized many times for communities-of-practise type usage; to resolve problems, discussion with peers but also for entering competitive tendering by joining forces against large-size IT conglomerates taking the market.

Networking is important for IT companies as customers do not simply come to or contact IT companies, and all interviewed stated that they use resources on customer acquiring. For example, although seen resource-taking and unpredictable regarding results, all interviewed companies market their services and try to attain customers through cold calling potential customers. Networking with peers can be seen as a prerequisite to recommendations as well. All interviewed said that they recommend other IT companies to potential customers when their own services do not cover the customer need. Knowing the IT field and communicating with others in it will surely increase recommending.

SME uncertainties in IT/digital adoption. Theory described SME working and functioning as uncertain in nature and companies unable to predict or control the external environment because it is constantly changing. Resources (time, money and expertise) are limited and decisions are made according to SME company owner-manager personal attitudes and prior expertise, and with CEO/owner-manager having many times all responsibility over every decision. (Atherton 2003; Oikarinen et al. 2012; Karjaluoto & Huhtamäki 2010.)

All interviewed agree that SME companies lack understanding in regards to the environment their operating in. IT service providers (the six interviewed) see their task as presenting this bigger picture for their customers by describing new IT infrastructure benefits for example, by stating what brings value for the SME company, and by showing how to take full advantage of selected tools/systems. Interviewee 2 stated they need to present concrete and total value of each IT related potential for the SME customer companies.

Financial issues are one of the main uncertainty causing factors (*see*: Harindranath et al. 2008). This is validated by all interviewees stating that SME company decision-makers do feel anxiety over financial issues, and that money is the single most named uncertainty creating factor which is seen in SMEs being uncertain over IT technology and system acquisition prices but also regarding SME - IT service provider relations. SMEs are concerned over cost structure or expenses the IT consultant is charging from them.

Regarding financial factors, theory presented the pay-per-use payment methodology by which companies pay over services and tools according to time, cycles or volume without down payments or purchases making computing power to be like an utility (Habib et al. 2010; Neves et al. 2011). All six interviewees had witnessed the arrival of pay-per-use to IT and agreeing that it is the big trend now. One interviewed stated losing a customer because his company is not providing services with pay-per-use payment option. Pay-per-use can be a good payment method for all parties as it can be easily budgeted and it provides steady income for service providers.

Another trend seen is trialability or tryout culture which is seen by three interviewees who state that companies today want to have shorter termination times on purchased services. As stated by theory, adoption decision barriers might be smaller when the subscription times are short and decision-makers see opportunity in testing out different providers without long time commitment.

Trust. The issue of trust has stand out to all interviewed in one form or another from resource related factors such as time and money causing frustrations to more abstract issues. IT service providers reported witnessing fear in SMEs regarding IT and that some decision-makers do not want to break employee trust with having IT projects that end up in layoffs. This finding is first not identified by background literature which did recognize uncertainties and even fears. SME business owners being afraid of IT projects because these might lead to employee contract termination might indicate that the communal (community) aspect in SMEs is highly valued. Interviewed also stated cases were SME company employees have lost trust to their superiors because of fears over losing their jobs due to decision-makers not asking the employee viewpoints on IT/digital improvements.

Theory presented that SME companies have less abilities to acquire IT capabilities and they seek outsourced services, tools and knowledge to bridge the lacking. By acquiring

outsourced support, SMEs enter into contracts of structural and psychological trust which defines that none of the parties act opportunistically. (Devos et al. 2012.)

All interviewed IT service providers stated encountering uncertainty, doubt or trust issues while working with SME companies which can cause slow progression on joint projects. The uncertainties are many times aimed towards the solutions proposed by consultant companies rather than consultancy in general. Although all agree that in general consultants and outsourcing has a good reputation evident by the amount of outsourcing done today, two interviewees say that they avoid using the term 'consultant' which might be due to consultants having a bad reputation in the past. Two interviewees reported encountering situations where the ability to cover some requirement or the size of the IT company had been questioned by the customer.

Resolving uncertainty and trust issues. The interviewed IT service providers and vendors stated that clarity and being straightforward by stating company, consultant and outsourcing situations as objectively as possible cover most of the issues related to trust and uncertainty and make overcoming them possible. Clarity needs to be applied to technological issues as most often the decision-makers are not experts in these fields but it also needs to be applied to describing the outsourcing or consultancy agreement; for instance the cost structure, time frame, and issues that may affect the success of the project.

When uncertainties are encountered, extra resources need to be allocated to overcome them. Face-to-face meetings are most often required and transparency is needed. Transparency is key and the SME customer company cannot be left with any doubt that something is withheld from them. A key factor to avoid uncertainties is to provide customer companies with up to date information on project progress distributed to them regularly, preferably on weekly basis.

Use of maturity models, tools and frameworks. Different models and tools enable companies to improve business capabilities through assessing their maturity in regards to some aspect of their business and get suggestions for moving forward. (see: Röglinger et al. 2012; Albliwi et al. 2014).

SME companies have multiple ways they can identify their IT situation with. The main goal of these tools is to provide knowledge on company current situation and what aspect of their business they should target next, and what are the adoption affecting factors in each company. The literature revolved around technological, environmental and organisational factors joint together with employee and decision-maker personal and individual factors. Although varying in their scope and research results, all different ways had seen good results.

The interviewed were both for and against of using readymade tools, questionnaires and maturity models in discovering the IT development target for SME customer companies. Although maturity models are mainly seen good and five out of six answered that they could provide good information for companies on what to improve next, none of the

IT companies use them to identify customer company needs or requirements. Instead, four interviewees stated that they have some form of questionnaire in use by which they try to capture the customer company business functions and needs. Two companies use readymade government provided questionnaires and two use their own modified solutions.

According to the interviewees it is very rare that their SME customer companies have any kind of maturity model in use. Two interviewed have never seen SMEs using maturity models and four state that they have seen it only seldom. The same goes for IT service provider companies themselves; four of the interviewed are not using maturity models in their business development work at all. One company specialized in information security says due to the nature of the business field, they need to follow many standards and frameworks, and another company stated that they had been following one specific maturity model but had given up on it for using a variety of more agile models to follow their own development and progress.

Reasons for not using maturity models are given by three interviewees; they are many times too difficult to implement and if applied, it needs to be fitting to small-size company use, it shouldn't take too much resources or specification to implement. These same reasons were given by literature, and for this reason it can be stated that there is space and need for lightweight maturity models for identifying the logical next steps in SME digitalisation. The use of different models, tools and frameworks should be emphasized and recommended for SMEs as they can provide help towards realizing the current processes and their weaknesses.

Social context in SMEs – hierarchies, knowledge mapping and employee training. Social hierarchies were shortly presented in theory. Khan (2016) stated that one of the key characteristics of digitalisation is hierarchy removal. The interviewed were asked whether they pay attention to hierarchy issues and have they encountered problems with them in their cooperative projects with SME companies. All had encountered hierarchies in their work and five out of six interviewees had encountered what was described as hidden actors. These are employees not visible or presented to the consulting company but who have a say in the project progress and over decisions made. These hidden actors sometimes cause problems and frustration in the projects as outsourced companies cannot address the issues as they are raised only internally. In IT decisions and projects, the decision-making can be given to someone without a high-level rank. This person usually is someone with interest towards IT. These hidden actors are the second factor in SMEs not recognized by the background literature. According to the interviewed, the hidden actors play an imperative role in IT project success. Although it is commonly understandable that all employees of a SME may be involved in all or many activities of the business, it might be of value to identify the hidden actors and involve them in IT projects.

None of the interviewed companies have tools for identifying hierarchies but four state that they do it in their mind "unofficially" to discover the people with the rank and say over issues dealt with outsourced consultants. As a result it can be suggested that this type of tool might be needed and that it would provide assistance to SME companies recognizing their processes and roles. This kind of tool could also provide help to outsourced IT companies who would be able to improve project risk assessment and discover the hidden actors they should be having discussions with during projects.

SME knowledge mapping and employee training. Knowledge and skills of company employees describe the human capital of the company. Knowledge is the key component for SMEs themselves to answering and overcoming uncertainties, and the more a person has knowledge, the more he/she has capabilities to make coherent and specialised decisions giving companies more competitive advantage. (Jansen et al. 2011; Atherton 2003; Alavi & Leidner 2001.)

Although benefits of investing in knowledge are shown to SME companies, according to the interviews, the SME companies are not fully understanding them and are divided in half between the ones who map out the knowledge within their company and the ones who do not. Four interviewees state that half of companies excel in knowledge management and the other half performs very poorly. It must be acknowledged that in small companies people know each other, who they are, what is their knowledge and what are they interested in making it obsolete to having separate knowledge mapping tools. However, SME companies should be made aware of the potential benefits. Knowledge mapping does not need to be a vast program but it should be, for an example, a facilitated discussion sessions where employees are enabled to discuss their thoughts and teach and learn from one another. One interviewee discussed about informal coffee brakes as a platform for these discussions.

Knowledge sharing and employee training are seen important parts of both human capital activities and SME business improvement. Whelan and Carcary (2011) described talent management (TM) as a solution for companies to make most of and planning of employee training. Talent management can also take resources from SMEs but the same as above applies here, and the smaller size companies should make small efforts in employee education. According to the interview research results, some companies train their employees and some do not almost in 50/50 ratio, results follow closely to the ones found with knowledge mapping.

Employee training is slowly becoming as a trend and the benefits of it should be brought to SME company decision-maker attention. Interview research revealed some challenges regarding employee training. According to one interviewed, the challenge is that employees have negative attitude in training sessions if they have the viewpoint that the change or improvement done and being trained is not needed. Another interviewee stated that training needs to be tailored and made company specific for it to have desired

outcomes and that this customisation will make the training expensive and SMEs are not willing invest to them.

One solution for knowledge mapping and employee training in SME companies could be creating informal communities-of-practise where motivated employees could discuss work related topics and resolve problems together. This of course takes place a lot today without any involvement or promotion of communities-of-practise but considering the potential benefits and to make digitalisation speed up, the concept might be worth presenting to SMEs. Emphasizing communities-of-practise can affect the SME's attitude towards opportunity recognition an IT adoption.

Public/Governmental support for SME digitalisation. The interviewed were asked what should be done to SME company digitalisation, how to improve it, and how do they see public and governmental support towards SME digitalisation. The answers varied with having positive and negative aspects to present in regards to government support.

Firstly, all stated that government support is good to have and that companies should be made aware of different types of support they can receive. On the other hand, public entities making one time type "injections" of money was said of having the possibility of having quick positive leading to negative result after the injected funds run out. Secondly, five out of six interviewees stated that the IT companies themselves have the responsibility or task to bring forward and do marketing on their business through success stories and by show casing the benefits digitalisation can bring to companies.

Caniëls et al. (2015) brought up the intrinsic motivation of perceived enjoyment of using digital tools, and this might be a factor worthwhile bringing to more attention with SMEs when marketing solutions. This joint together with Fulantelli and Allegra (2003) presented way of showing short-term and long-term benefits of digitalisation might be valid here as well.

Regarding the Innovation voucher given by Business Finland (former Tekes) to SME for innovation, four interviewees, quite surprisingly, saw as an example of negative government support as it can distort market, create targeted consulting for using only this voucher from SMEs, and it can be used only to specific kind of development perceived too narrow for digitalisation needs presented by SME customer companies to them.

8.1 Limitations

This master thesis work uses purposive sampling in its selection of the interviewed IT service providers and/or vendors. According to Lund Research (2012), the main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which can be able to answer the research question and topics. The sample being

studied does not represent the entire population and in qualitative research it is not considered as a weakness.

Within this master thesis, the interviewed persons are selected on their homogeneous characteristics; they all are IT service providers or vendors to SME customer companies and have at least ten customers per year. The selection is based on the researcher judgement and selection which is based on the understanding that these IT companies' representatives have knowledge on SME company IT adoption affecting factors. The research is conducted in Turku region, Finland, and thus a criteria for the interviewee selection was their operation in Turku region. Acknowledging these criteria is done in order to give detailed information on interview structure, the way of conduct and to alleviate researcher bias.

Lund research (2012) also states that the representativeness of purposive sampling can be questioned as the sample size is small and the selection of the people interviewed is done based on researcher subjective selection.

With this master thesis research, the sample size is small, only six interviews and six SME companies analyzed. It can be acknowledged that according to these sample sizes, there cannot be made generalizations of the results. However, it must be acknowledged that the interview framework and questions in it are found from literature and are based thus on prior research on the topic. The aim of the research was to identify whether the literature found IT adoption factors were found in SMEs functioning in Turku and to provide people working in the business field some recommendations. The research does this and gives details on all factors affecting the it.

8.2 Future research

The research brought up many concepts which could be further examined and researched. In this master thesis we took the standpoint towards SMEs were the EU's definition was used. However, as notioned in the introduction chapter, there are many types of SME entrepreneurship which all deserve their own research. Solo entrepreneurship is one of them. Out of the six SME company cases presented by the Business Transformation Map Nine-Field, two were ran by solo entrepreneurs making all the development work and decisions whilst at the same time running the operational day-to-day work. It could provide a fruitful research to look into the special features of these type of businesses and what IT investments could provide for them.

Another topic worth further research is the interview raised hidden actors in SME companies. Most interviewees stated encountering them while working with SME customer companies and they further stated that these hidden actors had a great impact on the IT project at hand. It would be interesting to research on the true nature of these hidden

actors, what are their roles and titles in companies, does companies which have them present the same kind of hierarchies and quite simply, why are they not part of the official IT development team if they have such meaningful role in the organisation.

Third, throughout this master thesis we have had different parties describe, research and discuss about SME company owner-stakeholder uncertainties. They stem from different sources be it resources, trust or other factors. Ultimately, the concept of sensemaking is key as it defines whether the decision is made. The moment of sensemaking can be achieved through the support of different models, frameworks and tools, teams, sponsors, communities-of-practise of likeminded and/or knowledgeable people but if sensemaking does not take place, the decision is unlikely made. This in mind it thus seems that sense-making is a core concept in this master thesis which is important and interesting to re-search further. Although widely researched in different business fields and in information systems science, the concept could be researched more.

9 CONCLUSIONS

The aim for this master thesis work was to research IT and digital tools adoption factors in SME companies with a research question: 'What are the IT and digital tools adoption affecting factors in SME environment?'. According to this master thesis research SME businesses are affected by rapid, daily change and by all internal parties moving from one task to another without longer term strategies.

Limited resources (time, finances, skills and expertise) affect decision-making and attitudes towards acquiring new technologies and putting them into use. Due to resource scarcity, negative attitudes and uncertainty arise which in turn can lead to SME decision-makers not willing to take action. The first new finding not found by the selected background literature was the issue of SME owner/CEO fear over needing to terminate employee contracts after IT improvements and digital tools adoption. The benefits of improving business functions with IT solutions are seen imperative and outweighing the negative impacts, and SMEs should thus act on IT and digital tools adoption and make their businesses more efficient.

SMEs see value in outsourcing and acquiring outsourced knowledge as it resolves limited resources regarding expertise. However, there exists some lack of trust between outside vendors and customer companies which usually relates to financial issues or lack of understanding the co-operations end goals.

Human and social capital, the skills and capabilities within companies and the networks they have and are part of play a critical role in IT and digital tools adoption. Internal capabilities and willingness to develop them in SMEs dictate what the company can undertake and accomplish successfully. SMEs should invest in internal knowledge and these investments does not need to be sizeable and resource-taking. For example, the informal and easy-to-access communities-of-practise can be a source and a sharing platform in SMEs. External relationships and networks enable knowledge accrual from a wider group of partners and stakeholders which in turn enables companies to make well informed decisions. Within all types of relationships trust mitigates risks and reduces barriers. The second new finding not evident in the background literature was the existence of hidden actors in SME IT projects. The hidden actors affect IT projects once they are commenced. It is to be believed that they have an impact also on attitudes towards IT and digital tools prior to projects, an issue which should be addressed internally and taken into human capital assessment.

Understanding business processes is key to successful IT adoption and to improving the business overall. Putting efforts on finding out and depicting the way business is carried out enables businesses to pinpoint strengths and possible weaknesses which could be developed to a better functioning level. Acquiring this knowledge is the preceding act which ensures that growth seeking activities focus on correct targets.

The many available IT and digital solutions can affect IT adoption. Maturity models, methodologies, frameworks and tools guide companies in decision-making by providing steps to move to a higher level of maturity or better use of tools. There is no one solution to fit all companies which is due to a vast variety of business fields, company structures and ways of doing business. All solutions require some resources invested when implementing them but although this, SME companies should make use of them as they can provide meaningful information regarding the setting of the correct development targets.

IT and digital tools can provide efficiency and wellbeing for companies regardless of size. In order for SMEs to stay afloat, not to mention to grow, they need to understand the value and benefits of IT solutions. The pay-per-use payment methodology has changed the way people use software and IT solutions making it possible to start using them without large initial costs. Pay-per-use together with the possibility to try out different solutions should be more endorsed as they enable companies to see concretely the benefits they can achieve.

The bottom line and barrier to overcome with all of them is SME owner, decision-maker and/or stakeholder sensemaking. Like all other company decision-makers, SME CEOs and owners making decisions need to understand, perceive the usefulness and utility, and benefit of the proposed action or solution available before they can make an argued decision. This calls for transparency and clarity from the IT service provider's or vendor's part. The cost-benefit structure and terms regarding the solution features and benefits need to be made clear.

9.1 Shortlist for SME IT specialists and outsourced IT service providers

From the findings of this master thesis research some guidelines and tips can be generated for the use of people working as IT specialists in SMEs or as outsourced IT consultants. Apparent with these is trust which is a key factor in these relationships.

1) **Be upclose and personal.** Especially regarding outsourced IT resources, there are uncertainties in the relationships between SME companies and outsourced consultants. Close and personal connections with SME customer companies can alleviate these uncertainties. Generic sales speeches will not result in desired levels of trust and the IT specialist or IT service provider needs to make an effort in explaining the benefits and other factors in relation to the SME company in question.
2) **Be transparent.** SME companies tend to perceive financial factors as a key constraint in their business and as a barrier to adopting IT and digital tools. Transparency over contract terms and costs are crucial in order for achieving well-functioning relations.

3) **Foster trust.** Trust can be fostered through transparency and close knit relations but it can be supported by structural solutions as well. Service-level agreements, project plans and set milestones might sound coming from the past but they have their place as customer companies want and need to have concrete material on what has been agreed upon and what is the process order of continuance.
4) **Visualize benefits.** The different models and tools available for companies to use are not used as they are perceived as resource-taking and/or complicated to use. However, the use of these, often visual, solutions is recommended. They help customer companies to see their current situation and pinpoint the weaknesses they need or should improve in their IT or on other business aspects.
5) **Think on financial structure.** Costs and financial issues are perceived as constraints in SMEs. The pay-per-use payment methodology and trialability have been introduced to IT field already many years ago. Enabling and promoting these two concepts can lower barriers to start using IT solutions, or, at the lowest level support try outs in SMEs. As made evident by EU and national entities, Finnish SMEs are lagging behind in digital tools adoption. They should be encouraged and IT service providers and vendors have a key role in supporting this by providing easily accessible ways of digitalisation.

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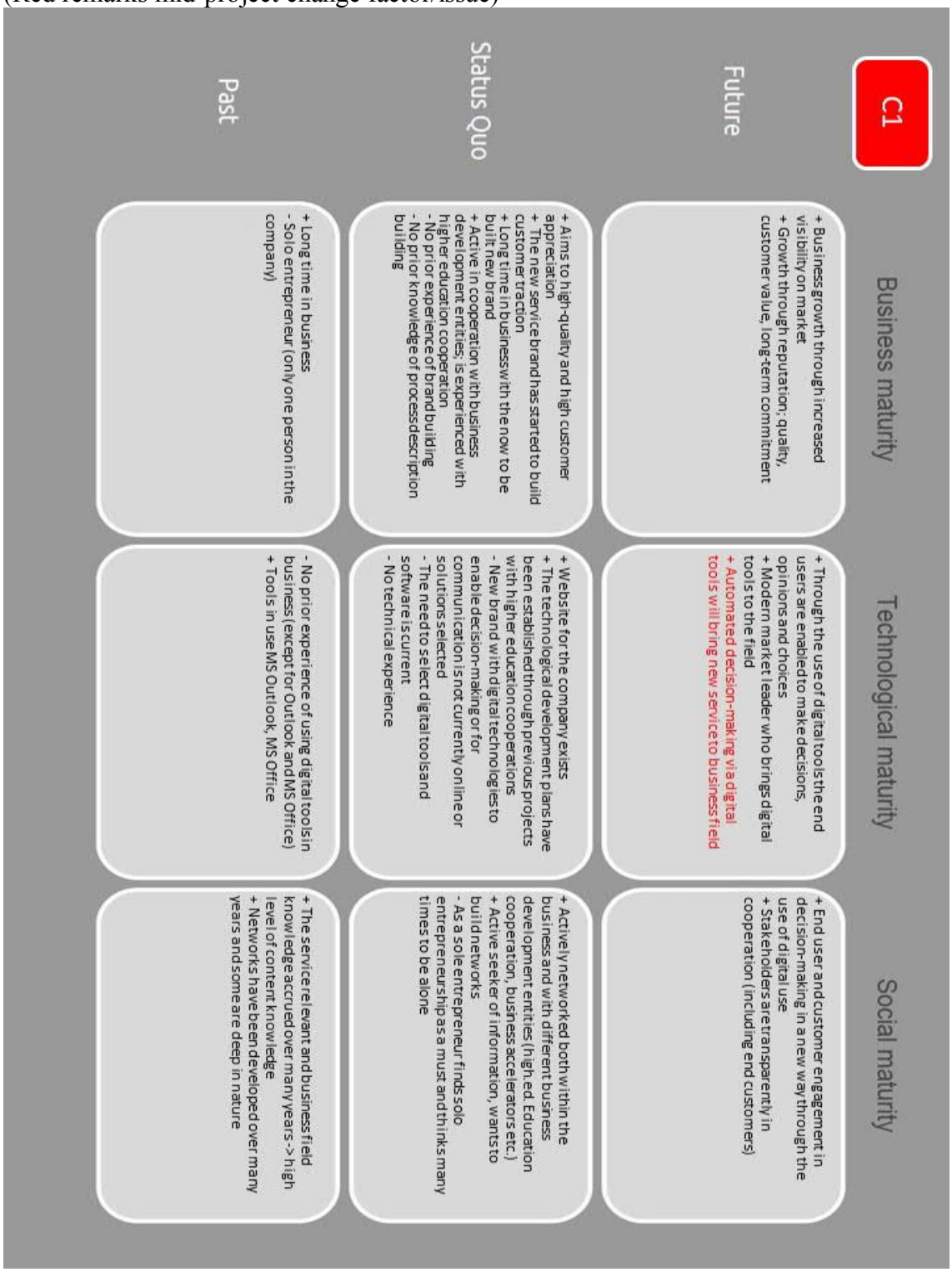
APPENDICES

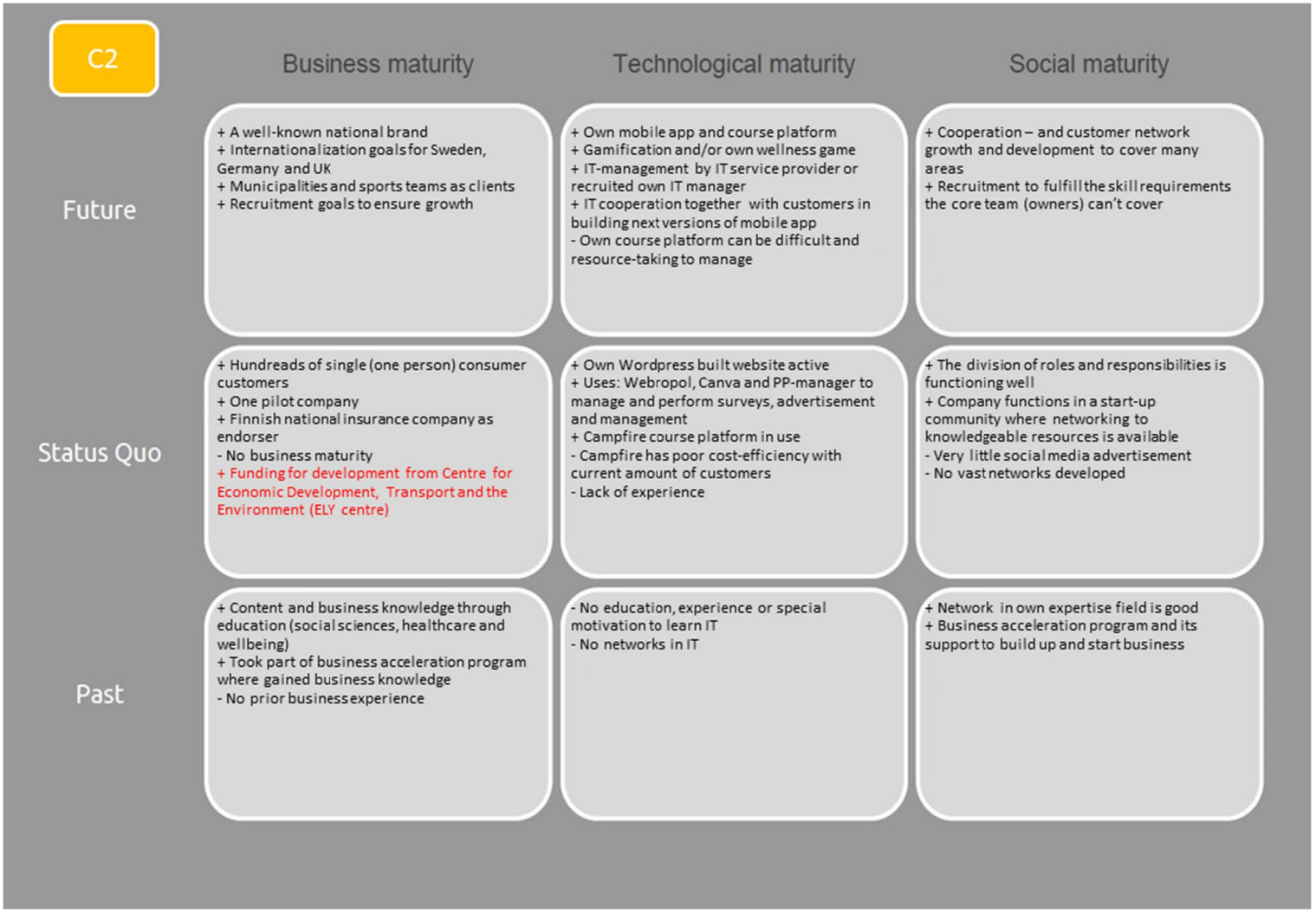
Appendix 1. Interview questions.

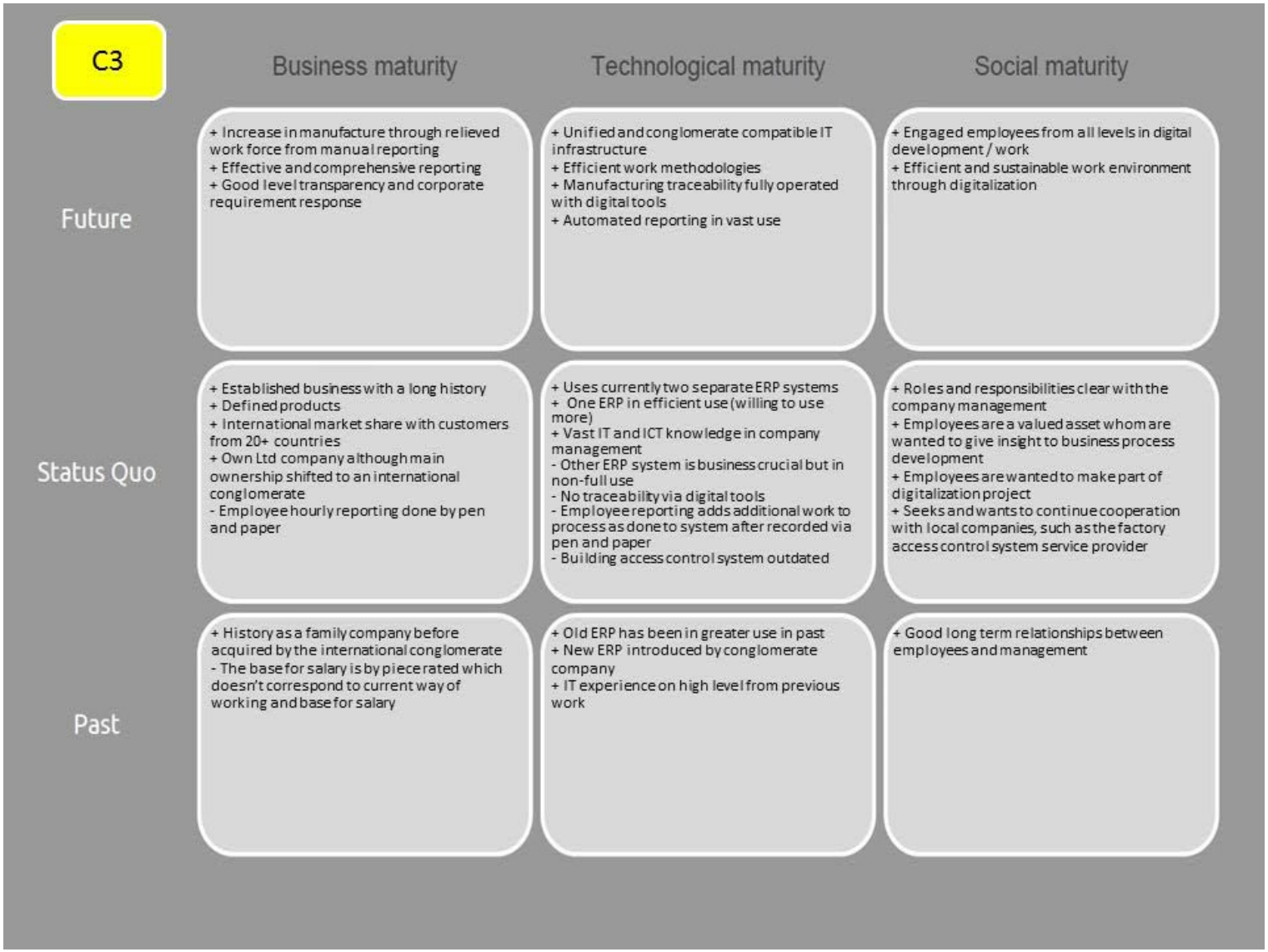
1. Do you have SME companies as customers?
2. Do you have 10 or more SME customer companies per year?
3. Is there a definition of a typical customer and are they seeking certain services or do they know what their needs are?
4. Can you describe on general terms in which situations SME companies seek help or support regarding IT acquisition or digitalisation?
5. Can you describe situations or reasons where/why customer companies present uncertainty?
6. Have companies indicated uncertainty or distrust towards your company offered outsourced IT services?
7. Have you encountered situations where SME customer/client companies or representatives of them have expressed doubt or scepticism towards the solution your company has presented to them?
8. Are business processes clear in SME companies?
9. How SME companies find your services and become your clients?
10. Is there a typical decision-making process in SMEs?
11. Have your customer or client companies conducted evaluations on business situations or levels prior to contacting you and becoming customers?
12. Do SME companies map out their employees knowhow? Is it documented somehow?
13. By your own experience with SME companies, do companies train their employees or themselves?
14. When you start performing a review on customer need, do you take the social aspect of the company into consideration?
15. Do you use maturity models yourself for reviewing your company evaluation?
16. Are you using or have used maturity models to discover the customer/client company IT needs?
17. When a new customer project begins, what are the ways or methods used for identifying the customer need?
18. What is your general opinion on using maturity models in SMEs?
19. When talking about increasing the level of digitalisation in the SME field, what should be done for it?
20. Have you witnessed the trend of pay-per-use payment methodology and has it changed the way SME companies are investing in IT?

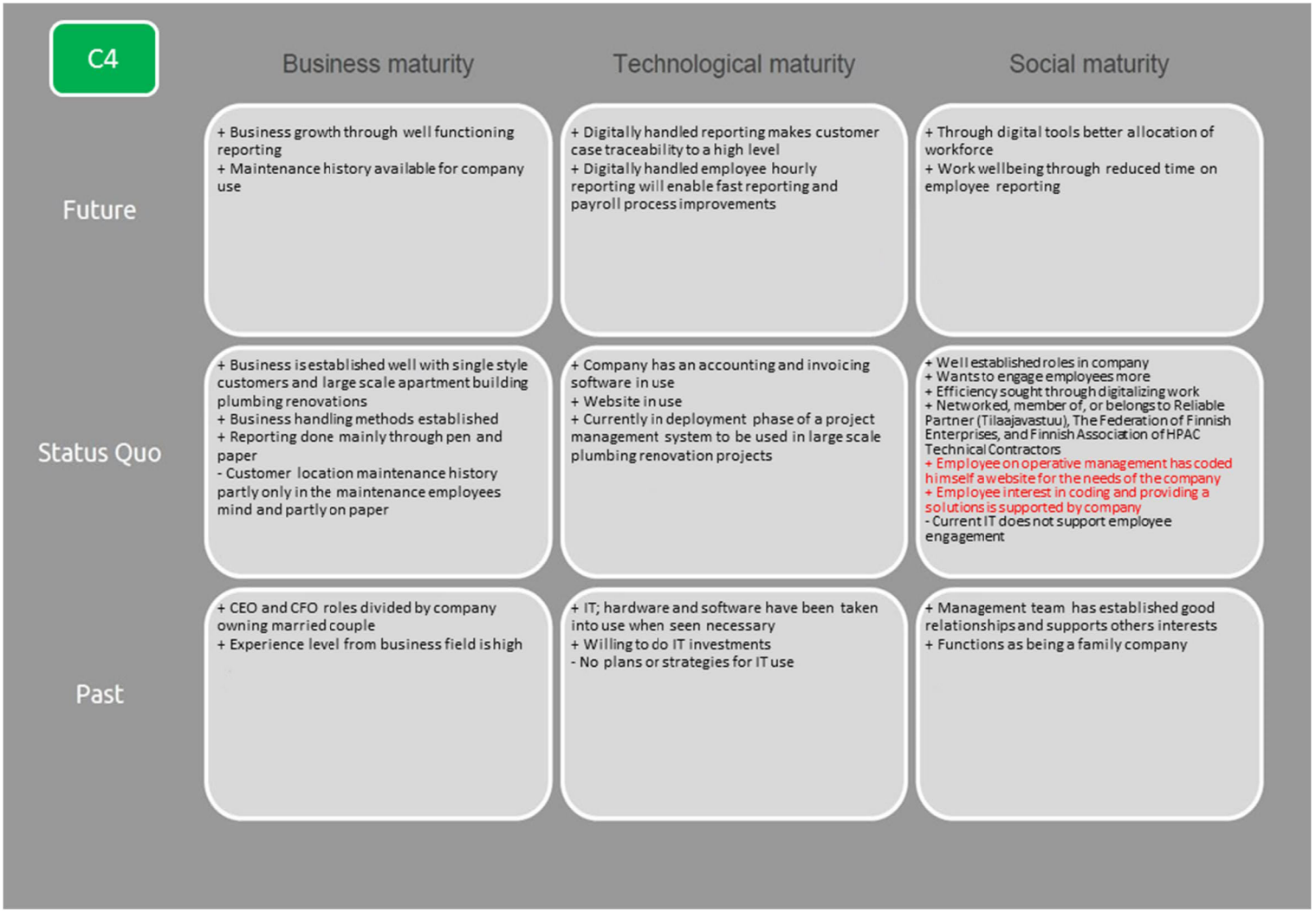
Appendix 2. Business Transformation Map Nine-Fields of six SMEs

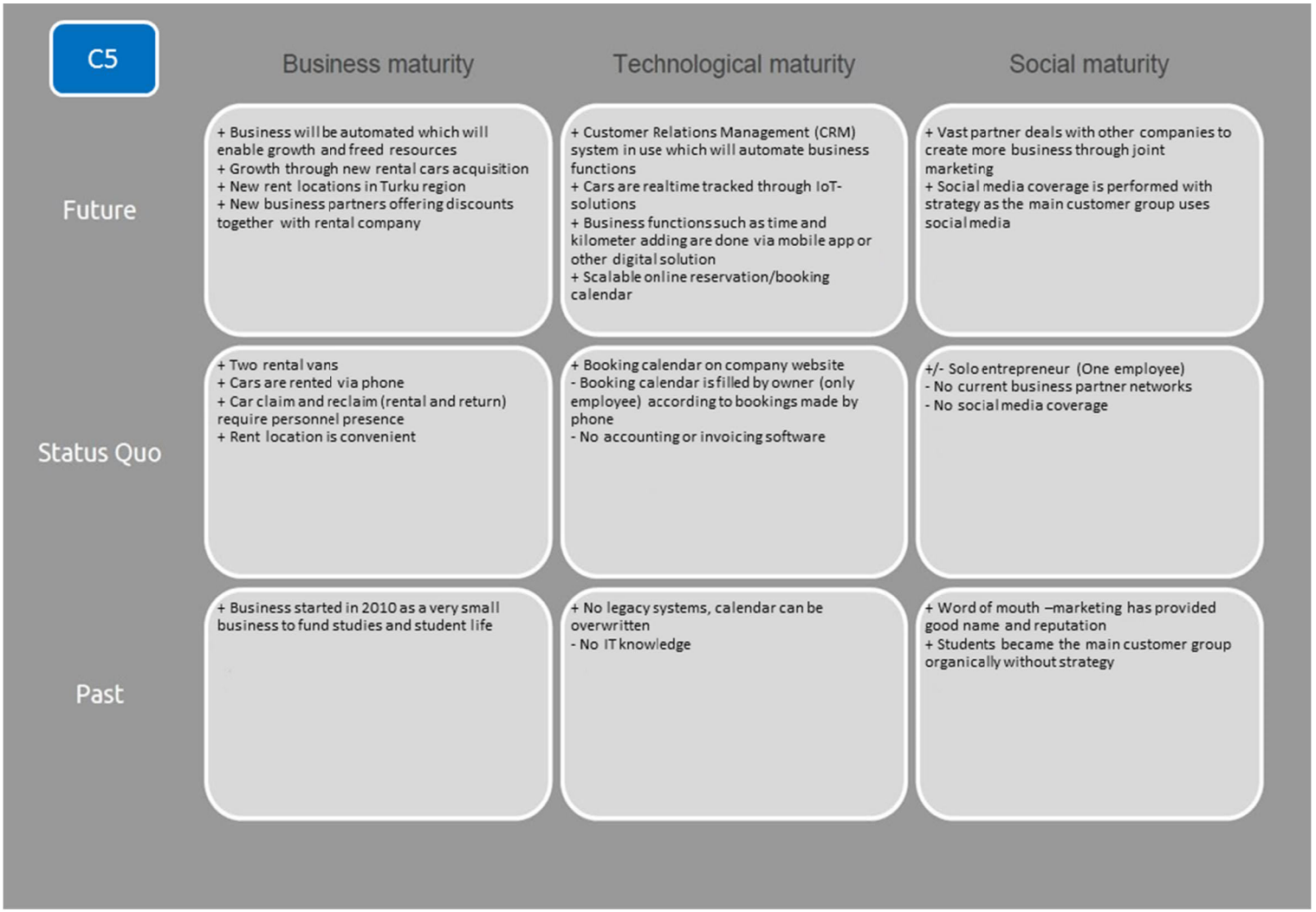
(Red remarks mid-project change factor/issue)

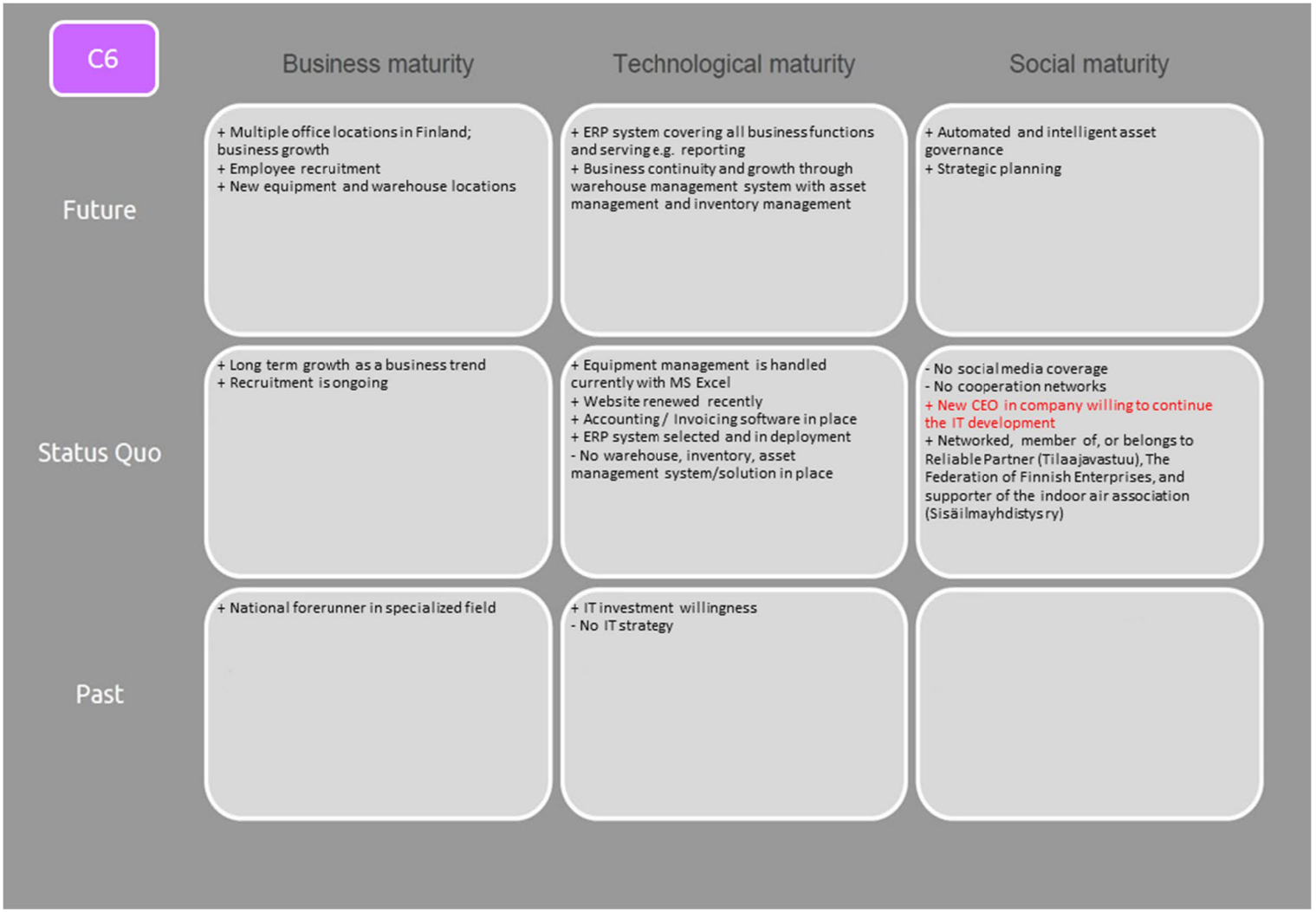



C2
Business maturity
Technological maturity
Social maturity
Future
+ A well-known national brand
+ Internationalization goals for Sweden, Germany and UK
+ Municipalities and sports teams as clients
+ Recruitment goals to ensure growth
+ Own mobile app and course platform
+ Gamification and/or own wellness game
+ IT-management by IT service provider or recruited own IT manager
+ IT cooperation together with customers in building next versions of mobile app
- Own course platform can be difficult and resource-taking to manage
+ Cooperation – and customer network growth and development to cover many areas
+ Recruitment to fulfill the skill requirements the core team (owners) can't cover
Status Quo
+ Hundreads of single (one person) consumer customers
+ One pilot company
+ Finnish national insurance company as endorser
- No business maturity
+ Funding for development from Centre for Economic Development, Transport and the Environment (ELY centre)
+ Own Wordpress built website active
+ Uses: Webropol, Canva and PP-manager to manage and perform surveys, advertisement and management
+ Campfire course platform in use
- Campfire has poor cost-efficiency with current amount of customers
- Lack of experience
+ The division of roles and responsibilities is functioning well
+ Company functions in a start-up community where networking to knowledgeable resources is available
- Very little social media advertisement
- No vast networks developed
Past
+ Content and business knowledge through education (social sciences, healthcare and wellbeing)
+ Took part of business acceleration program where gained business knowledge
- No prior business experience
- No education, experience or special motivation to learn IT
- No networks in IT
+ Network in own expertise field is good
+ Business acceleration program and its support to build up and start business


C3
Business maturity
Technological maturity
Social maturity
Future
+ Increase in manufacture through relieved work force from manual reporting
+ Effective and comprehensive reporting
+ Good level transparency and corporate requirement response
+ Unified and conglomerate compatible IT infrastructure
+ Efficient work methodologies
+ Manufacturing traceability fully operated with digital tools
+ Automated reporting in vast use
+ Engaged employees from all levels in digital development / work
+ Efficient and sustainable work environment through digitalization
Status Quo
+ Established business with a long history
+ Defined products
+ International market share with customers from 20+ countries
+ Own Ltd company although main ownership shifted to an international conglomerate
- Employee hourly reporting done by pen and paper
+ Uses currently two separate ERP systems
+ One ERP in efficient use (willing to use more)
+ Vast IT and ICT knowledge in company management
- Other ERP system is business crucial but in non-full use
- No traceability via digital tools
- Employee reporting adds additional work to process as done to system after recorded via pen and paper
- Building access control system outdated
+ Roles and responsibilities clear with the company management
+ Employees are a valued asset whom are wanted to give insight to business process development
+ Employees are wanted to make part of digitalization project
+ Seeks and wants to continue cooperation with local companies, such as the factory access control system service provider
Past
+ History as a family company before acquired by the international conglomerate
- The base for salary is by piece rated which doesn't correspond to current way of working and base for salary
+ Old ERP has been in greater use in past
+ New ERP introduced by conglomerate company
+ IT experience on high level from previous work
+ Good long term relationships between employees and management


C4
Business maturity
Technological maturity
Social maturity
Future
+ Business growth through well functioning reporting
+ Maintenance history available for company use
+ Digitally handled reporting makes customer case traceability to a high level
+ Digitally handled employee hourly reporting will enable fast reporting and payroll process improvements
+ Through digital tools better allocation of workforce
+ Work wellbeing through reduced time on employee reporting
Status Quo
+ Business is established well with single style customers and large scale apartment building plumbing renovations
+ Business handling methods established
+ Reporting done mainly through pen and paper
- Customer location maintenance history partly only in the maintenance employees mind and partly on paper
+ Company has an accounting and invoicing software in use
+ Website in use
+ Currently in deployment phase of a project management system to be used in large scale plumbing renovation projects
+ Well established roles in company
+ Wants to engage employees more
+ Efficiency sought through digitalizing work
+ Networked, member of, or belongs to Reliable Partner (Tilaajavastuu), The Federation of Finnish Enterprises, and Finnish Association of HPAC Technical Contractors
+ Employee on operative management has coded himself a website for the needs of the company
+ Employee interest in coding and providing a solutions is supported by company
- Current IT does not support employee engagement
Past
+ CEO and CFO roles divided by company owning married couple
+ Experience level from business field is high
+ IT; hardware and software have been taken into use when seen necessary
+ Willing to do IT investments
- No plans or strategies for IT use
+ Management team has established good relationships and supports others interests
+ Functions as being a family company


C5
Business maturity
Technological maturity
Social maturity
Future
+ Business will be automated which will enable growth and freed resources
+ Growth through new rental cars acquisition
+ New rent locations in Turku region
+ New business partners offering discounts together with rental company
+ Customer Relations Management (CRM) system in use which will automate business functions
+ Cars are realtime tracked through IoT-solutions
+ Business functions such as time and kilometer adding are done via mobile app or other digital solution
+ Scalable online reservation/booking calendar
+ Vast partner deals with other companies to create more business through joint marketing
+ Social media coverage is performed with strategy as the main customer group uses social media
Status Quo
+ Two rental vans
+ Cars are rented via phone
+ Car claim and reclaim (rental and return) require personnel presence
+ Rent location is convenient
+ Booking calendar on company website
- Booking calendar is filled by owner (only employee) according to bookings made by phone
- No accounting or invoicing software
+/- Solo entrepreneur (One employee)
- No current business partner networks
- No social media coverage
Past
+ Business started in 2010 as a very small business to fund studies and student life
+ No legacy systems, calendar can be overwritten
- No IT knowledge
+ Word of mouth –marketing has provided good name and reputation
+ Students became the main customer group organically without strategy


C6
Business maturity
Technological maturity
Social maturity
Future
+ Multiple office locations in Finland; business growth
+ Employee recruitment
+ New equipment and warehouse locations
+ ERP system covering all business functions and serving e.g. reporting
+ Business continuity and growth through warehouse management system with asset management and inventory management
+ Automated and intelligent asset governance
+ Strategic planning
Status Quo
+ Long term growth as a business trend
+ Recruitment is ongoing
+ Equipment management is handled currently with MS Excel
+ Website renewed recently
+ Accounting / Invoicing software in place
+ ERP system selected and in deployment
- No warehouse, inventory, asset management system/solution in place
- No social media coverage
- No cooperation networks
+ New CEO in company willing to continue the IT development
+ Networked, member of, or belongs to Reliable Partner (Tilaajavastuu), The Federation of Finnish Enterprises, and supporter of the indoor air association (Sisäilmayhdistys ry)
Past
+ National forerunner in specialized field
+ IT investment willingness
- No IT strategy