GROWTH MANAGEMENT IN MICRO-ENTERPRISES

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OF OULU**

FACULTY OF TECHNOLOGY

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ABSTRACT
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Abstract

The goal of the thesis is to form a micro-enterprise-focused business maturity model which can later be used in the SoloENTRE project to develop digital tools and new services for micro-entrepreneurs. This goal is fulfilled by using research data collected through a business maturity and growth management chapter, and systematic literature review, which follows the systematic research methodology defined in the thesis.

The goal of the business maturity and growth management chapter was to get an understanding of maturity models, business growth management and micro-enterprise growth management. This goal was fulfilled in the thesis, and conclusions were made from the business maturity and growth management chapter. The goal of the systematic literature review was to understand what kind of growth and business maturity models are presented in the literature. This goal was fulfilled by identifying 25 articles through the systematic literature review, which were then reviewed, and conclusions were made out of them.

Conclusions made from the business maturity and growth management chapter and the systematic literature review results were then used to form the micro-enterprise maturity model roadmap which was then followed to build the micro-enterprise maturity model structure. The micro-enterprise maturity roadmap is split into four steps, each with questions to be answered by the model creator. The roadmap can be applied to different business areas to build different kinds of maturity models.

According to the findings from the systematic literature review, the creation of the micro-enterprise maturity model structure was narrowed to be the goal of the thesis. The micro-enterprise maturity model structure is a five-level matrix structure, which has three key areas: customer relations, human resources, and operations which all have their own performance indicators. The structure is used in future in the SoloENTRE project to create a micro-enterprise maturity model questionnaire, method, and tool which can be used to develop new digital tools and new services for micro-entrepreneurs.

Additional Information
The thesis has been done in co-operation with the University of Oulu´s entrepreneurship Center of Excellence, MicroENTRE

TIIVISTELMÄ
OPINNÄYTETYÖSTÄ Oulun yliopisto Teknillinen tiedekunta

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Työn nimi			
Kasvunhallinta mikroyrityksissä			

Opintosuunta	Työn laji	Aika	Sivumäärä
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Tiivistelmä

Tämän diplomityön tavoitteena on muodostaa mikroyritys-keskeinen liiketoiminnan kypsyysmalli, jota voidaan myöhemmin käyttää SoloENTRE -projektissa uusien digitaalisten työkalujen ja uusien palveluiden kehittämisessä mikroyrittäjille. Tähän tavoitteeseen päästään käyttämällä tutkimustietoa, joka on kerätty liiketoimintakypsyys ja kasvunhallinta luvun sekä systemaattisen kirjallisuuskatsauksen kautta, joka seuraa diplomityössä määriteltyä systemaattista tutkimusmetodologiaa.

Liiketoimintakypsyys ja kasvunhallinta luvun tavoitteena oli saada ymmärrys kypsyysmalleista, liiketoiminnan kasvun hallinasta sekä mikroyritysten kasvunhallinnasta. Tämä tavoite täytettiin diplomityössä ja liiketoimintakypsyys ja kasvunhallinta luvun tuloksista tehtiin johtopäätökset. Systemaattisen kirjallisuuskatsauksen tavoitteena oli ymmärtää millaisia kasvun ja liiketoiminnan kypsyysmalleja esiintyy kirjallisuudesta. Tämä tavoite täytettiin tunnistamalla 25 artikkelia systemaattisessa kirjallisuuskatsauksessa, jotka sitten luettiin läpi ja joista sitten tehtiin johtopäätökset.

Johtopäätöksiä, jotka tehtiin liiketoimintakypsyys ja kasvunhallinta luvussa ja systemaattisen kirjallisuuskatsauksen tuloksista hyödynnettiin uuden mikroyrityskeskeisen kypsyysmallietenemissuunnitelman luomiseksi, jota sitten seurattiin mikroyritys kypsyysmallistruktuurin rakentamiseksi. Mikroyrityskeskeisen kypsyysmallietenemissuunnitelma jakaantuu neljään vaiheeseen, joista jokainen sisältää kysymyksiä joihin mallin luoja vastaa. Tätä kypsyysmallietenemissuunnitelma voidaan soveltaa eri liiketoiminta-alueilla erityyppisten kypsyysmallien rakentamiseksi.

Systemaattisen kirjallisuuskatsauksen tulosten perusteella, työn tavoite rajattiin mikroyritys kypsyysmallistruktuurin rakentamiseen. Mikroyritys kypsyysmallistruktuuri on viisitasoinen struktuuri, jolla on kolme avainaluetta: asiakassuhteet, henkilöstöhallinto sekä toiminnot, joilla kaikilla on omat tulosindikaattorinsa. Kypsyysmallistruktuuria käytetään tulevaisuudessa SoloENTRE -projektissa mikroyritys kypsyysmallikyselyn, -menetelmä sekä -työkalun luonnissa, joita voidaan käyttää digitaalisten työkalujen ja uusien palveluiden kehittämisessä mikroyrittäjille.

Muita tietoja
Tämä työ on tehty yhteistyössä Oulun yliopiston mikroyrittäjyyden tutkimusryhmän, MicroENTRE:n kanssa

PREFACE

The thesis was done in co-operation with the University of Oulu´s entrepreneurship Center of Excellence, MicroENTRE. The goal of the thesis was to build a new micro-enterprise focused growth maturity model that could be used as a part of the SoloENTRE project. The making of the thesis began in January 2019 and was originally planned to finish October 2019. However, the author balanced between the thesis and other work assignments at the MicroENTRE which delayed the thesis. Hence, the thesis came together in December 2019.

The thesis was completed with the full support from the MicroENTRE research unit, for which I am very grateful. Especially, I want to thank my supervisors Jaakko Kujala from the University of Oulu Industrial Engineering and Management department and Kai Hänninen from the MicroENTRE who remained helpful throughout the thesis. I want to thank also all of my other work colleagues at the MicroENTRE who motivated me throughout the process. It has been a pleasure to work with you.

Above all else, I would like to thank everyone who has taken part in my journey in the last 4.5 years in Oulu and years before it in Kokkola. I want to especially thank my father, mother, sister and two of our golden retrievers Tico and already deceased Herkules who have brought happiness to my life and motivated me to try my best in my life.

To be honest, before starting my studies and during my first years of studies in Industrial Engineering and Management, I wasn´t quite sure what I wanted to do after graduation or was my choice of the major even the right decision. However, I decided to test different things without a fear and go out of my comfort zone during my studies. Through this mindset, I have taken part in competitions, studies outside of my field, new hobbies, met new people, gone to overseas exchange and found new perspectives - to name some. I still don´t know what I want to do in the future. I´m like an amoeba: I´m going to many directions and changing my shape all the time but I´m not finding any focus. However, I don't see this as a bad thing as you are able to change the direction of your life and career time to time. Industrial Engineering and Management studies have equipped me with a comprehensive toolset that can be applied in many fields. Let us see where it and my mind take me next!

Oulu, 12.12.2019   Peetu Virkkala

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APPENDIXES:

ABBREVIATIONS AND DEFINITIONS

CMM   Capability Management Model

SME   Small and Medium-sized Enterprises

GDP   Gross Domestic Product

ME   Micro-Enterprise

SLR   Systematic Literature Review

TERMINOLOGY MATRIX

Due to recent terminology changes and differences between different courses of research, relevant terminology is first described in the context of the thesis (table 1).

Table 1: Terminology matrix

Term	Similar terms	Description	Reference
ME	Micro-firm, Micro-company	Company which has fewer than 10 employees and annual turnover less than two million euros	European Union Commission, 2003
Micro-entrepreneur	Micro-firm entrepreneur, Micro-company entrepreneur	A person who works in a ME. Usually micro-entrepreneur is the owner-manager of the micro-enterprise	European Union Commission, 2003
Owner-manager	Owner of the company	Person who both owns a business and manages it. MEs are run by one or two owner-managers	Burns, 2010; Greenbank, 2000
Maturity	Completeness Perfectness	A situation when something is reaching perfection or its goal.	Maturity: Meaning Of Maturity By Lexico, 2019
Maturity model	-	Well-defined, usually leveled model, which helps to improve maturity	Harmon, 2004
Mature company	-	Company´s results are achieved systematically through planning	Harmon, 2004
Immature company	-	Company´s results are achieved spontaneously or through non-systematic planning	Harmon, 2004

1 INTRODUCTION

Entrepreneurship is a significant part of countries´ national economy and in most countries, small and medium-sized enterprises (SMEs), form the spine of the national economy (Hänninen, 2018). Micro-enterprises (MEs), which are the subgroup of SMEs, form a significant part of Finland´s share of new enterprises and increase of new jobs (Official Statistics of Finland, 2019). However, Finnish ME´s share of international trade and establishment per person is low compared to other Nordic countries (Jaarsma, 2010; World Bank, 2019) which decreases Finland´s Gross domestic product (GDP). Improving the establishment rate of new MEs and developing skills of micro-entrepreneurs have a positive effect on Finland´s GDP and should, therefore, be one of the main goals of the Finnish government. (Saarela et al., 2018)

Like other entrepreneurs, micro-entrepreneurs should check from time to time how they are fulfilling their entrepreneurial goals to be able to determine if they should change their behavior to reach those goals (Lent & Brown, 2006). To do this check systematically, different kinds of growth and maturity models are often used (Fraser, 2002). The market is full of different types of maturity and growth models that are designed to be used in general or specific fields of business. Some of the growth models, like service and technology industry growth models, can be used also in the ME context with good results even thou they are designed as general models (Muhos, 2011). However, when it comes to maturity models, general maturity models tend to be too universal to provide real value for MEs. A specific ME focused maturity model could solve this problem, but there is none. (Falk et al. 2014)

This is problematic because even that most of the MEs want to stay small entrepreneur-oriented companies, they still want to develop their processes to an optimal level which could be achieved by using a maturity model (Järvi & Oinas 2009). Also, due to the changes in the business environment, the need for specific maturity models has increased which can also be seen in the ME business context (Saarela et al., 2018). Therefore, there is a need for a new maturity model in the ME context.

This thesis aims to fulfill this gap by forming a new ME-focused business maturity model that can be used to grow MEs businesses. The thesis is made for the University of Oulu´s Micro-entrepreneurship Center of Excellence, MicroENTRE. MicroENTRE is only micro-entrepreneurship focused research group in the Nordic Countries and in the Baltic Sea Region. MicroENTRE´s research themes include growth, internationalization and leading mechanisms of MEs, working environment and social impact of MEs, motivation, values, and diversity of MEs, and entrepreneurship education and entrepreneurship culture. (Micro-entrepreneurship Center of Excellence, 2019)

The thesis is part of MicroENTRE´s SoloENTRE project, which aims to strengthen the entrepreneurial orientation in North Ostrobothnia. SoloENTRE´s target group includes individuals who are planning to start a business, different forms of solo-entrepreneurs and public advisory services operating in North Ostrobothnia. SoloENTRE has three main goals which are:

Development of entrepreneurship environment of North Ostrobothnia

Development of new open entrepreneurship services in North Ostrobothnia

Development of new type of entrepreneurship peer-to-peer network in North Ostrobothnia

SoloENTRE can be divided into smaller subproject which are entrepreneurial climate, e-services, business services, peer network, and project management. The thesis focuses on the e-service subproject which can be further divided into growth management, digital readiness, and entrepreneurial culture parts. From these parts, the thesis focuses on the growth management part of the e-service subproject (figure 1).
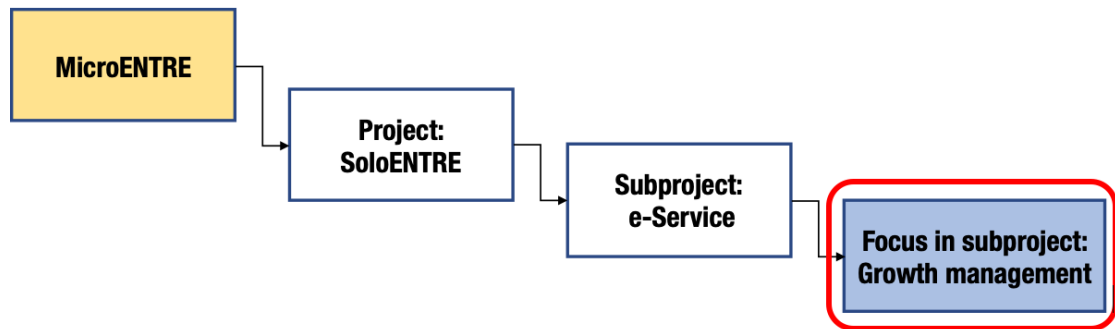
Figure 1: Focus of the thesis at MicroENTRE

1.1 Research goals

The goal of the thesis is to create a new maturity model for MEs, which can later be used in the SoloENTRE project to develop digital tools and new services for micro-entrepreneurs. The thesis has been split into one primary research question and three secondary research questions, which will be addressed throughout the thesis. The primary research question for the thesis is:

> *What kind of maturity model can help MEs in long-term growth and business management?*

To answer this question, we have to understand what kind of maturity models are used in growth and business management in enterprises, what kind of needs MEs have for maturity model and how the ME focused maturity model should be built and used. To get this understanding we set three secondary research questions. The secondary research questions for this thesis are:

> *What kind of growth and business maturity models are presented in literature?*
>
> *What kind of needs MEs have for growth and business maturity models?*
>
> *How growth maturity model should be built and used?*

These research questions are answered by conducting business maturity and growth management overview and systematic literature review (SLR), about the topic of the thesis and by analyzing their results.

1.2 Structure of the thesis

In summary, the thesis is structured as follows.

Chapter one, Introduction, describes research goals, structure of the research, and research focus. Research goals describe the goals of the research. Structure of the research describes the structure of the research. Research focus focuses on describing the research focus in detail.

Chapter two, Business maturity and growth management, describe maturity models, business growth management, MEs growth management, and make conclusions from them.

Chapter three, Systematic literature review research methodology, describes research method and Plan for the systematic literature review. Research method focuses on describing the research method used to business maturity and growth management chapter and the SLR. Plan for the systematic literature review describes the systematic research method used to conduct the SLR.

Chapter four, Selection of the article group, defines step by step how the article group for the SLR was defined. Research material, databases, keywords and search process for the SLR are defined. Finally, inclusion exclusion analyze, and category and visualization are conducted.

Chapter five, Analyze of the article group, introduces step by step how the article group defined in SLR was analyzed. Thematic analyze is conducted and the conclusions are made from thematic analyze.

Chapter six, Construction of ME focused growth maturity model, defines the scope of the thesis and the ME maturity model roadmap which is then followed to build the ME maturity model structure.

Chapter seven, Discussion, concludes the thesis. Contribution of the research is discussed; the thesis is evaluated and topics for future research are considered.

1.3 Research focus

As mentioned at the start of chapter one, the goal of the thesis is to create a new maturity model for ME context to be used in the SoloENTRE project. However, as definitions and terminology related to ME differ around the world, it's important to first describe them in detail in the context of the thesis to define a clear research focus.

The thesis uses EU definitions and terminology for MEs. According to the EU, ME is a company that has fewer than 10 employees and an annual turnover of less than two million euros (European Union Commission, 2003). A line has to be created between MEs and other types of companies to be able to compare them. Hence, we respectively use the EU definition for small, medium and large companies to describe these differences. According to the EU, labor input, workforce and turnover are some of the main differences between different types of companies (European Union Commission,

2003). Therefore, the company comparison matrix was created to visualize the differences between these different types of companies (table 2).

Table 2: Company comparison matrix (Lex Access To European Union Law, 2019)

Company type/size comparision			
Type of entrepreneurship	Labor input [x] (100%=one full time)	Workforce	Turnover
Micro-enterprise	x < 1000%	1-9 employee	≤ 2 m €
Small company	1000% < x ≤ 5000%	10-49 employee	≤ 10 m €
Medium company	5000% < x ≤ 25000%	50-249 employee	≤ 50 m €
Large company	x > 25000%	≥ 250 employee	≥ 50 m €

MEs can be divided even further when part-time, solo and employing enterprises are taken into account. Therefore, the expanded company comparison matrix was created (table 3).

Table 3: Expanded company comparison matrix (Lex Access To European Union Law, 2019; Landgraf, 2015)

Company type/size comparision				
Type of entrepreneurship	Labor input [x] (100%=one full time)	Workforce	Turnover	
Part-time entrepreneurship	x < 100%	1 employee	≤ 2 m €	**Different type of micro-enterprises**
Solo entrepreneurship	x ≤ 100%	1 employee	≤ 2 m €	
Employing micro-enterprise	100% < x ≤ 1000%	2-9 employee	≤ 2 m €	
Small company	1000% < x ≤ 5000%	10-49 employee	≤ 10 m €	**Different type of non-micro-enterprises**
Medium company	5000% < x ≤ 25000%	50-249 employee	≤ 50 m €	
Large company	x > 25000%	≥ 250 employee	≥ 50 m €	

In practice, when MEs and small companies are close to each other in terms of labour input, workforce or turnover, their business activities may be similar. Hence, the thesis defines small companies as a secondary focus of the ME maturity model, as the model may also provide value for these small companies. With this, a clear research focus was defined and visualized (figure 2).
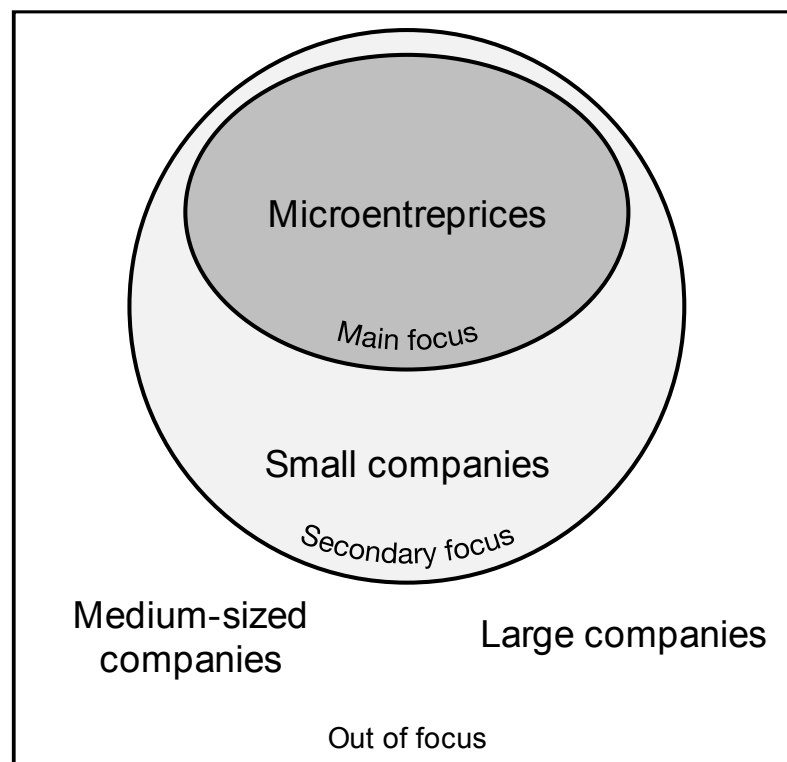

Figure 2: Research focus of the ME maturity model

2 BUSINESS MATURITY AND GROWTH MANAGEMENT

In chapter two, relevant terminology and findings from the business maturity and growth management were reviewed and analyzed.

2.1 Maturity models

Business maturity models provide information about a company´s current status and how to improve it. Business maturity models can be used as benchmarking tools to compare firms with each other to set development goals or as self-review frames and managerial tools for self-improvement action (Röglinger et al., 2012).

Each maturity model has at least one of the three application-specific purposes of use (Becker et al. 2009, Iversen et al. 1999). Model´s purpose of the use is descriptive if it is applied for assessment to investigate how criteria are fulfilled (Becker et al. 2009). Model´s purpose of the use is prescriptive if it tells how to identify desirable maturity levels and if it provided guidelines on maturity improvement measures (Becker et al. 2009). Finally, model´s purpose of the use is comparative if it allows internal or external benchmarking (de Bruin et al. 2005, Maier et al. 2009).

Maturity models have some weaknesses. Some critics say that maturity models are too step-by-step basic, simplistic and that they lack proper empirical foundation (Benbasat, 1984, King & Kraemer 1984, deBruin, 2005). Some critics say that maturity models are too abstract and non-practical to give real guidance on improving maturity (Lee, 2007, Röglinger et al. 2012, Curtis & Alden, 2007). Some of the further criticism against maturity models include concern about the multitude of similar maturity models, the dissatisfactory documentation of the maturity model design process and non-reflective adoption of CMM Blueprint which is seen as one of the cornerstones in traditional maturity model development process (Becker et al. 2009, Iversen et al. 1999).

Capability Maturity Model (CMM) is one of the first process maturity models, which was developed during the 1980s (Humphrey, 1988). CMM was originally developed for the field of software development, but it and its tools have been applied also to other fields and maturity models (Team, 2002). CMM describes the key elements of an effective software process. It contains the essential elements of effective processes and evolutionary maturity level improvement path. (Team, 2006)

CMM defines the maturity of the company´s processes with five levels: level one – initial, level two – managed, level three – defined, level four – quantitatively managed and level five – optimized (figure 3). Company´s goal is to follow CMM practices to improve the maturity level of its processes to reach the highest CMM process maturity level – level five. (Paulk, 1995)
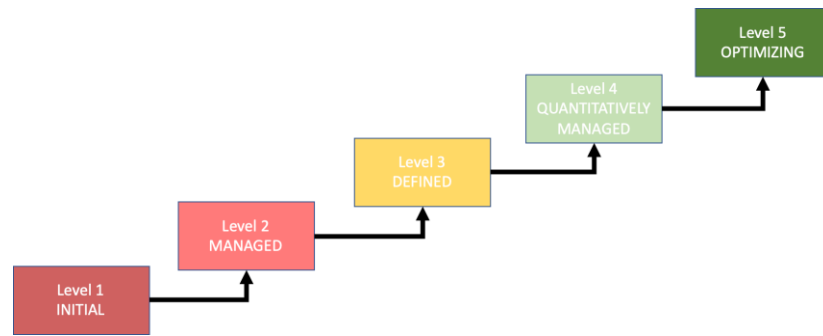
Figure 4: CMM Model (Paulk, 1995)

CMM was also used as a foundation for Capability Maturity Model Integration (CMMI)**,** which is a best-known process improvement training and appraisal program to help companies improve their processes across projects, divisions, and entire company through maturity assessments. CMMI consists of different maturity models that are integrated to form one diverse tool to address concerns from different fields of business. Some of the areas where CMMI can be used in companies include development, service and supplier management activities. Due to its scale and complexity, CMMI is used mainly in large companies. (Team, 2006)

In addition to traditional level-based maturity models like CMM, there are grid-based maturity models, also called maturity matrix models. Maturity grid models are typically structured around a matrix where levels of maturity are allocated against key areas of business performance to create cells which form the matrix structure (figure 5). (Maier, 2009)

	Maturity level 1	Maturity level 2	Maturity level 3	...	Maturity level n
Key area 1	Key area 1 - Maturity level 1 requirements	Key area 1 - Maturity level 2 requirements	Key area 1 - Maturity level 3 requirements	...	Key area 1 - Maturity level n requirements
Key area 2	Key area 2 - Maturity level 1 requirements	Key area 2 - Maturity level 2 requirements	Key area 2 - Maturity level 3 requirements	...	Key area 2 - Maturity level n requirements
...	...	...	...	...	...
Key area n	Key area n - Maturity level 1 requirements	Key area n - Maturity level 2 requirements	Key area n - Maturity level 3 requirements	...	Key area n - Maturity level n requirements

Figure 5: Example of maturity grid structure

Instead of focusing on specific processes, maturity grids can be applied to companies in different industries. Maturity grids don´t specify how processes should look like, instead, they identify the characteristics which every company and their processes should have to design and deploy high-quality processes. Traditional level- or stage-based maturity models tend to be part of certificated packages like CMMI which bounds companies to use them in many business areas. Maturity grids in other hand tend to be less complex and non-certificated models that companies can use freely in parallel with their other improvement initiatives. (Hammer, 2007)

2.2 Business growth management

ME growth management is one of the key topics of the thesis. However, in scientific research, it´s not always clear what business growth means (Weinzimmer et al., 1998). Growth measurement factors are inconsistent between scientific publications and it's hard to define one unifying approach to business growth (Delmar, 1997). Hence, it's important to define growth and business growth in the scope of the thesis.

Growth is a change process occurring over time and is usual multidimensional in nature (Wiklund, 1998; Delmar et al., 2003). Correspondingly, business growth is an action, a process or a manner of growing within a company (Hanks & Chandler, 1992). Companies can grow at different pace with a different regularity (Davidsson et al., 2005). Fast growth companies grow fast through planned growth patterns and are able to make quick changes in their production activities. (Smallbone, 1995).

The change process leading to business growth can be analyzed from different perspectives. On a general level, the nature of the change can be seen as a pervasive and continuous phenomenon while in the other hand as a discrete and episodic phenomenon (Coad, 2007). Change can also be seen as a permanent feature of a company emerging from the complex interactions of individuals within a company and the evolving environment (Tsoukas & Chia, 2002). Finally, change can be seen to be fundamentally inert or punctuated part of the company (Hannan & Freeman, 1984). Each of these perspectives highlights one dimension of change and can be utilized depending on the viewpoint of the study, therefore the definition of growth naturally changes according to the selected viewpoint (Muhos, 2011). In addition, whether a growth study is qualitative or quantitative in its nature, the study should follow the company´s growth processes longitudinally as the company evolves (Davidsson et al., 2005).

Growth can be measured by using different growth indicators which can be divided further to objective and subjective indicators. Objective indicators are measured objectively from the data whereas subjective indicators are measured subjectively from a specific viewpoint. (Delmar, 2006) Growth indicators can be used in many ways. Company growth can be investigated by using one indicator, by using multiple indicators at the same time or by using multiple indicators separately (Davidsson et al., 2005; Delar et al., 2003)

Turnover, employment, performance, market share, and assets are the most utilized growth indicators in the business environment. turnover and employment are the most referred indicators in business research. Growth measurements, employment, sales, and assets are objective indicators whereas market share and performance are subjective indicators. (Delmar, 2006)

According to research, company growth doesn´t follow any typical pattern. Instead, companies have different growth patterns and types of growth which can be achieved through different activities (Delmar et al., 2003; Davidsson et al., 2005). For example, organic growth is mostly associated with non-diversifying companies, whereas growth through acquisition is mostly associated with diversifying companies (Coad, 2007). Other growth patterns include growth-oriented and stability-oriented companies (Hakim, 1989), high growth and slow growth companies (Delmar, 1997), high performing and low performing companies, (Van de Ven et al., 1984) and growth ventures and no growth ventures (Peters & Brush, 1996).

Small company growth has its own characteristics which can be applied also to MEs. Small companies have high entry and exit rates and their average growth rate is high. Small companies' growth correlates directly with their pursuit of profits and survival. However, their growth doesn´t correlate year to year as the growth of the small companies tends to be unequal. There are only a few innovators in small companies as most of the companies just follow the existing market. However, small companies are capable to thrive in the submarkets, niches, much better than large companies which provides them unique growth opportunities. (Coad, 2007)

2.3 MEs growth management

MEs subchapter divides into three subparts: Basic characteristics of MEs, Managerial activities in MEs and other findings from previous micro-entrepreneurship growth research.

2.3.1 Basic characteristics of MEs

MEs are a heterogeneous group of small, owner-manager centric companies. They include start-up companies, family businesses and self-employed owner-managers with a small workforce. (Forsman, 2008; Devins et al., 2005). Young age, strong growth rates, and high exit rates are some of the most well-known factors of MEs (Falk *et al.,* 2014).

MEs are usually unwilling to grow, but when they grow, they are willing to accept greater risks than larger companies (Gherhes et al., 2016; Perrez-Cano, 2013). Due to their small size, MEs are flexible and able to discover new opportunities fast that enable them to grow (Escriba´-Esteve et al., 2008; Steffens et al., 2009). Due to their unpredictable nature, it´s common that MEs revise their business models often as they grow. (Johnson et al., 2008)

MEs are more likely to use family members in their managerial activities than larger companies. Their original founders have a greater influence on the company compared to larger companies. MEs are less likely to create succession plans; their financial management methods are underdeveloped, and they use less external professional services like consulting and advising compared to larger companies. They are managed in an informal manner compared to larger companies. (Lussier & Sonfield, 2015)

MEs have many benefits compared to larger companies. They have more flexibility to enter and exit foreign markets and they adapt to environmental changes quicker than larger companies (Jokela et al., 2017). They contribute to new job creation on a bigger

scale than larger companies, therefore having an important role in innovation and economy. (Storey, 1994; Saarela et al., 2018)

MEs have also many disadvantages compared to larger companies. Due to their small size, they often suffer from resource scarcity which leads to financial and expertise constraints (Kelliher & Reinl, 2009; Nikunen et al., 2017). Expertise constraints lead often to time management challenges as the employees are required to have a lot of commitment to work and do long working days to keep business running. This unbalanced workflow and manpower shortage, in addition to underdeveloped capabilities in key business areas, personnel capabilities and business support provisions, may lead to inadequate long-term business planning and growth. (Gherhes et al. 2016; Hänninen et al., 2017)

Digitalization, conversion of text, pictures, or sounds into digital form, is connected to MEs´ growth, performance, and competitiveness (Taiminen & Karjaluoto, 2015). MEs´ exporting barriers have lowered due to digitalization. As a result, MEs' share of total exports has increased rapidly in many countries. (Jokela et al., 2017) However, MEs utilize digital tools less likely than larger firms. They lack a long-term focus on digital solutions. From the tools MEs use, website is the most important sales tool and E-mails are the most important customer relationship management tool. (Nikunen et al., 2017)

2.3.2 Managerial activities in MEs

MEs are managed in an informal and personalized way mainly by one or two owner-managers who tend to work at both the managerial and operational levels in the ME (Burns, 2010; Greenbank, 2000). ME owner-managers are usually less organized in their managerial activities than managers in larger companies. They tend to utilize the information they have subconsciously and informally absorbed to make decisions instead of following specific rules. Due to the small size of their companies, there is usually no separation between control and ownership in these managerial activities. (Greenbank, 2000)

In addition to size and turnover, owner-manager centricity is one of the main factors which distinguish MEs from traditional SMEs (Gherhes et al. 2016). Owner-manager or owner-managers play a pivotal role in the success of ME as the culture of a ME is largely an extension of its owner´s personality. (Burns, 2010; Kelliher & Reinl, 2009). Owner-managers usually have almost full authority over MEs´ growth goals, strategic decisions and resource allocation (Heikkinen, 2007).

Owner-managers are often the most important resource within a ME, and their commitment to growth is critical to ensure ME´s performance and growth (Smallbone et al., 1995; Mazzarol et al., 2009; Hansen & Hamilton, 2011). Due to these responsibilities, owner-managers may have pressure to be experts in all fields of management as the personal objectives and characteristics of owner-managers becomes essential elements of ME´s success (Clark & Douglas, 2014).

Owner managers´ decision making is extremely complex and results from the interaction in an individual, social, and economic context. The individual context involves owner-managers´ learned behavior, abilities, and beliefs. The social context entails owner-managers education, past employment, and membership in professional or trade organizations. And the economic context involves the economic needs and desires of the owner-manager. (Greenbank, 2000)

Managerial planning, cost analysis, and marketing research are rarely used in MEs (Greenbank, 2000). MEs´ networks are often smaller than networks of larger companies. Hence, MEs are less aware of business opportunities like export-promotion programs than larger companies. (Kumcu et al. 1995; Köksal, 2009)

2.3.3 Other findings from previous ME growth research

ME research has identified multiple factors that affect the growth of the MEs. Friar`s & Meyer´s (2003) case research revealed that owner-managers of high-growth MEs had significantly higher levels of work experience or advanced training in their industries and technologies compared to other MEs. They also identified that high-growth MEs´ business plans were usually developed by teams rather than individuals. (Friar & Meyer, 2003)

Resource scarcity leads to creative decisions in small companies. According to Tornikoski et al. (2011), focusing on fulfilling company´s key processes and outsourcing non-key processes, hiring professional leaders and managing of company´s social networks improves significantly small companies' ability to grow and maintain growth (Tornikoski et al., 2011). In addition, Jokela et al. (2017) identified that exporting MEs turnover was larger than non-exporting MEs which indicates that the ability to export is connected to ME´s ability to grow. Exporting MEs were older and had a clearly larger share in the manufacturing sector and trading sector compared to non-exporting MEs. (Jokela et al., 2017)

Hänninen et al. (2017) identified that business model development, improved sales and marketing activities, new customer segments, networking, and improved network utilization can help MEs to grow. They also identified functions that didn´t have a significant effect on ME growth. These included the development of new products and services, personal development and training, investing in leadership skills, production capacity enhancements and digitalization development activities. (Hänninen et al., 2017)

Perren (1999) researched the growth of MEs through case studies. He developed a growth framework structure according to 16 business case studies (figure 6, figure 7). The framework identifies sixteen independent growth factors that are part of four interim growth drivers which affect the growth of MEs.
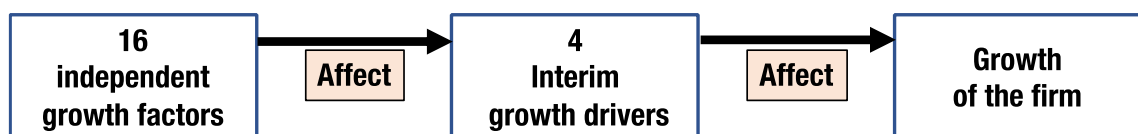

Figure 6: Growth framework structure on a general level, modified from Perren (1999)

Factor #	Name of the factor
1	Desire to be one´s own boss
2	Desire to succeed
3	Active risk taker
4	Innovation
5	Transferable personal capital
6	Transferable primary skills
7	Transferable support skills
8	Transferable network of contacts
9	Family, investing, friends, etc.
10	Key employees and partners
11	Active professional advisers
12	Debtors and creditors
13	Societal and other outer factors
14	The state of economy
15	Competitive dynamics

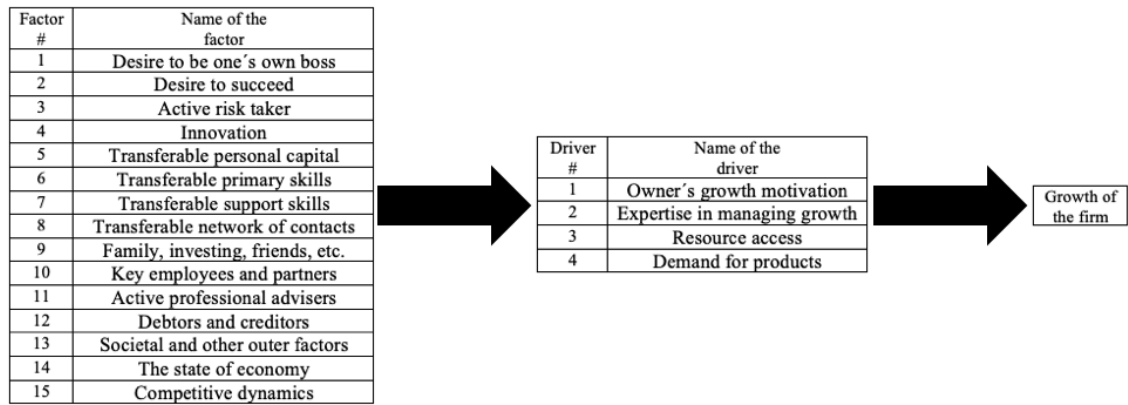| Driver #	Name of the driver
1	Owner´s growth motivation
2	Expertise in managing growth
3	Resource access
4	Demand for products

Growth of the firm

Figure 7: Growth framework structure on a detailed level, modified from Perren (1999)

Higher growth factor scores in the case companies implicated better readiness to grow the company. The case studies revealed features and actions which help MEs to increase their growth factor scores (table 4). Some of these features and actions were internal which MEs could affect, and some were external which MEs couldn´t affect. (Perren, 1999)

Table 4: Features and actions which increase growth factors (Perren, 1999)

#	Growth factor	Type	Features and actions which help to increase growth factors
1	Desire to be one´s own boss	Internal	Independency and risk aversion
2	Desire to succeed	Internal	Strong desire to succeed Decisions making according to firm´s focus
3	Active risk taker	Internal	Willingness to accept personal financial risks Willingness to accept risk of challenging orders
4	Innovation	Internal	Ability to search and spot market opportunities
5	Transferable personal capital	Internal	Use of own personal capital
6	Transferable primary skills	Internal	Prior knowledge of technical aspects of firm's core tasks Prior negotiation skills
7	Transferable support skills	Internal	Previously developed skills
8	Transferable network of contacts	Internal	Access to adviser who has set similar type of firm Personal supplier contacts Access to risk-capital Prior customer contacts
9	Family, investing, friends, etc.	Internal	Owner-manager´s family support
10	Key employees and partners	Internal	Access to supporting individuals Access to low cost and flexible employees Access to employees with sale abilities Access to employees´ contact
11	Active professional advisers	Internal	Access to professional advisers
12	Debtors and creditors	External	Access to suppliers who offer special terms Supportive bank Quick paying customers Good debtor management

13	Societal and other outer factors	External	Specific positive changes (local policing etc.) Demographic changes Technology development
14	The state of economy	External	Growth of economy Specific deregulation
16	Competitive dynamics	External	Good product/service margin/volume balance

Most of the features and actions were aimed for ME owner-managers as they play a critical part in MEs´ success. Hence, for each growth factor, Perren (2000) also identified how ME owner-managers could affect that growth factor. This led to the categorization of growth factors (figure 8). Perren identified three types of growth factors: factors that require self-awareness from owner-manager, factors which owner-manager has only little control and factors which owner-manager has more control. (Perren, 2000)
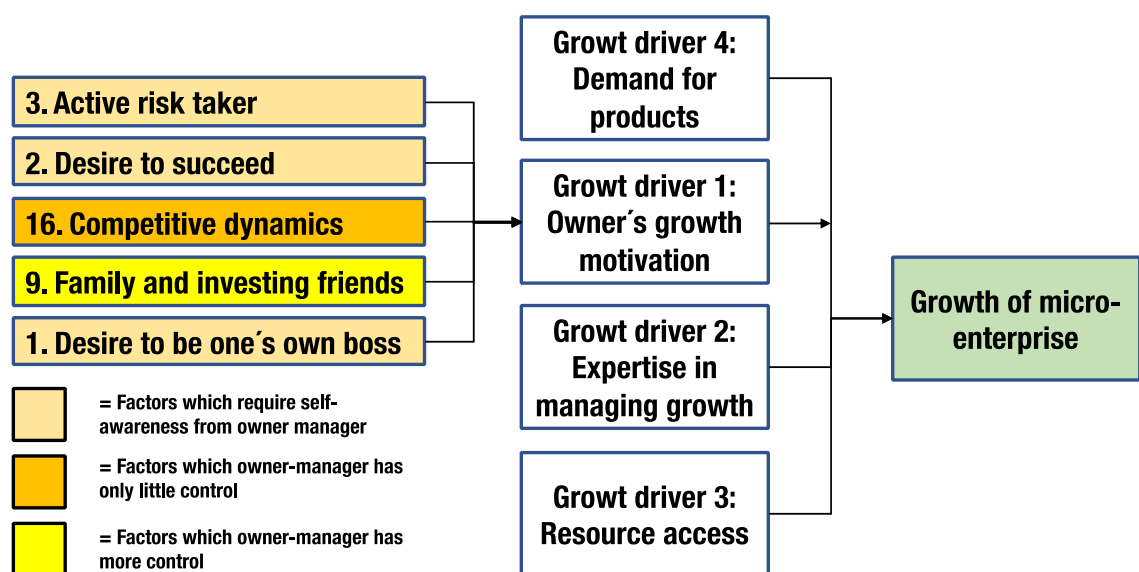
Figure 8: An example of categorization of growth factors, modified from Perren (2000)

Finally, to evaluate growth factors in the case companies, Perren (2000) created a diagnostic toolkit, a question pattern, for growth factors (table 5) which was used to identify the growth factors and corresponding features and actions which MEs should focus on to increase their growth. (Perren, 2000)

Table 5: An example of diagnostic toolkit question pattern for growth factor: "2. Desire to succeed" (Perren, 2000)

# and name of the growth factor	Diagnostic questions for ME owner-manager
2. Desire to succeed	- What are your hopes for your business over the next ten years? - What are your business ambitions? - How do you measure business success? - How important is business growth to you compared with your other measures of business success? - How important is having a personal control of most aspects of the business to you?

As a part of MicroENTRE´s previous TUTOES ("Tuotannollisen toiminnan kehittämisen esiselvitys oulun eteläisessä") project, business process maturity model was created and tested on companies with 1-700 employees. Results of this project revealed aspects that should be taken into account if the business process maturity model would be developed forward or if the new ME focused maturity model would be developed in the future. According to the results, tested MEs felt that teamworking related questions were irrelevant in business process maturity assessment. This is supported by the fact, that in MEs one person is usually responsible for many core processes due to the small size of the company. Furthermore, MEs felt process definitions, team-based process management and employee's extensive assessment of competence as non-essential parts for ME business process maturity. These results highlight that ME focused model should focus less on processes and teamwork to better fulfill micro-entrepreneurs´ needs. (Kropsu-Vehkaperä et al., 2015)

Research has also identified challenges that MEs face and which should be answered in the future. In their statement, European Commission stated that SMEs and smaller companies have challenges which limits their opportunities, and which should be taken into account in governmental and EU decision making (table 6). (Muller et al., 2017) Even thou these concerns can be mainly answered only through governmental actions, tools like maturity models could help to minimize the effects of these challenges.

Table 6: Challenges which SMEs and smaller companies face, modified from Muller et al. (2017)

Administrative burdens	Regulatory burdens	Lack of skilled workers
Taxation	Access to capital	Access to public procurement contracts
Access to single markets	Access to EU programs	Unfair or too strong competition
Access to information	Late payments	Access to international markets
Access to advice	Energy costs	Instability of the world economy

Researchers have also presented multiple development proposals to boost the growth of MEs. On the operational level, Nikunen et al. (2017) proposes that MEs should use modern, integrated digital tools to improve customer relationships. Currently, MEs focus more on acquiring customers when the focus should be set more on customer preferences to commit existing customers and retain their loyalty. (Nikunen et al., 2017)

Nikunen et al. (2017) also points out that MEs should gather more knowledge and specialized workforce to focus on marketing tools and ensure that their marketing strategy is systematic, persistent and compatible with mobile marketing (Nikunen et al., 2017). Finally, according to Muhos et al. (2018) growth oriented MEs should also focus on human resources as one of the main areas of development. They also point that training and advisory services should be provided to ME owner-managers to enhance their company- and self-management, and wellbeing abilities. (Muhos et al., 2018)

2.4 Conclusion

The thesis uses EU definition for micro-entrepreneurs and MEs. According to findings in subchapter 2.3, the thesis uses term owner-manager as a synonym to owner or owners of ME.

According to subchapter 2.1, the author sets goal to build maturity model which has descriptive, prescriptive and comparative application-specific purposes of use. From these, we see the descriptive and prescriptive purposes of use as most important because they ensure that ME can review maturity model and get guidelines for their processes.

When stage- and matrix-based maturity models are compared, it seems that matrix-based model could fit our needs better than one-dimensional model. There are many reasons for this. First of all, maturity matrix can be applied to companies in different industries. This is good because MEs are defined by size and turnover – therefore they include companies from many different industries. Secondly, maturity matrix helps to identify characteristics which every company and their processes should have to design and deploy high-quality processes. This too fits our needs as we are creating maturity model which is meant to all of MEs. Finally, maturity matrixes tend to be less complex and more flexible to use compared to stage-based models and other improvement initiatives. This is a good thing for MEs as they managerial activities tend to be informal and unpredictable.

According to subchapter 2.2, we define business growth as an action, a process or a manner of growing within a company. We define growth as a change leading to mature processes. From different approaches to the nature of change, we use Tsoukas & Chia (2002) approach: we see change as a permanent feature of a company emerging from the complex interaction of individuals within a company and the evolving environment. Hence, the model should aim to help companies to plan their approach to these complex interactions and evolving environment. The chapter discussed also different objective and subjective growth indicators. The indicators which we use in the model will be defined later in chapter six according to the synthesis from the business maturity and growth management overview and the SLR.

2.3 subchapter has a lot of material which helps us to answer the research questions. According to basic characteristics in MEs sub-part, MEs´ decision making, resource allocation, and commitment have unique characteristics. These findings suggest, that the maturity model should be flexible and provide tools that enable ME to increase predictability and long-term focus in their business.

According to subpart 2.32, MEs are managed mainly by one or two owner-managers who tend to work at both the managerial and operational levels in the company. Owner-managers have huge responsibilities, as they have almost full authority over MEs´ growth goals, strategic decisions, and resource allocation. These and other findings from the sub-part suggest that the model should be created to be used by owner-managers. The model should support owner-managers in their decision making and help them to develop and acquire managerial skills.

According to subpart 2.33, there are factors that improve MEs´ ability to grow and maintain growth and factors that don´t have a significant effect on the growth of ME. The use of these factors in the model will be discussed later in chapter six. Sub-part´s findings from Perren (1999) present great approaches to MEs growth management: Growth factors, aspects which may have a positive influence on growth factors and growth drivers are consistent. Dividing growth factors according to owner-manager´s ability to affect them helps the owner-manager to focus his or her development. Finally, the diagnostic toolkit question pattern is a great frame to analyze MEs´ current status.

Subpart 2.33 also revealed that some parts of traditional maturity models are seen as non-essential by micro-entrepreneurs. The use of these parts in the model is considered later in chapter six. From EU´s SME and smaller company challenges presented in the subpart, access to information, advice, skilled workers and international markets seem to be challenges where the model could have at least indirectly effects. Finally, the subpart presented areas where MEs should focus more. According to this, areas like customer experience, human capital, marketing, training, and digital tools could be some of the areas which could be taken into account in the model.

Overall, results from the business maturity and growth management overview provide lot of findings that are reviewed later together with the findings from the SLR. These findings help to build answer to main research question: "What kind of maturity model can help MEs in long term growth and business management?" and to secondary research question "What kind of needs MEs have for growth and business maturity models?". Answers to these and other research questions are summarized later in chapter seven.

3 SYSTEMATIC LITERATURE REVIEW RESEARCH METHODOLOGY

Business maturity and growth management overview was conducted first to acquire preunderstanding about maturity models and ME growth management. This information was then used to create search boundaries for the SLR and to make conclusions together with findings from the SLR to form a new ME focused growth maturity model.

3.1 Research method

The SLR follows the overview of the literature. Its goal was to systematically identify relevant growth and business maturity models from the literature. Compared to typical way to conduct literature review, SLR has unique characteristics. It is based on the clearly formulated question, it identifies relevant studies and appraises their quality, and summarizes evidence by use of an explicit methodology (Khan et al., 2003). It identifies all research around research questions with specific criteria to give an unbiased and balanced summary of the literature around the topic. Compared to typical way to conduct literature review, SLR´s advantage is the explicit presentation of the method of search, appraisal, synthesis and analysis of the literature. SLR is well suited to reduce bias, identify gaps in the literature and generate recommendations for future research. (Grant & Booth, 2009)

SLR method was used in maturity model identification to get a comprehensive picture of growth and management maturity models used in literature. As there is a lot of general and specific maturity models in the literature, getting a comprehensive and heterogenic sample from them is important to ensure that the results can be applied to different types of MEs. SLR helps in gathering comprehensive and heterogenic sample by minimizing selection and data extraction bias. The selection bias (author chooses only the research material which is consistent with their personal research goals and opinions) is minimized in SLR by defining clear inclusion and exclusion criteria for literature review prior the review (Liberati et al., 2009). The data extraction bias (author takes too much or too little data from included studies) is minimized in SLR by extracting research findings with a standardized form and reviewing them at minimum by two reviewers. (Nigtingale, 2009, Liberati et al., 2009). In short, the use of SLR adds credibility to the results of the thesis.

3.2 Plan for the systematic literature review

To conduct good SLR, high-quality entrepreneurship-related peer-reviewed journals were first examined to identify best practices of SLR in the field of entrepreneurship research. AJG 2018 – Association of Business Schools Academic Journal Quality Guide 2018 and ABDC 2016 – Australian Business Deans Council Journal Rankings List 2016 were used to identify high-quality peer-reviewed entrepreneurship journals. Small Business Journal (AJG score: 3, ABDC score: A), Journal of Small Business Management (AJG score: 3, ABDC score: A), Journal of Business Venturing (AJG score: 4, ABDC score: A*), Entrepreneurship and Regional Development (AJG score: 3, ABDC score: A) and Entrepreneurship, Theory and Practice (AJG score: 4, ABDC

score: A*) were identified as examples of high-quality peer-reviewed journals in the field of entrepreneurship research. Sample of SLR articles was read from these journals and findings from them were used to define systematic research methodology for the thesis (table 7).

Table 7: Systematic research methodology for the thesis

SELECTION OF THE ARTICLE GROUP (Chapter four)

Step #	Step description
Step 1A	Use of SLR is reasoned
Step 2A	Research material and databases are defined
Step 3A	Keywords and search processes are defined
Step 4A	Inclusion exclusion analyze process is conducted
Step 5A	Categorization and visualization are conducted

ANALYZE OF THE ARTICLE GROUP (Chapter five)

Step #	Step description
Step 1B	Thematic analyze is conducted
Step 2B	Conclusions are made from thematic analyze

Systematic research methodology was followed through the chapter four and the chapter five to answer set research questions together with the findings from the chapter two. Success of the SLR is later reviewed in the chapter seven.

4 SELECTION OF THE ARTICLE GROUP

This chapter introduces step by step how the article group for the SLR was defined. Step 1A "Use of SLR is reasoned" was addressed already in sub-chapter 1.2. Hence, it is skipped, and the introduction starts from Step 2A.

4.1 Definition of research material and databases (Step 2A)

In step 2A, research material and databases were narrowed. The focus of the research material was narrowed to established peer-reviewed journal articles. Peer-reviewed journal articles are considered as well-validated knowledge and they are more likely to have a bigger impact in scientific research than non-peer-reviewed articles (Podsakoff et al., 2005).

The focus of the databases was narrowed to Scopus and Web of Science. These databases are considered as the most extensive academic databases for knowledge in the scientific field and they fit well to business and engineering-related journal searches. (Guz & Rushchitsky, 2009)

4.2 Definition of keywords and search process (Step 3A)

In step 3A, first, keywords and search process were defined, and finally, the search was conducted.

As the starting point, the keyword search was narrowed to titles, abstracts, and keywords of the final versions of scientific articles published in peer-review journals which were written in English. By following these rules, test searches were conducted in Scopus and Web of Science to understand the scale of the topic. Following list of keywords was used to conduct the first test search (* indicates different inflections at the end of keywords).

> *Maturity, model*, growth model*, ME*, micro-entrepreneur*, microenterprise*, microentrepreneur*, small compan**

Conjugation "OR" was used between the keywords in the list to look at least one of the keywords from articles´ titles, abstracts, and keywords.

After observing the results from the first test search, more keywords were identified. Following keywords were added to the second test´s search list:

> *Maturity matrix*, maturity grid*, process maturity, organizational maturity, process capablit*, process maturity, maturity of organization capablit*, stage model*, micro-business*, owner-manager**

After observing the results of the second test search, even more keywords were identified. Following keywords were added to the search list:

> *Maturity framework*, maturity level*, Small organizatio*, small firm*, small business*, small enterprise*, SME*, Small and medium-sized enterprise*, small and medium-sized firm*, small and medium-sized organization*, large business*, large firm*, large organization*, large enterprise*, business, firm*, organizatio*, enterprise*, stage framework*, stage matrix*, stage grid*, stages of growth*, organic growth, acquisition growth, growth-oriented, stability-oriented, high growth firm*, slow-growth firm*, high performing, slow performing, growth venture*, no growth venture*, states of growth, stages-of-growth, growth priori*, growth potential, growth management, growth capabili**

In total, the search list included now following keywords:

> *Maturity, model*, growth model*, ME*, micro-entrepreneur*, microenterprise*, microentrepreneur*, small compan*, Maturity matrix*, maturity grid*, process maturity, organizational maturity, process capabilit*, process maturity, maturity of organization capablit*, stage model*, micro-business*, owner-manager*, Maturity framework*, maturity level*, Small organizatio*, small firm*, small business*, small enterprise*, SME*, Small and medium-sized enterprise*, small and medium-sized firm*, small and medium-sized organization*, large business*, large firm*, large organization*, large enterprise*, business, firm*, organizatio*, enterprise*, stage framework*, stage matrix*, stage grid*, stages of growth*, organic growth, acquisition growth, growth-oriented, stability-oriented, high growth firm*, slow-growth firm*, high performing, slow performing, growth venture*, no growth venture*, states of growth, stages-of-growth, growth priori*, growth potential, growth management, growth capabili**

Next, the search list was divided into topic group pairs to streamline the test search process. Four topic groups were identified: "Models", "Company definitions", "Entrepreneur definitions" and "Maturity areas", and keywords in the search list were divided into them. However, after discussing more about the topic of the thesis with the thesis supervisors, the topic groups were reconstructed again. This led to the identification of three topic groups: "Maturity related", "Company related" and "Growth related" (Figure 9).

This change was done, because topic groups "Entrepreneur definitions" and "Maturity areas" from the original topic groups were identified as inefficient and narrow, as the articles that included entrepreneur terminology usually already included company related terminology. Also, it was hard to define "Maturity areas" topic group, because the related terminology hasn´t been established well in the literature. Hence, the following keywords of these topic groups were removed from the search list:

> *Micro-entrepreneur*, microentrepreneur*, owner-manager** (Topic group: Entrepreneur definitions)

> *Process maturity, organizational maturity, process capability, process maturity, maturity of organization capability* (Topic group: Maturity areas)

Topic group 1: **Maturity related search words**
maturity model*, maturity matrix*, maturity grid*, maturity framework*, maturity level*

Topic group 2: **Company related search words**
small organisatio*, Small organizatio*, small enterprise*, SME*, Small and medium-sized enterprise*, small and medium-sized firm*, small and medium-sized organization*, small and medium-sized organisatio*, large organisatio*, *large business, large firm*, large organization*, large enterprise*, business, firm*, organisatio*, organizatio*, enterprise*

Topic group 3: **Growth related search words**
"stage framework*", "stage model*", "stage matrix*", "stage grid*", "growth model" "stages of growth", "Organic growth", "Acquisition growth", "growth-oriented", "stability-oriented", "high growth firm*", Slow-growth firm*", "high performing", "slow performing", "growth venture*", "no growth venture*", *"states of growth", "stages-of-growth". "Growth priori*", "Growth potential", "Growth management", "Growth capabilities"*

Figure 9: Three topic groups that were reconstructed from original four topic groups

The three topic groups were then combined to topic group pairs, each consisting of two of the topic groups. By taking all of the topic group combinations into account, topic group pairs "Maturity-Company", "Maturity-Growth" and "Company-Growth" were defined (figure 10).

Topic group pair 1: (Maturity – Company)
Topic group 1 & topic group 2

Topic group pair 2: (Maturity – Growth)
Topic group 1 & topic group 3

Topic group pair 3: (Company – Growth)
Topic group 2 & topic group 3

Figure 10: First set of topic group pairs

After discussing more about the topic group pairs with the thesis supervisors, we identified that topic group pair "Company-Growth" led mainly to articles which didn´t consider maturity on their title or abstract level, and if maturity was considered in titles or abstracts, those articles were usually also found by conducting test searches with topic groups "Maturity-Company" and "Maturity-Growth". Hence, we decided to exclude topic group pair "Company – Growth" from the topic group pairs (figure 11).

Topic group pair 1: (Maturity – Company)
Topic group 1 & topic group 2

Topic group pair 2: (Maturity – Growth)
Topic group 1 & topic group 3

Figure 11: Final set of topic group pairs

When the test searches were conducted with the final topic group pairs, conjugation "OR" was used between the keywords inside the topic groups and conjugation "AND" was used between the topic group pairs (figure 12).

(("maturity model*"OR "maturity matrix*" OR "maturity grid*" OR "maturity framework*" OR "maturity level*") AND (ME* OR microenterprise* OR "small compan*" OR micro-business* OR "SME*" OR "Small and medium-sized enterprise*" OR "Small and medium-sized compan*" OR "Small and medium-sized firm*" OR "Small and medium-sized organizatio*" OR "Small enterprise*" OR "Small business*" OR "Small firm*" OR "Small organizatio*" OR "Large business*" OR "Large firm*" OR "Large organizatio*" OR "business*" OR "firm*" OR "organizatio*" OR "Small and medium-sized organisatio*" OR "Small organisatio*" OR "large organisatio*" OR "organisatio*" OR "Small and medium-sized enterprise*" OR "small enterprise*" OR "large enterprise*" OR "enterprise*")) OR ((" maturity model*"OR "maturity matrix*" OR "maturity grid*" OR "maturity framework*" OR "maturity level*") AND ("stage framework*" OR "stage model*" OR "stage matrix*" OR "stage grid*" OR "growth model" OR "stages of growth" OR "Organic growth" OR "Acquisition growth" OR "growth-oriented" OR "stability-oriented" OR "high growth firm*" OR "Slow-growth firm*" OR "high performing" OR "slow performing" OR "growth venture*" OR "no growth venture*" OR "states of growth" OR "stages-of-growth" OR "Growth priori*" OR "Growth potential" OR "Growth management" OR "Growth capabilities"))

Figure 12: Test search argument by using final topic group pairs with "OR" and "AND" conjugations

Just from Scopus, the search argument found 1080 articles. This was still a huge group of articles compared to most of the article groups of SLRs we analyzed before, and it still included a lot of irrelevant articles on title and abstract level. To focus the search further, we decided to add search arguments "(growth* OR management)" and "(simulatio OR evalution OR mode* or Analy* OR assesment)" with "AND" conjugation to the search argument. These search arguments were chosen to focus the search to articles, where a new maturity model was introduced or tested. This led to the final search list used in the thesis (figure 13).

TITLE-ABS-KEY((("maturity model*"OR "maturity matrix*" OR "maturity grid*" OR "maturity framework*" OR "maturity level*") AND (ME* OR microenterprise* OR "small compan*" OR micro-business* OR "SME*" OR "Small and medium-sized enterprise*" OR "Small and medium-sized compan*" OR "Small and medium-sized firm*" OR "Small and medium-sized organizatio*" OR "Small enterprise*" OR "Small business*" OR "Small firm*" OR "Small organizatio*" OR "Large business*" OR "Large firm*" OR "Large organizatio*" OR "business*" OR "firm*" OR "organizatio*" OR "Small and medium-sized organisatio*" OR "Small organisatio*" OR "large organisatio*" OR "organisatio*" OR "Small and medium-sized enterprise*" OR "small enterprise*" OR "large enterprise*" OR "enterprise*")) OR ((" maturity model*"OR "maturity matrix*" OR "maturity grid*" OR "maturity framework*" OR "maturity level*") AND ("stage framework*" OR "stage model*" OR "stage matrix*" OR "stage grid*" OR "growth model" OR "stages of growth" OR "Organic growth" OR "Acquisition growth" OR "growth-oriented" OR "stability-oriented" OR "high growth firm*" OR "Slow-growth firm*" OR "high performing" OR "slow performing" OR "growth venture*" OR "no growth venture*" OR "states of growth" OR "stages-of-growth" OR "Growth priori*" OR "Growth potential" OR "Growth management" OR "Growth capabilities")) AND ("growth*" OR "Management") AND ("simulation" OR "evaluation" OR "model*" OR "analy*" OR "assesment*")) AND (LIMIT-TO (SRCTYPE,"j")) AND (LIMIT-TO (PUBSTAGE,"final")) AND (LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (LANGUAGE,"English"))

Figure 13: Final search list, Scopus variant

By conducting the final search with the final search list, 612 articles were identified in Scopus and 796 articles were identified in Web of Science. After removing duplicate articles, 1122 articles remained. These articles were then narrowed to most relevant articles by conducting inclusion-exclusion analyze in subchapter 3.3.

4.3 Inclusion exclusion analyze process (Step 4A)

Next, inclusion-exclusion analyze process was designed to narrow the article pool to the scope of the thesis so that the most valuable articles would be left to the article pool. As in previous systematic research steps, the process was designed by synthesizing practices from analyzed systematic review processes (figure 14).

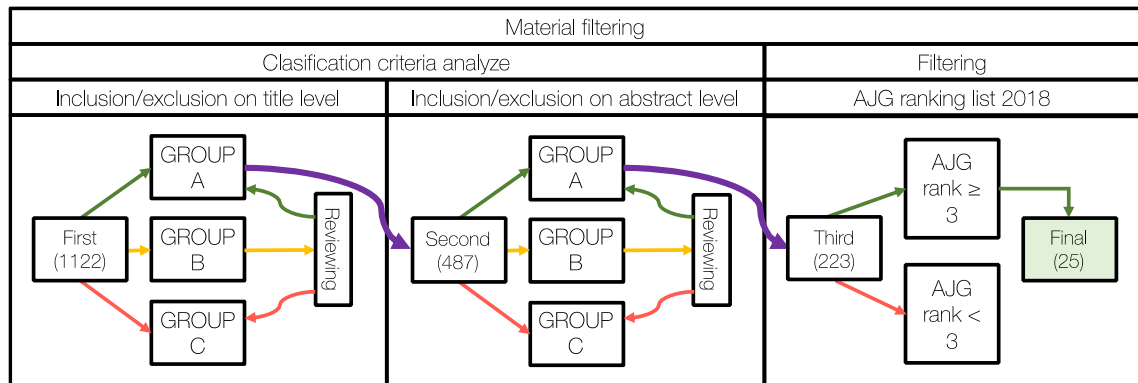| Material filtering		
Clasification criteria analyze		Filtering
Inclusion/exclusion on title level	Inclusion/exclusion on abstract level	AJG ranking list 2018

Figure 14: Designed inclusion exclusion process diagram for the thesis

As the diagram suggests, the articles were classified first on the title level and then on the abstract level. Finally, the remaining articles were filtered to get the final group of the articles. Each of these processes are described in detail below.

Different inclusion and exclusion criteria can be used in SLR depending on the focus and aim of the review. Classification criteria introduced by Thrope et al. (2005) was chosen as a primary inclusion and exclusion method for the thesis. Classification criteria classify articles into three groups: "A - Relevant studies", "B - Studies which relevance is unclear" and "C - Non-relevant studies" (table 8). Thrope et al. (2005)

Table 8: Classification criteria groups (Thrope et al., 2005)

Group name	Step description
A	Relevant studies
B	Studies which relevance is unclear
C	Non-relevant studies

When articles are grouped to groups A, B and C, articles in group B are reviewed again and assigned either to group A or C. Finally, articles left to group A are taken forward in the literature review. Articles in group C are discarded. (Thrope et al., 2005)

Groping to groups A, B, and C, should be defined clearly so that the clarity and the focus of the classification remain coherent (Tranfield et al., 2003; Thrope et al., 2005). To do this, grouping criteria were defined systematically on title and abstract level. Criteria were formed in the format "[article] is excluded if [requirement] is true". If the criteria were not fulfilled, the article was grouped to group C. If they were fulfilled, the article was grouped to group A. If the fulfilment of criteria was unsure, the article was grouped to group B. Focus in the formatting was set on exclusion instead of inclusion because there was a risk that inclusion criteria could change during the process. This led to the creation of title and abstract level grouping criteria (figure 15).

TITLE LEVEL CRITERIA: Article is excluded if the title doesn´t include maturity related and growth or implementation or industry related terminology.

ABSTRACT LEVEL CRITERIA: Article is excluded if the abstract doesn´t include maturity and growth and implementation and industry related terminology.

Figure 15: Title and abstract level grouping criteria

Fulfilment of the grouping criteria were reviewed subjectively by the author and the supervisors. Even so, the grouping criteria were designed so that the exclusion process would stay as coherent as possible throughout the group classification despite its subjective nature.

When classification was completed, the article pool was filtered once more by using threshold criteria. This was done to filter the article pool to size where the articles could be read and compared in the scope of the master thesis while still retaining most of the valuable articles. AJG 2018 journal quality guide was used again to set the threshold criteria. AJG ranking level 3 (table 9) was set as the threshold. According to this threshold, included articles had to be published in scientific journals which were well recognized according to AJG 2018 standards. In practice, this meant that if AJG 2018 ranking level of included article´s journal was equal or more than three, it was included in the final article pool.

Table 9: AJG - Academic Journal Quality Guide 2018, description of level 3 journal (Academic Journal Guide 2018, 2019)

Level #	Level description
3	3 rated journals publish original and well executed research papers and are highly regarded. These journals typically have good submission rates and are very selective in what they publish. Papers are heavily refereed. These highly regarded journals generally have good to excellent journal metrics relative to others in their field, although at present not all journals in this category carry a citation impact factor

These inclusion and exclusion processes were used to conduct the inclusion and exclusion analyze for the article pool. On the title level, 484 articles were grouped into group A, 23 articles were grouped into group B and 615 articles were grouped into group C. After reviewing articles in group B again, 3 articles were grouped into group A. This led in total 487 articles in group A which were taken forward to abstract level classification.

On the abstract level, 221 articles were grouped into group A, 26 articles were grouped into group B and 240 articles were grouped into group C. After reviewing articles in group B again, 2 articles were grouped into group A. This led in total 223 articles in group A. which were then taken forward to AJG 2018 filtering.

In AJG 2018 filtering, 24 articles had AJG 2018 level equal or more than three and 198 articles had AJG 2018 level less than three. This led to the article group of 24 articles which were then taken forward to the next step of the SLR.

4.4 Categorization and visualization (Step 5A)

4.4.1 Categorization

After inclusion exclusion analyse, full texts of the article group were read by the author. The articles were then summarized by the author and presented to the thesis supervisor. According to discussions with the supervisors, articles in the article group were then classified into two topic clusters based on content similarities by following Kraus et al. (2014) and Xi et al. (2013) approaches (figure 16). These topic clusters were cluster A:

Articles that present a new maturity model and cluster B: Articles that don´t present a new maturity model.

| CLUSTER A:
 Articles which present a new
 maturity model (17 articles) | CLUSTER B:
 Articles which don´t present a
 new maturity model (7 articles) |

Figure 16: Topic clusters for the article pool, modified from Kraus et al. (2014) and Xi et al. (2013)

These two topic clusters were constructed to focus on SLR analyzse. Articles in cluster B only partially fulfilled the research goal, as they didn´t present a new model – even thou the author and the supervisors had assumed so according to the title and abstract level review. Hence, they were grouped together to simplify the analyze process and to compare them with articles in cluster A. In total, cluster A included 17 articles and cluster B 7 articles.

4.4.2 Visualization

To simplify analyze step of SLR, comparison matrixes were formed for the clusters. This led to the creation of comparison matrix cluster A (appendix 1) and comparison matrix cluster B (appendix 2).

Columns for cluster A comparison matrix were set by following Cuenca et al. (2013) approach. According to it, all maturity models have common characteristics that can be used to compare them (table 10).

Table 10: Common characteristics of maturity models, modified from Cuenca et al. (2013)

Characteristic #	Characteristic
1	Maturity model
2	Key areas
3	Maturity levels

These characteristics: "maturity model", "Key areas" and "maturity levels" were defined as columns for Cluster A. After discussions with the supervisors, "name of the article" and "focus of the model" were defined as columns for Cluster A.

Columns for cluster B comparison matrix were set according to the authors´ own judgment, as the author didn´t find any existing approach for it. After discussions with the supervisors, "name of the article", "summary of findings" and "model levels" were defined as columns for cluster B. These columns were used to summarize what was done in the articles and to understand their relevance for the analyze.

Finally, columns "ID" and "reference" were defined for cluster A and cluster B. This was done to simplify and rationalize the referring process.

Cluster A comparison matrix reveals that all of the new models were built to a specific field of business. These models usually contained multiple domains or key areas where

the level of maturity was investigated. Most of the models used the 5-level maturity approach but the definition of these levels was different between the models. In each model, bigger maturity level meant better maturity in the maturity area.

Cluster B comparison matrix reveals that instead of creating a new maturity model, some of the articles created maturity tools for existing maturity models like CMMI or a model that was not really a maturity model. Other articles just proved that the maturity of a specific area could be measured or described the processes to build new maturity models. Especially the articles describing process to build new maturity models were seen usefully as they provided steps to implement new maturity models in new environments.

With this, the SLR methodology was finished. It led to the identification of an article group of 24 articles, which were then categorized and visualized in two clusters. In the following chapter, the articles are analyzed and reviewed.

5 ANALYZE OF THE ARTICLE GROUP

This chapter introduces step by step how the article group defined in SLR was analyzed. First, findings from articles were divided into themes and the themes were analyzed in detail one by one. Second, conclusions were made from the analysis to form a foundation for ME maturity model development together with the findings from overview of maturity models & ME growth management.

5.1 Thematic analyse (Step 1B)

Analyze of findings from the article group was conducted by using thematic analysis. In thematic analysis, topics of the articles are divided into themes and possible subthemes and the themes are analyzed one by one. Thematic analysis is visualized usually with some kind of framework (Bettinelli et al., 2017)

According to discussions between the author and the supervisors, the themes for thematic analysis were constructed subjectively. The themes were constructed to group the findings so that the findings could be easily reviewed according to set research questions. In total, four themes were created. For each theme, subthemes were created to handle findings better inside the themes (figure 17).

Theme 1		
HOW THE RESEARCH BEHIND THE MODEL IS CONDUCTED?		
Research method	Approach to maturity research	Approach to growth

Theme 2	
HOW THE MODEL IS CREATED?	
Maturity model structure	Maturity model roadmap

Theme 3		
HOW THE MODEL IS USED?		
Model validation	Model validation analyze	Model assesement

Figure 17: Thematic analysis themes and subthemes

The following subparts go through each of these themes one by one. Articles from the article pool are referenced by using IDs set to them, which can be seen from comparison matrix cluster A and cluster B (appendix 1 & appendix 2).

5.1.1 Theme 1: How the research behind the model is conducted?

Research method

Usually, research methods and research questions were stated first before conducting a literature review (IDs: 24 & 2). However, some of the articles began by conducting overview of the maturity literature to identify research questions and research hypotheses (IDs: 18 & 19). Some of the literature reviews were done systematically (ID: 2) but most of the literature reviews were conducted in a traditional way. The goal of conducting a literature review was either to gather understanding from maturity models (IDs: 4 & 18), problems in the research area (ID: 19) or other relevant topics and terminology (IDs: 23 & 24).

Some of the articles put emphasis on describing research methods in more detail. For example, Machado et al. (ID: 16) followed standard research quality principles stated by Yin (2013) to set goals for their research (table 11)

Table 11: Yin´s research quality principles, modified from (ID: 16)

Quality #	Quality name	Explanation
1	Internal validity	Maturity model levels are connected logically to maturity forming an evolutionary path to maturity
2	Construct validity	Research is conducted constructively. For example, data sources are managed logically, research protocol is followed, and case-interviews are planned
3	External validity	Maturity model and maturity model assessment are approved by external sources
4	Reliability	Research and its results can be trusted

Most of the articles used widely approved methods to process findings from literature reviews. These included methods like AS/E (ID: 12), bottom-up approach (ID: 4), Delphi Method (ID: 9), cluster analyze (ID: 15), multi-logic analyzer (ID: 15), design science approach (ID: 4) and visual representation (ID: 2).

Especially, the Delphi Method was used in many articles. For example, Reyes & Giachetti (ID: 9) used the Delphi Method as a research method to construct the supply chain maturity model. As they described, the objective of the Delphi Method is to achieve the most reliable consensus in a group of experts in three steps (Table 12)

Table 12: Reyes & Giachetti three-step Delphi Method approach, modified from (ID: 9)

Step #	Step description
1	- Gather the opinion of a group of experts, generally using a survey
2	- Synthesize and statistically summarize these opinions
3	- Provide feedback to the participants seeking a revision in their judgments, if any

Approach to maturity research

Some of the articles went in more detail describing the theory behind conducting maturity research. Three of the most significant descriptions identified by the author are described below.

First, Vereecke et al. (ID: 13) discussed maturity models primary roles in the company environment. They identified three primary roles of maturity models by using steps described by Torres (2014) (table 13).

Table 13: Three primary roles of maturity models, modified from (ID: 13)

Role #	Role description
1	- The model is designed to describe situation in its current state as it is
2	- The model provides guidelines to reach a higher level of maturity
3	- The model allows company to reflect the gap between the current, the desired and the best-in-class state of the measured process

Next, Bitici et al. (ID: 18) discussed maturity models roles in organizational learning. They identified three ways in which the maturity model facilitates organizational learning (table 14).

Table 14: Bitici et al. perspective to maturity models role in facilitating organizational learning, modified from (ID: 18)

Way #	Description
1	Focus on correction of mistakes in the company
2	Helps to solve current problems in the company
3	Facilitates open discussion along predefined and structured path - Reflection on current practices and introducing new ideas - Communication and dissemination of gaps and needs for change - Awareness of and learning from practices of other companies

Finally, Ahmed & Capretz (ID: 10) described a set of limitations of maturity models that should be taken into account when the maturity model is applied in the company environment (table 15).

Table 15: Ahmed´s & Capretz´s approach to limitations of maturity models, modified from (ID: 10)

Limitation #	Limitation description
1	- Degree of completeness of the model
2	- Issue of subjective assessment
3	- Bias in decision-making and response evaluation

4	- Degree of responder participation
5	- Shortcuts of assessment methodology
6	- Lack of improvement guidelines

Maturity models were used in articles mainly because of two reasons: 1) maturity models improve business management (IDs: 2, 24 & 25) and 2) maturity models can be used to benchmark which provides knowledge about the efficiency of maturity model versus other managerial approached (IDs: 11, 12 & 18).

Usually, articles that reviewed existing maturity models led to a comparison of reviewed maturity models. Comparison was often done either by listing the models (ID: 13) or through matrix comparison (IDs: 23 & 2). Comparison was then used to make deductions which led later to a creation of new maturity models (IDs: 2, 23, 13 & 25). Parties outside of the research group were sometimes involved in these comparisons and met in workshops (ID: 12) or inquired through survey research (ID: 15).

Approach to growth
Some of the articles took growth into account in their literature reviews (IDs: 10,11, 22 & 23). Maier et al. (ID: 23) identified that maturity and growth are terminologically close to each other. According to Gottschalk (ID: 22), all growth models have benchmark variables and dominant problems which can also be found from maturity models.

Many of the articles identified growth as one of the main goals of the maturity model assessment (IDs: 10, 11 & 17). In most cases, growth was seen as a strategic (ID: 19) or financial indicator (ID: 21). The effects of these growth indicators were either calculated mathematically (ID: 19) or discussed based on the literature findings (ID: 10).

Some of the articles also identified aspects that had a direct or indirect effect on growth (ID: 19). Bitici et al. (ID: 18) identified that the use of maturity models in practical self-assessments leads to growth in management practices. Valdés (ID: 11) identified that different characteristics have an effect to growth in different parts of maturity model assessment. Finally, Cuenca et al. (ID: 3) emphasized that maturity models should be flexible to enable growth. This could be achieved by designing maturity models so that they provide expansion to new key areas or integration opportunities to other models.

5.1.2 Theme 2: How the model is created?

Maturity model structure
Most of the articles build a one-dimensional linear maturity model. There were also a few models that build a two-dimensional maturity matrix and one article that build a three-dimensional maturity matrix (figure 17).

One-dimensional linear model

Articles:
1, 3, 4, 7, 10, 11, 13, 15, 16, 21, 22, 23 & 25

Two-dimensional matrix model

Articles:
2 &14
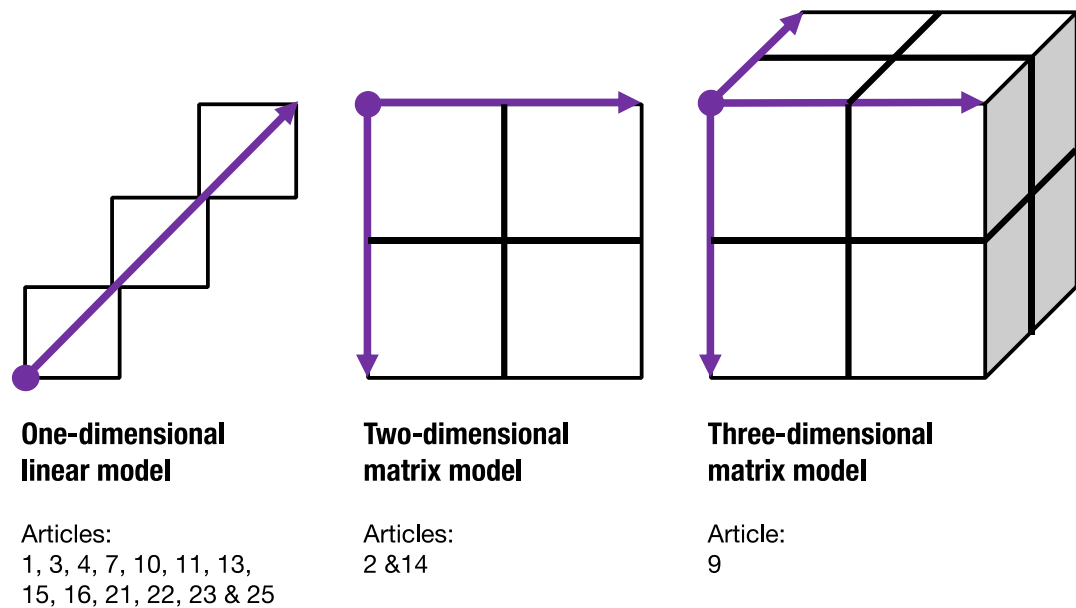
Three-dimensional matrix model

Article:
9

Figure 17: Types of the models in the article pool

All articles in Cluster 1 had key areas in their maturity models. Some of the articles divided these key areas further to focus on areas or dimensions (IDs: 4 & 11). Some of the articles described in detail methods to build and visualize maturity model structures. Five of the most significant descriptions identified by the author are described below.

First, Machado et al. (ID: 16) discussed criteria for the model building proposed by Franck (2013). The criteria present factors that should be taken into account when the structure of the model is defined (table 16).

Table 16: Model building quality criteria, modified from (ID: 16)

Criteria #	Explanation
1	Model offers simplified representation of the reality
2	Model clarifies what is considered essential in the reality
3	Model is testable
4	Model is sustainable
5	Model is conceptual
6	Model allows calculations and measurements
7	Model explains reality
8	Model offers fictive explanation of the reality
9	Model is strategic
10	Model is isomorphic and homomorphic: it has same form as the system it is representing

Next, Malmbrandt & Ahlström (ID: 13) discussed different approaches to measure maturity and visualize it in the maturity model structure. They identified two different approaches (table 17).

Table 17: Malmbrandt´s & Ahlström´s approach to measure and visualize maturity in maturity model structure, modified from (ID: 13)

Approach #	Description
1	Use categories representing different maturity levels - Used usually in practitioner-oriented instruments - Gives better guidance in developed activities - Minus: as certain practices can be rather organisation specific; it is difficult to provide clear descriptions for intermediate levels that are applicable across organisations
2	A questionnaire with Likert-type scales, describes only the top-level maturity explicitly (the best practice), with the other levels implied by anchors such as "strongly disagree" or "agree" - Can be applied more easily across various organizations - Permits the use of parametric statistic methods for analysis

Next, Boughzala & De Vreede (ID: 12) defined the maturity model structure from a design science perspective. Their goal was to build a collaboration maturity model (Col-MM) and to build it, they identified how maturity models should be structured. According to their analysis, maturity models are formed from structure, questionnaire, method and tool sub-parts. They used this approach to visualize how Col-MM was constructed (figure 18).

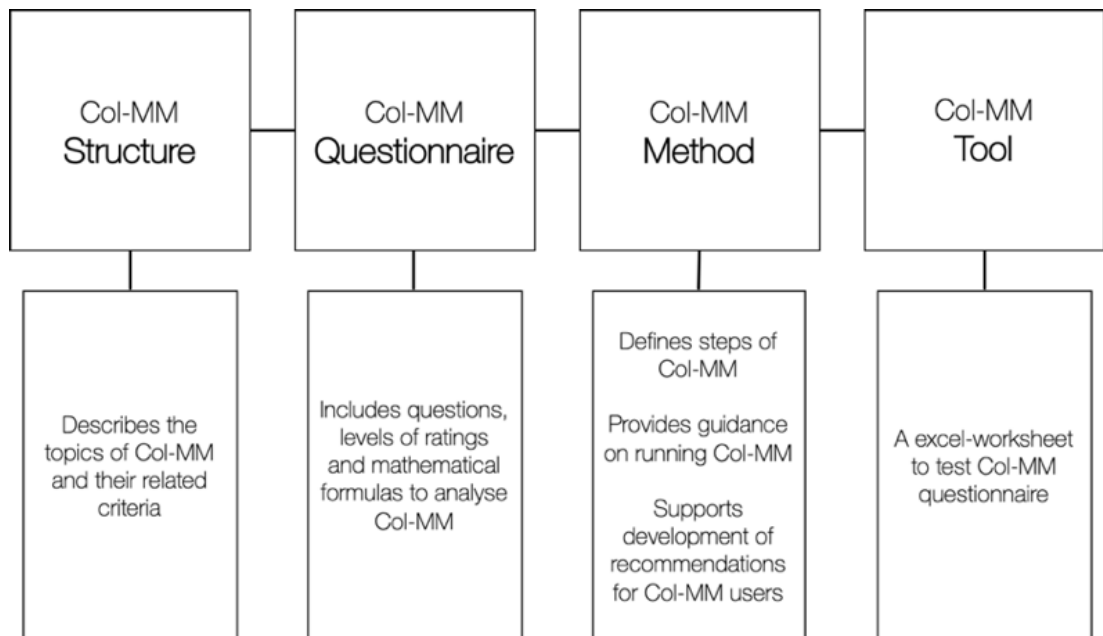Figure 18: Boughzala´s & De Vreede´s Col-MM structure, modified from (ID: 12)

Next, Machado et al. (ID: 16) defined an approach to set process areas´ practices and goals logically into the maturity model structure. They divided these process areas into specific and generic goals and practices according to CMMI principles (figure 19). Generic goals and practices are part of all process areas (performance goals,

communicating practices, etc.) whereas specific goals and practices are only part of specific process areas (sustainable management goals, back-end development practices, etc.).
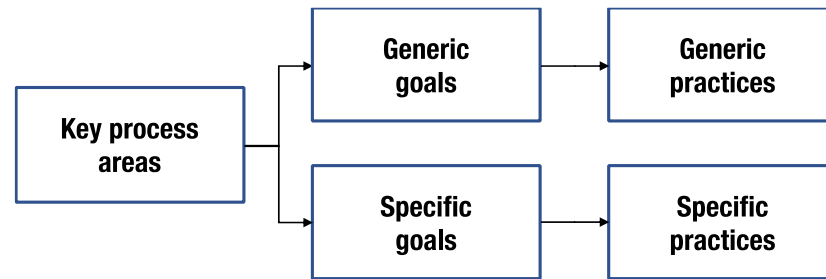

Figure 19: Machado et al. approach to divination of maturity model key processes areas, modified from (ID: 16)

Finally, Plomp M. & Batenburg (ID: 2) pointed out an interesting approach to maturity levels. According to their research, in some cases, the optimal maturity level is not necessarily the highest maturity level in the maturity model. For example, when companies' digital capabilities are measured, some companies may benefit more from the lower level. In these cases, maturity models could be viewed as typologies: they describe phases where the company can subsist, but don´t indicate whether one phase is better than another.

Maturity model roadmap

Most of the articles presented the creation process behind their maturity model. The step-by-step creation process was often used to describe this process (IDs: 13, 18, 23, 3 & 23). These step-by-step processes mostly included roadmaps (ID: 11), timelines (ID: 18) and prototyping loops (ID: 4). They were often applied from the existing maturity model literature (ID: 23).

Six articles presented a detailed step-by-step creation process. These step-by-step creation processes are described in more detail below.

Cuenca et al. (ID: 3) presented a five-step maturity model roadmap. They divide the maturity model creation process into five parts: scope, design, populate, deploy and maintain (table 18).

Table 18 Cuenca et al. maturity model roadmap, modified from (ID: 3)

Step #	Step name	Questions to answer
1	Scope	- In which domains the maturity model should be targeted and applied?
2	Design	- Why we want to apply the model to the problem? - How the model can be applied to the problem? - What can be achieved by using the model?
3	Populate	- What to measure in the maturity assessment and how to measure it. (Mutually exclusive and collectively exhaustive)?
4	Deploy	- How the model is applied initially in organizations? - How to define the primary collaborators?

5	Maintain	- How to promote the adaptability of the model? - How to guarantee reporting and information exchange? - How to guarantee flexibility for growth by incorporating key new areas or integration into another maturity model? - How to facilitate export and import of the maturity model (both for structure and implementation)?

Maier et al. (ID: 23) presented a four-step maturity model roadmap. They divided the maturity model creation process into four parts: planning, development, evaluation, and maintenance (table 19).

Table 19: Maier et al. maturity model roadmap, modified from (ID: 23)

Step #	Phase name	Questions to answer
1	Planning	- What is the audience of the model? - What is the aim of the model? - What is the scope of the model? - How to know whether the development and application of the model was successful?
2	Development	- Which process areas (domains) are selected? - Which maturity levels (levels) are selected? - How maturity cell texts are defined? - How administrative mechanisms are defined?
3	Evaluation	- How the model is validated? - How success of the model is verified?
4	Maintenance	- How the model is benchmarked? - How the results are maintained in databases? - How development process and results are communicated and developed?

Reyes et al. (ID: 9) presented a three-step maturity model roadmap. They divided the maturity model creation process into three parts: Definition, Test, and Improvement (table 20).

Table 20: Reyes et al. maturity model roadmap through Delphi method, modified from (ID: 9)

Step #	Step name	Phase description
1	Definition	- Define topic areas for the maturity model - Define hierarchy for the maturity levels
2	Test	- Test topic areas for the maturity model - Test hierarchy for the maturity levels - Test tools, techniques and concepts to reach the next maturity level

3	Improvement	- Improve the model according to the test results

Plomp & Batenburg (ID: 2) presented a three-step maturity model roadmap. They divided the maturity model creation process into three parts: Dimensions, Range and levels and Matrix framework (table 21).

Table 21: Plomp`s & Batenburg`s maturity model roadmap, modified from (ID: 2)

Step #	Step name	Phase description
1	Dimensions	- Define two dimensions: organizational and technological separately to ensure that each domain-specific indicator is covered
2	Range and levels	- Define the range of the dimensions - Set minimum and maximum - Divide range into levels that are equally divided
3	Matrix framework	- Combine dimensions into a single matrix framework to form matrix maturity model

Bitici et al. (ID: 18) presented s five-step maturity model roadmap for maturity model content analysis and causal mapping. They divided the maturity model creation process into five parts: Organizing ideas, Pattern recognition, Causal mapping, Causal map testing and Causal map improvement (table 22).

Table 22: Bitici et al. content analysis and causal mapping approach, modified from (ID: 18)

Step #	Step name	Step description
1	Organizing ideas	- Ideas from research team were organized in a visual format on a wall
2	Pattern recognition	- Visual patterns are discussed, and potential patterns and meanings are identified with research team
3	Causal mapping	- Potential patterns and meanings are combined to form maturity model causal maps
4	Causal map testing	- Maturity model causal maps are tested and verified with company representatives and experts
5	Causal map improvement	- Maturity model causal maps are developed to maturity models according

		to test results

Finally, Myrodia et al. (ID: 24) presented a two-step maturity model roadmap. They divided the maturity model creation process into two parts: Dimension step and Level step (table 23).

Table 23 Myrodia et al. maturity model roadmap, modified from (ID: 24)

Step #	Step name	Step description
1	Dimension step	Define dimensions for maturity model - Cover the relevant disciplines in the company
2	Level step	Define level specific requirements for each dimension

5.1.3 Theme 3: How the model is used?

Model validation
Maturity models were tested either in in-house (IDs: 12, 13, 15, 18, 24 & 23) or business case test environment (IDs: 12, 18, 25, 3, 9, 2, 24, 18,1 & 3), or in both test environments. Some of the articles in Cluster B didn´t test the maturity model directly. Instead, they developed step by step process which could be used to test the model in the future (ID: 23).

Most of the articles tested maturity models in business case test environment These tests were conducted usually in multiple case companies (IDs: 18 & 24) with outside parties like stakeholders and end-users to get data and feedback (IDs: 12 & 24).

Some articles conducted surveys. The surveys were either conducted with individual topic experts or with case companies. In case companies, some articles conducted surveys for case company management whereas others conducted face to face interviews to other case company representatives (IDs: 25 & 19). The interviews were conducted either as individual interviews (IDs: 18 & 9) or group interviews in workshops or review meetings (IDs: 24 & 4). Some of the articles used electrical survey tools to conduct these surveys (ID: 18). Survey questions were often divided according to maturity models´ key areas (IDs: 14, 17 & 20). In some instances, the questions were divided according to maturity levels (ID: 3).

Cuenca et al. (ID: 3) presented a four-step maturity model testing process. They divided the testing process into four steps: Team formation, Testing process, Result analyze and Improvement plan (Table 24).

Table 24: Cuenca et al. four-step maturity model testing process, modified from (ID: 3)

Step #	Step name	Step description
1	Team formation	- Establish teams responsible of maturity model implementation and assign key areas to each team
2	Testing process	- Implement maturity assessment

| 3 | Results analyse | - Analyse the results of maturity assessment
- Define improvement proposals |
| 4 | Improvement plan | - Applicate improvement proposals to maturity model assessment |

Model validation analyze

Results from business case tests were analyzed either on case by case basis or through cross-case analyze (ID: 18). Some articles used mathematical methods to analyze these results. They identified maturity model threshold values from survey, literature or interview data and compared them with the data from other sources analyze relevancy and efficiency of the maturity model method (IDs: 15, 13, 9 & 18).

Likert scale was often used in the surveys to compare survey results together. Some articles used these results to calculate thresholds for their maturity models´ dimensions (IDs: 17, 20 & 7). Survey results were often visualized either by using bar or radar graphs (figure 20).

Radar graph representation
(Articles: 3, 9, 13)

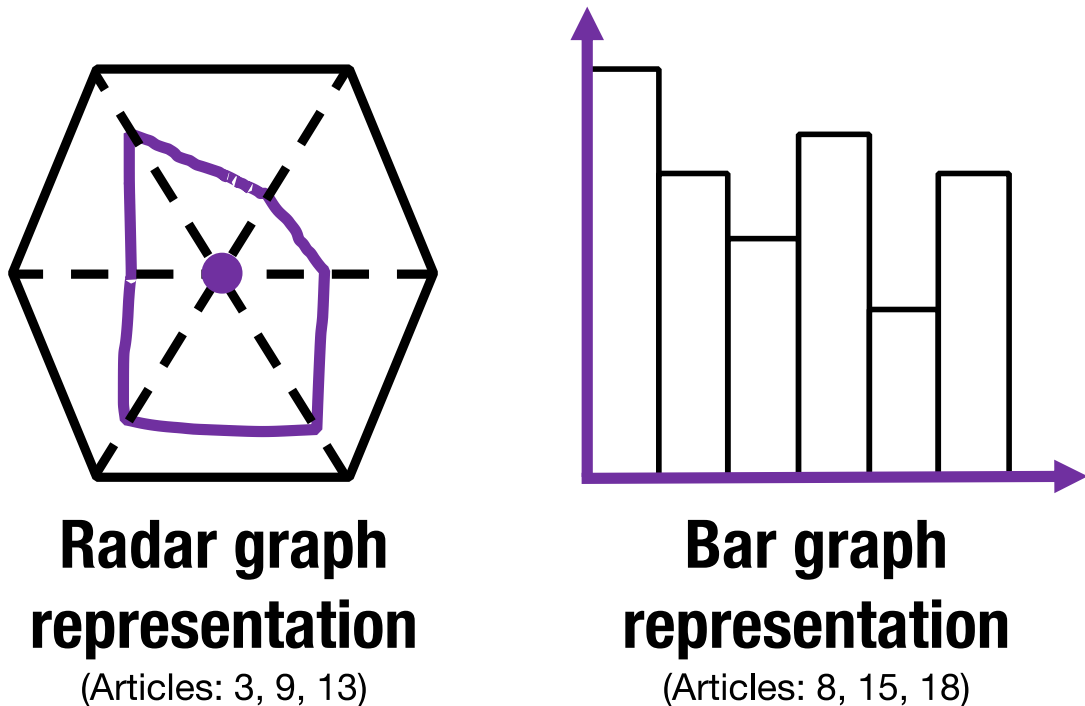**Bar graph representation**
(Articles: 8, 15, 18)

Figure 20: Summary of survey data visualization in the article group

Vereecke et al. (ID: 13) identified three ways to evaluate maturity models and compare them with other maturity models. These ways are: Construct validity test, Content validity test and External validity test (table 25).

Table 25: Vereecke et al. three ways to evaluate maturity models, modified from (ID: 13)

Way #	Way name	Description
1	Construct validity test	- Compare test results with previous results done with other maturity models
2	Content validity test	- Review the model with academics and

		practitioners
3	External validity test	- Review that the users see the model usable and reflective for their own use

Cheng & Fong (ID: 23) presented a six-step maturity data collection and analysis process. These steps cover data collection from the beginning of model creation to the end of the model analyze (table 26).

Table 26: Cheng´s & Fong´s six-step maturity data collection and analysis process, modified from (ID: 23)

Step #	Step description
1	- Experts are used to validate the maturity
2	- Maturity model tool is created by researchers
3	- Expert reports are finalized
4	- Researchers interview companies again
5	- Management team in companies conduct self-assessments using the maturity models
6	- Research team analyses the results

Model assessment
Reyes & Giachetti (ID: 9) presented a five-step maturity model assessment process. They divided assessment process to five steps (table 27).

Table 27: Reyes´ & Giachetti´s maturity model assessment process, modified from (ID: 9)

Step #	Step description
1	- Process assessment
2	- Assessment questionnaire - Question answered with "yes" or "no". If answer is yes, company has to document the evidence which support the answer. If answer is no, that area is identified as an improvement opportunity
3	- Assessment questionnaire result analyze through radar graph
4	- General classification of the results - Company receives a maturity classification of the last level completed. Improvement roadmap is conducted according to this level
5	- Determining an improvement roadmap process by using

	assessment sheet

5.2 Conclusion

5.2.1 Conclusions from theme 1

Yin´s (2013) research quality principles should be taken into account when the success of maturity levels, maturity structure, and maturity assessment are reviewed. First, the maturity model should have internal validity: maturity model levels should be connected logically to maturity forming an evolutionary path to maturity. Next, the maturity model should have construct validity: the research should be conducted constructively. Next, the maturity model should have external validity: maturity model and maturity model assessment should be approved by external sources. Finally, the maturity model should be reliable: research and research results should be trusted.

From the presented approach, the Delphi method was used most. However, the Delphi Method is a good approach in cases where the model is created quantitatively. Our approach to the creation of the ME maturity model is a systematic, qualitative process where the model is synthesized from the analyzed literature. Hence, we will not use the Delphi Method to form our model. However, the Delphi Method could be used later to test the model and update it according to the feedback from the end-users and experts.

As Torres (2014) points out, fulfillment of primary roles of maturity models should be reviewed when the model is constructed. The model should describe MEs´ growth management as it is in its current state. It should include guidelines to help MEs reach a higher level of maturity. Finally, it should allow MEs to reflect the gap between the current, the desired and the best-in-class state of the ME growth management.

Bitici et al. (ID: 18) perspective to maturity models´ role in facilitating organizational learning should be taken into account when the success of maturity assessment tests is reviewed. According to them, maturity model assessment focus should be in focusing on correcting mistakes in MEs, solve problems in MEs and facilitate open discussion along the predefined and structured paths between micro-entrepreneurs to reflect practices, gaps, needs for change and introduce new ideas and needs for changes.

Ahmed´s & Capretz´s (ID: 10) approach to limitations of maturity models should be taken into account when the maturity model is developed and when maturity assessment is conducted in the company. When the ME maturity model is developed, completeness of the model and lack of improvement guidelines should be reviewed and minimized. When maturity assessment is conducted, the issue of subjective assessment, bias in decision making and response evaluation, degree of responder participation and shortcuts of assessment methodology should be reviewed and minimized.

As reviewed, maturity models are used for two reasons: 1) maturity models improve business management and 2) maturity models can be used to benchmark which provides knowledge about the efficiency of maturity model versus other managerial approached. Use cases of ME focused maturity model should be compared to these reasons. Finally, as Cuenca et al. (ID: 3) pointed out, maturity models should be flexible to enable growth. This should be achieved in the ME maturity model by designing the model so that it can be expanded to new key areas or integrated with other models.

5.2.2 Conclusions from theme 2

As maturity structure analyze revealed, most of the articles build a one-dimensional linear maturity model whereas only a few models build multi-dimensional maturity matrix models. However, as discussed in conclusions from introduction to maturity models & ME growth management, the matrix-based model could fit our needs better than a one-dimensional model due to the matrix model´s advantages. As the model is structured around key areas, choose of the representation for the ME business maturity model should be chosen when key areas for the model are defined.

Franck´s (2013) model building quality criteria should be taken into account when the ME business maturity model is constructed. For example, the model should focus on the most essential parts of MEs´ business management and explain the evolution of ME business management. Hence, fulfilment of Franck´s quality criteria is reviewed when the model is constructed.

Malmbrandt´s & Ahlström´s (ID: 13) approach to measure and visualize maturity in the maturity model structure should be taken into account when the maturity model structure is defined. As they state, the approach between the use of categories and the use of questionnaires to represent maturity levels should be considered when the model is constructed.

Boughzala´s & De Vreede´s (ID: 12) approach to the structure of the maturity model should be considered when the model is structured as it opens new perspectives about the model. Their approach helps to understand the complexity of the term "maturity model". According to their findings, when people talk about maturity models, they may be talking only about few subparts of the maturity models or maturity model as the whole as the term is used in many different contexts. This opens a question about the final scope of the thesis which should be addressed: If maturity model can be seen as a structured entity, which maturity model sub-parts should be included, and which exclude from our maturity model in the scope of the thesis? This question is critical, and it is answered later in summary and conclusions sub-chapter.

Machado et al. (ID: 16) approach to the divination of maturity model key processes areas should be taken into account when the maturity model structure is defined. Their way to divide key process areas to generic and specific goals and practices may help to rationalize the structure of the ME focused business maturity model.

Finally, the maturity model roadmaps presented in the article pool should be used to define the roadmap for ME business maturity model development. Best practices from six presented step-by-step creation processes (IDs: 2, 3, 9, 18, 23 & 24) should be taken into account when the roadmap is defined.

5.2.3 Conclusions from theme 3

As the thematic analyze revealed, maturity models are tested either in in-house or business case test environment or in both test environments. In our cases, as we are measuring the maturity of the MEs, there wouldn´t be a target for a in-house tests. Hence, ME business maturity model tests should be done in a business case test environment inside of case MEs.

If surveys are conducted in case companies, it seems that both group and individual surveys should be conducted. Group surveys should be targeted to all employees in MEs and individual surveys should be targeted to ME owner-managers as they play the central point in ME´s success. Survey structure and implementation method should be defined later when the maturity model structure and key areas are defined.

Cuenca et al. (ID: 3) Approach to the maturity model testing process should be considered when the model is tested. According to them, steps of team formation, testing process, results analyze, and improvement plan should be completed to test maturity models successfully. These steps should be considered when the ME maturity model is tested.

As the thematic analyze revealed, business case test results are analyzed either on case by case basis or through cross-case analyze. In our case, the use of both types of analyzing methods seems useful. Case by case analyze could highlight development opportunities inside case companies whereas cross-case analyze could help to benchmark ME core groups or different types of MEs. As Plomp & Batenburg (ID: 2) pointed out, it may be possible that some types of MEs could benefit from different levels of maturity – which cross-case analyze could reveal. Hence, the ME business maturity model test result should be analyzed both through case by case and cross-case analysis.

Vereecke et al. (ID: 13) maturity model evaluation tests should be implemented when the maturity model is tested in the case company. As they point out, construct, content and external validity tests help to develop and validated the success of the maturity model. The use of these evaluation tests should be discussed when the ME business maturity model assessment is constructed.

Cheng´s & Fong´s (ID: 23) maturity data collection and analysis process should be applied when the analyzing method for the ME maturity model is defined as it provides a logical path for the analysis. Finally, Reyes´ & Giachetti´s (ID: 9) approach to maturity model assessment process should be applied when ME maturity model assessment is conducted. As they point out, the assessment process contains many areas, for example, process assessment, assessment questionnaire, and improvement roadmap. These areas should be taken into account when the ME maturity model assessment is designed.

6 CONSTRUCTION OF MICRO-ENTERPRISE FOCUSED MATURITY MODEL

According to the findings from the business maturity and growth management overview and the SLR, the author divided construction of the ME focused maturity model into three parts: "Part A: Defining the scope and the roadmap", "Part B: Defining roadmap is followed step by step", and "PART C: Conclusion" (table 26). These parts are gone through one by one in the following subchapters.

Table 26. Construction of the ME focused growth maturity model in three parts

SUB CHAPTER 6.1: DEFINING THE SCOPE AND THE ROADMAP	
Step #	Step description
1A	Scope of the model is defined
2A	Maturity model roadmap is defined

SUB CHAPTER 6.2: DEFINED ROADMAP IS FOLLOWED STEP BY STEP	
Step #	Step #
1B	Maturity model roadmap step "Structure design" is conducted
2B	Maturity model roadmap step "Structure development" is conducted

PART C: CONCLUSION

6.1 Defining the scope and the roadmap

In the steps 1A and 2B, the scope of the thesis and the maturity model roadmaps are defined.

6.1.1 Scope of the model (Step 1A)

According to discussions between the author and the supervisors, it was decided to narrow the focus of the thesis by taking advantage of Boughzala´s & De Vreede´s (ID: 12) approach to maturity model structure (figure 21).
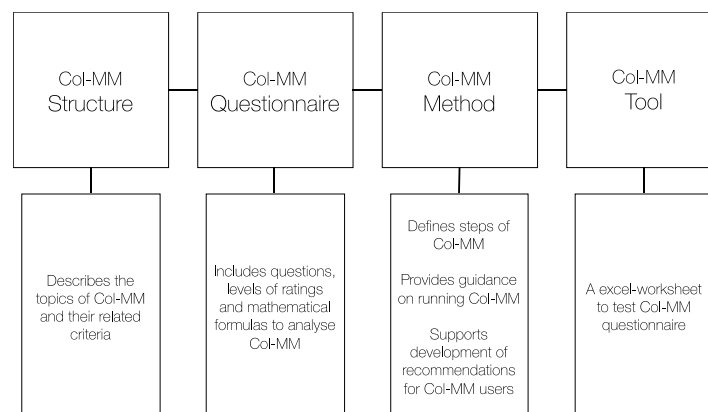

Figure 21: Boughzala´s & De Vreede´s Col-MM structure, modified from (ID: 12)

As the main goal of the thesis was to understand what kind of maturity model could help MEs in long term growth and business management, the author and the supervisors weren´t interested in testing the model in the scope of the thesis. Hence, the questionnaire, method, and tool subparts were removed from the scope of the thesis. Thus, the scope of the thesis was narrowed to creation of the ME maturity model structure.

According to Boughzala & De Vreede (ID: 12), maturity model structure describes the maturity model´s key areas, maturity levels, and their related criteria. According to the discussions between the author and the supervisors, this was understood as seen in the figure 22.
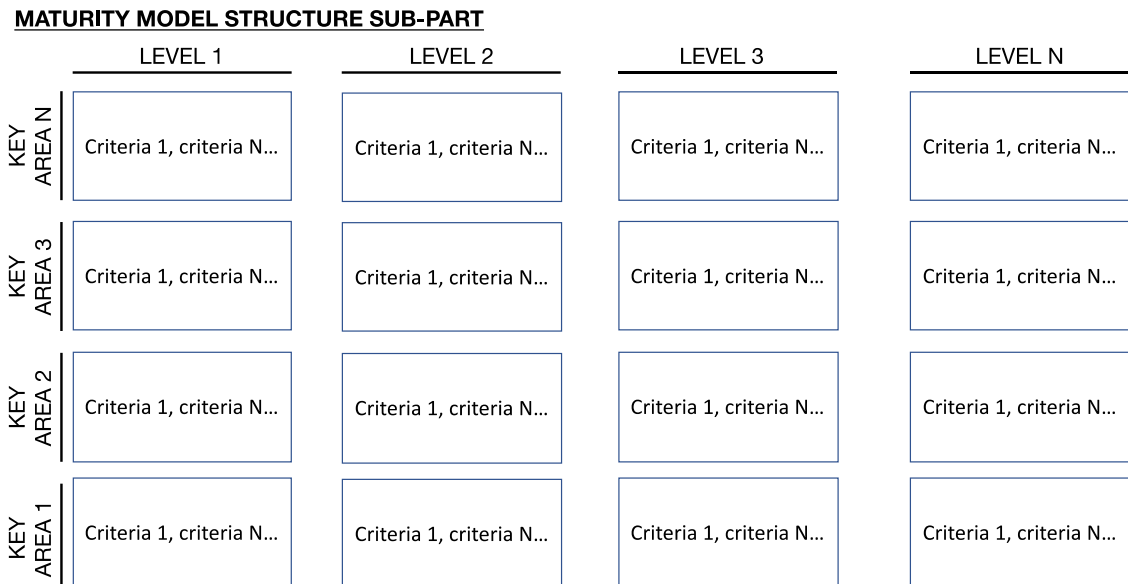
MATURITY MODEL STRUCTURE SUB-PART

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL N
KEY AREA N	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…
KEY AREA 3	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…
KEY AREA 2	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…
KEY AREA 1	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…	Criteria 1, criteria N…

Figure 22: Interpretation of Boughzala´s & De Vreede´s structure sub-part

6.1.2 Maturity model roadmap (Step 2A)

To be able to form the ME maturity model structure and the foundation for the further ME maturity model development, the ME maturity model roadmap was defined. This was done by reviewing six step-by-step maturity model roadmap processes presented in chapter five and by defining the ME maturity model roadmap according to these findings.

The step-by-step maturity model roadmaps were first combined to a table, where steps of different roadmaps were compared in parallel together. This led to the creation of a maturity model roadmap comparison table (table 28).

Then, the author defined a roadmap for the ME maturity model by synthesising parallel steps from the maturity model roadmap comparison table together to logical steps. This Led to creation of the ME maturity model that included four steps: "Model structure design", "Model structure development", "Model deployment & evaluation" and "Model maintenance" from which "Model structure design" and "Model structure development" were part of the scope of the thesis – the ME maturity model structure. The steps of the ME maturity model in comparison to other roadmaps presented in the maturity model roadmap comparison table are visualized in table 29.

Table 28: Maturity model roadmap comparison table

Roadmaps						
(ID: 2, Plomp et al.,2010)	(ID: 3, Cuenze et al., 2013)	(ID: 9, Garcia, Giachetti, 2010)	(ID: 13, Vereecke et al., 2018)	(ID: 18, Bitici et al., 2015)	(ID: 23, Maier et al., 2011)	(ID: 24, Myrodia et al., 2019)
	Scope			Phase 1	Planning	
	Design					
Phase 1	Populate	Phase 1		Phase 2	Development	Phase 1
Phase 2				Phase 3		Phase 2
Phase 3						
	Deploy	Phase 2	Phase 1	Phase 4	Evaluation	
			Phase 2			
			Phase 3			
	Maintain					
		Phase 3		Phase 5	Maintenance	

Table 29: The steps for the ME maturity model in comparison to other roadmaps (Blue rectangle includes the steps in the scope of the thesis)

Roadmaps

(ID: 2, Plomp et al.,2010)	(ID: 3, Cuenze et al., 2013)	(ID: 9, Garcia, Giachetti, 2010)	(ID: 13, Vereecke et al., 2018)	(ID: 18, Bitici et al., 2015)	(ID: 23, Maier et al., 2011)	(ID: 24, Myrodia et al., 2019)	ME maturity model roadmap steps
	Scope			Phase 1	Planning		Structure design
	Design						
Phase 1	Populate	Phase 1		Phase 2	Development	Phase 1	Structure development
Phase 2				Phase 3		Phase 2	
Phase 3							
	Deploy	Phase 2	Phase 1	Phase 4	Evaluation		Structure tool deployment & evaluation
			Phase 2				
	Maintain		Phase 3				
		Phase 3		Phase 5	Maintenance		Structure tool maintenance

Each of the six step-by-step maturity model roadmaps had questions for each of their steps which had to be answered before proceeding to the next step. These questions were first combined to the parallel ME maturity model steps and then reviewed by the author and the supervisors. During the review, duplicate steps were removed, and the questions were streamlined and combined.

After the discussions with the supervisors, the author decided to unify the terminology presented in the maturity model roadmaps. This was done because the articles in the SLR article pool and the business maturity and growth management chapter talked about similar topics with different terms which could generate confusion in the maturity model. First, similar topic with different terms were combined hierarchically. Then, the author chose one term on each hierarchical level to be used in the roadmap (figure 25). This led to creation of the ME maturity model roadmap (table 30).
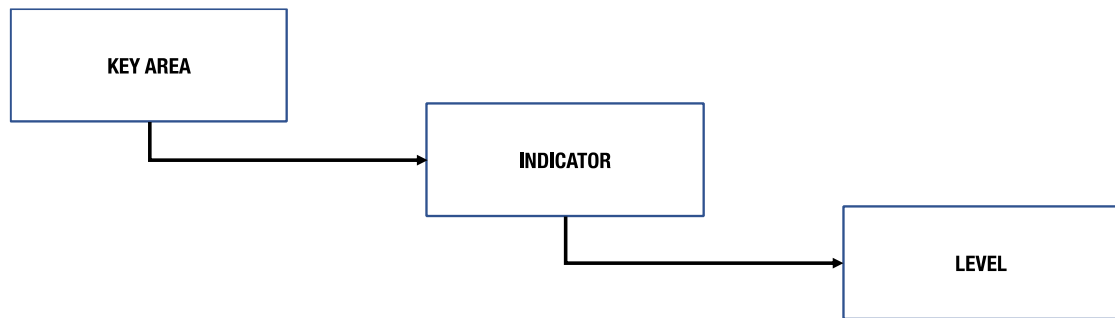
Figure 25: Hierarchical structure of the terms in the ME maturity model roadmap

Table 30: The ME maturity model roadmap

Step	Questions to answer

Model structure design	- What is the aim of the model?
	  o Why the model is applied to the problem?
	  o What can be achieved by using the model?
	
	- How ideas are combined to form the model?
	- Where the model can be applied?
	- How the model can be applied to the identified problem?
	
	- What is the audience of the model?
	- How to know whether the development and application of the model were successful?

Model structure development	- What to measure in the model?
	- What are the key parts of the model?
	  o What are the key areas in the model?
	  o What are the indicators for the key areas?
	  o What are the levels for the indicators?
	
	- What are the dimensions in the model?
	  o How dimensions are divided between minimum and maximum?

Model deployment & evaluation	**[Outside of the focus of the thesis]**
	- How the model implementation responsibilities are divided?
	- How the model is validated?
	- How the success of the model is verified?
	- How the model is applied in companies?
	
	- How the model is tested in the companies?
	  o How topic areas are tested
	  o How hierarchy of the maturity levels is tested
	  o How tools, techniques and concepts are tested
	
	- How the primary collaborators are defined?
	- How construct, content and external validity of the model are evaluated?

Model maintenance	**[Outside of the focus of the thesis]** - How to promote the adaptability of the model? - How to guarantee reporting and information exchange? - How to guarantee flexibility and the growth of the model? - How to improve the model according to the test results - How the model is benchmarked? - How the results from the model assessment are maintained in databases? - How the development process and the results are communicated?

6.2 Following the defined roadmap

In the steps 1B and 2B, questions presented in the ME maturity model roadmap were answered in the scope of the thesis one by one to form the ME maturity model structure.

6.2.1 Maturity model roadmap - Structure design (Step 1B)

What is the aim of the model?
The main goal of the thesis is to develop a maturity model for MEs which helps MEs to plan long-term growth and business management.

- **Why the model is applied to the problem?**
  MEs would benefit from a specific ME focused maturity model. However, there is yet no ME focused maturity model in the market.

- **What can be achieved by using the model?**
  As Torres (2014) pointed out, by using the model, the ME should be able to:
  o Get information about their current state
  o Follow guidelines to reach a higher level of maturity
  o Reflect gap between the current, the desired and the best-in-class state in ME growth management

How ideas are combined to form the model?
The author and the supervisors discussed and made conclusions from the business maturity and growth management overview and the SLR chapters to form the ME maturity model structure.

Where the model can be applied?
The model can be applied in the most relevant growth and business management related situations that MEs faces in their business environment.

How the model can be applied to the identified problem?
The model is applied to companies by using an assessment tool which MEs use to form the maturity questionnaire and to get guidelines for improvement procedures. According to SoloENTRE project plan, the assessment tool will be a webpage where the ME maturity questionnaire can be filled.

What is the audience of the model?
The audience is ME employees – especially owner-managers and public business advisory services which work with MEs.

How to know whether the development and application of the model were successful?
The development of the model is successful if it answers all the questions set in the roadmap and fulfills all the requirements identified in the business maturity and growth management overview and the STR.

6.2.2 Maturity model roadmap - Structure development (Step 2B)

What to measure in the model?

The model measures MEs abilities in long-term growth and business management. To form more detailed description, some questions from the business maturity and growth management overview and the SLR were first answered. These questions are:

1) **Should the model be owner centric, ME centric or combine both owner and ME centric criteria?**
   Maturity models are followed by fulfilling criteria in each stage. According to our findings, multiple sources emphasize owner-managers role in ME´s business management, some of which point out that owner-manager´s role is critical for ME´s success. This leads to three potential approaches to set criteria (figure 26):

a) Criteria are ME centric
b) Criteria are owner-manager centric
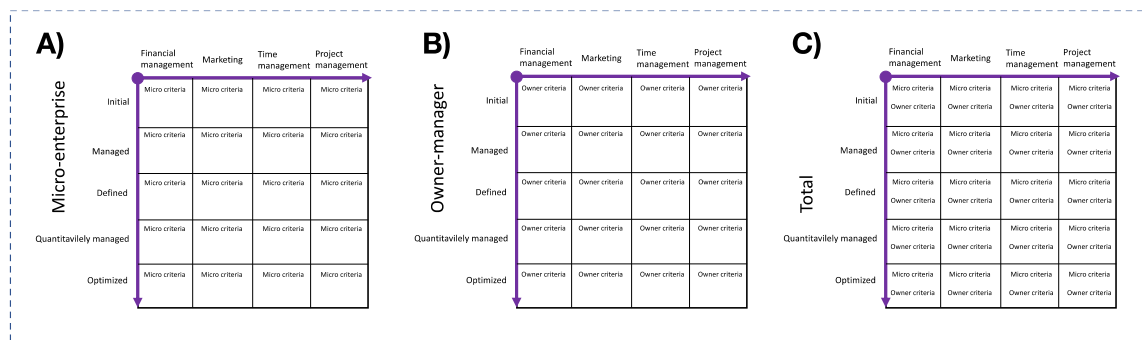c) Criteria are both ME and owner-manager centric

Figure 26: Examples of three potential approaches to set stage criteria

After some further analysis and discussion with the supervisors, approach c) was chosen. By choosing this approach, the risk that some important criteria identified in the thesis are left out is minimized. This approach also provides data both from the ME and the owner-manager perspective which may be useful when the model is developed further according to the case test results.

2) **If the model is a matrix model, what type of matrix model it should be?**
   As stated before, a matrix-based representation would probably work better than one-dimensional linear representation. Matrix-based representation could be done either by using a two-dimensional or three-dimensional matrix model (figure 27). According to the discussions with the supervisors, the author decided to use two-dimensional matrix-representation as its simpler to use and define to audience than three-dimensional matrix-representation.
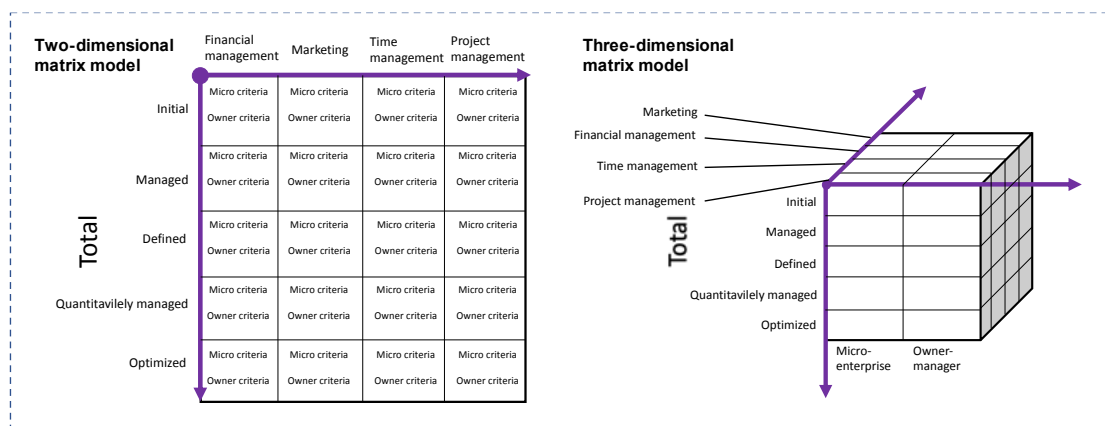

Figure 27: Examples of a two- and three-dimensional matrix models

2) What growth means in the model?
According to the findings from the article pool, growth in MEs is growth in size, growth in business management or combination of them (figure 28). According to this, it seems that a good ME focused maturity model should provide a structure that helps companies to grow either or both in size and business management capabilities if they want to. This approach goes well together with the thesis´ definition of business growth and approach to nature of the growth: business growth is an action, a process or a manner of growing within a company through complex interactions within the company and the evolving environment.
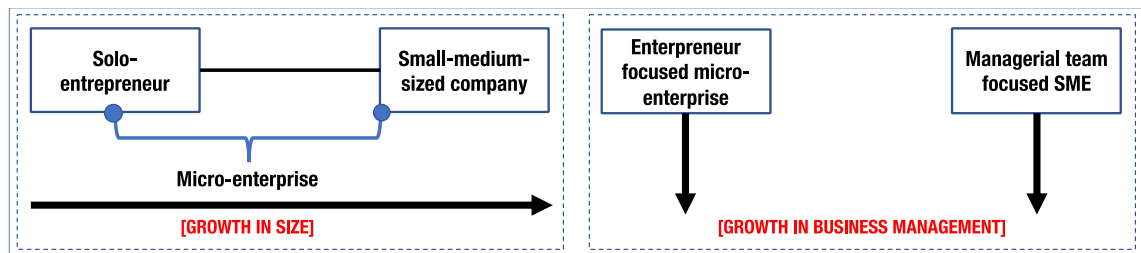

Figure 28: Visualization of different types of growth mentioned in the article pool

According to these findings, the author decided that the growth in the ME maturity model means either ME´s growth in the size or ME´s improvement in business management. This growth is achieved through the changes inside the company which have effects to interactions within the company and the evolving environment.

3) How internal and external factors should be taken into account
As discussed by Perren (1999), there are internal and external factors that have effects on ME´s growth, some of which can be seen in figure 29. The model will focus on internal factors in ME, but question arises should it also focus on external factors?
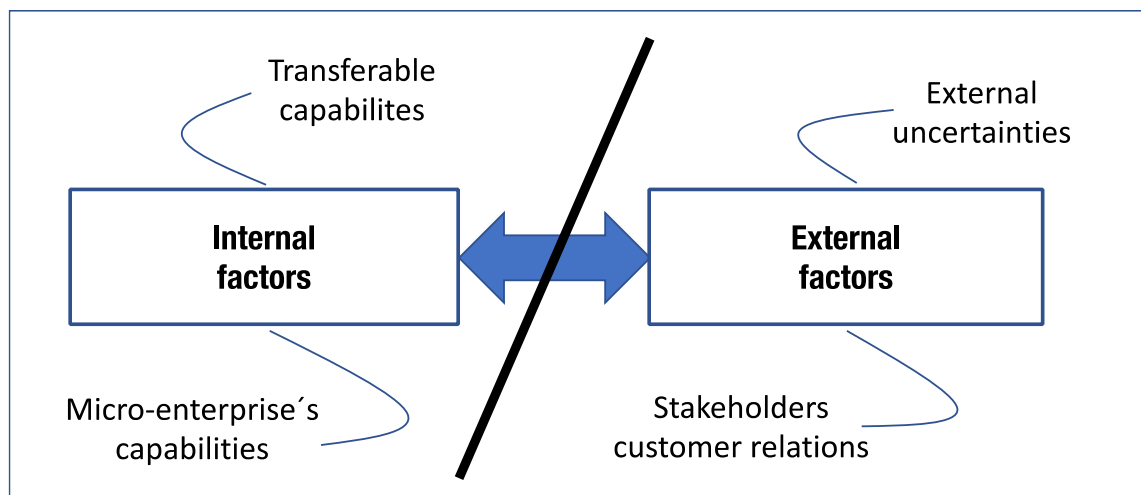

Figure 29: Some of the internal and external growth factors, modified from Perren (1999)

As Perren (1999) points out, there are three types of growth factors:

a) Factors which require self-awareness from owner-manager
b) Factors which owner-manager has more control
c) Factors which owner-manager has only little control

According to the discussions between the author and the supervisors, the decision was made to focus on the areas which criteria MEs or owner-managers can affect instead of making strong divination between internal and external factors.

According to these three decisions, the model measures:

ME´s operational ability to grow its size and business management capabilities. This ability is measured both in owner-manager and companywide levels in areas, which the ME or owner-manage can impact.

What are the key parts in the model?

- **What are the key areas in the model?**
  After discussions between the author and the supervisors, three key areas were defined for the ME business maturity model according to the findings from the business maturity and growth management overview and the SLR. These key areas are: "Human Resources", "Operations" and "Customer Relations".

  1) **Human Resource key area**
     Human resources key area includes owner-manager and employee-related indicators that affect the ME´s ability to grow.

  2) **Operations key area**
     Operations key area includes operational factor and activities related indicators that affect the ME´s ability to grow.

  3) **Customer Relations key area**
     Customer Relations key area includes customer-related indicators that affect the ME´s ability to grow.

  Digitalization is connected to all of these four key areas and can be seen as a cross-sectional theme through them. Digitalization is connected to MEs´ growth, performance, and competitiveness. However, MEs utilize digital tools less likely than larger firms. They lack a long-term focus on digital solutions. However, some companies don´t necessarily benefit from a higher level of digitalization. Hence, MEs should achieve balance in their digital activities which support growth in their fields and growth areas.

- **What are the indicators for the key areas?**
  As mentioned before, business growth can be measured with objective and subjective indicators like turnover, employment, performance, market share, and assets. According to the findings from the business maturity and growth management overview and the SLR, the author decided to use performance indicators in the ME maturity model. Performance indicators are subjective indicators so they can be modified to fit the ME viewpoint.

Performance indicators for the ME maturity model´s key areas were defined according to conclusions made from the business maturity and growth management overview and the SLR. Topics and details from the conclusions were combined and evaluated by the author under the defined key areas. The performance indicators weren´t compared with each other so they cannot be put in the order of the importance before the case test results. However, as mentioned many times in the literature, owner-manager-centric factors have a huge effect on MEs chance to grow so it could be assumed that owner-manager related indicators would be the most important performance indicators.

1) **Human Resource key area indicators**
   Human Resource key area includes owner-manager and employee capabilities indicator groups.

   Owner-manager indicators
   Owner-manager indicator group includes the indicators, which help the owner-manager to grow the ME. This includes indicators "Desire to Succeed" (modified from Perren (1999)), "Desire to Take Risks" (modified from Perren (1999)), "Desire to Grow" (modified from Perren (1999)), "Self-leading apabilities" (modified from Muhos et al. (2018)), and "Skillset" (modified from Hänninen et al. (2017)).

   Desire to succeed, take risks and grow describes owner-managers mindset towards grow. If the owner-manager has no desire, the growth of the ME is difficult as the owner-managers play a critical role in MEs. Also, if the desire, like the desire to take risks, is too strong, it may have negative effects on the business growth. Hence, owner-managers should have balanced desires to succeed, take risks and grow to grow either in size or in business management.

   Self-leading capabilities and skillset describe the experience which owner-managers have to gather to control themselves and their business. If the owner-manager wants to grow the ME, he should rise his self-leading capabilities and skillset to the level which is needed to succeed in a more complex business environment. This may include capabilities like time management and ability to recover from stress and skillsets like social media marketing and bookkeeping.

   Employee capabilities indicators
   Employee indicator group includes the indicators which the ME´s employees have, and which can be used to foster business growth. This includes indicators "Teamworking Factors" (modified from Friar & Meyer (2003)), and "Utilization of Employee Resources" (modified from Gherhes et al. (2016)).

   Teamworking factor describes ME´s teamworking capabilities. Depending of the size of the ME, the teamworking can be measured between the owner-managers or owner-managers and employees. A good teamworking environment may foster growth whereas a bad teamworking environment may slow growth.

Utilization of employee resources describes ME´s ability to use employees and their skillsets effectively. When the ME grows, the owner-manager cannot anymore do everything by himself. Instead, he has to rely more and more to his employees, so the utilization of employee resources becomes a critical indicator of the MEs success.

2) **Operations key area indicators**
   Operations key area includes "Network" (modified from Kumcu et al. (1995)), "Process Efficiency" (modified from Hänninen et al. (2017), "Modernity of the Practices" (modified from Greenbank (2000)), "Adaptability of the Business Model" (modified from Hänninen et al. (2017)) and "Financial Management" (modified from Lussier &Sonfield (2015)) indicators.

   Network indicator
   Network indicator describes the strength of the ME´s co-operation network. MEs´ networks are often smaller than networks of larger companies and networking and improved networking utilization can help MEs to grow

   Process efficiency indicator
   Process efficiency indicator measures the efficiency of ME´s processes. ME owner-managers tend to be less organized in their managerial activities compared to the managers of the larger companies. This may lead to ineffective processes that may slow down or prevent the growth of the ME. Focusing on fulfilling ME´s key processes and outsourcing non-key processes improves MEs´ ability to grow and maintain growth.

   Modernity of the practices indicator
   Modernity of practices indicator measures how up-to-date ME´s operational processes are. MEs tend to have underdeveloped capabilities in the key business areas which may slow down or prevent MEs growth.

   Adaptability of the business model indicator
   Adaptability of the business model indicator measures the quality of ME´s business model. Business model development can help MEs to grow but many MEs tend to have underdeveloped business models that aren´t revisited and updated.

   Financial management indicator
   Financial management indicator measures the level of financial management in the ME. MEs´ financial management is often underdeveloped which may become the bottleneck when the ME grows. The development of in-house financial management readiness and smart use of external professional financial services may help MEs to grow.

3) **Customer Relations key area indicators**
   Customer Relations key area includes "Customer Network Utilization" (modified from Nukunen et al (2017)), "Outlining of the Customer

Segments" (modified from Hänninen (2017)), "Sales and Marketing" (modified from Hänninen (2017)), and "Awareness and Understanding of the Customer Needs" (modified from Nikunen et al. (2017)) indicators.

Customer network utilization indicator
Customer network utilization indicator describes how well the ME makes use of its customer network. MEs tend to focus more on acquiring customers when the focus should be put more on customer preferences to commit existing customers and retain their loyalty. MEs should invest in modern, integrated digital tools to improve customer relationships.

Outlining of the customer segments indicator
Outlining of the customer segments indicator describes how well the ME has defined its customer segments and how capable it's to acquire new customer segments. Smart and predictive use of customer segments can help MEs to grow.

Sales and marketing indicator
Sales and marketing indicator measures the efficiency of ME´s sales and marketing activities. Improved sales and marketing activities can help MEs to grow.

Awareness and understanding of the customer needs indicator
Awareness and understanding of the customer needs indicator describes how well the ME understands its customer needs.

- **What are the levels for the indicators?**
  According to the SLR, most of the article pool´s articles used a five-level maturity approach, but the definition of these levels was different between the models. In each model, bigger maturity level meant better maturity in the maturity area. The SLR also pointed out, that the levels should have internal validity: they should be connected logically to maturity forming an evolutionary path to maturity.

According to these findings and the overview of the literature, the author decided also to use a five-level maturity approach. As definitions, the author decided to use Paulk´s (1995) original CMM definitions as they are internally validated and used in many maturity models with good results. Hence, the ME maturity model includes the following levels: level one – initial, level two – managed, level three – defined, level four – quantitatively managed and level five – optimized

What are the dimensions in the model?
The ME maturity model is a two-dimensional matrix model. It has two dimensions: X, Y. X-dimension includes all the key areas whereas Y-dimension includes all the levels in the order. As in CMM, level 1 is the lowest level and level 5 is the highest level.

6.3 Conclusion

By following the ME maturity model roadmap defined in part 6.1 B, the steps "model structure design" and "model structure development" were fulfilled in part 6.2 B. By combining all the decisions made in part 6.2 B together, the first version of the ME business maturity model structure was formed (figure 30). It consists of three key areas that each has the criteria which define MEs level in that key area. The criteria are the performance indicators set to the key areas. In the future, these performance indicators can be measured in the case companies by using the ME maturity model questionnaire.
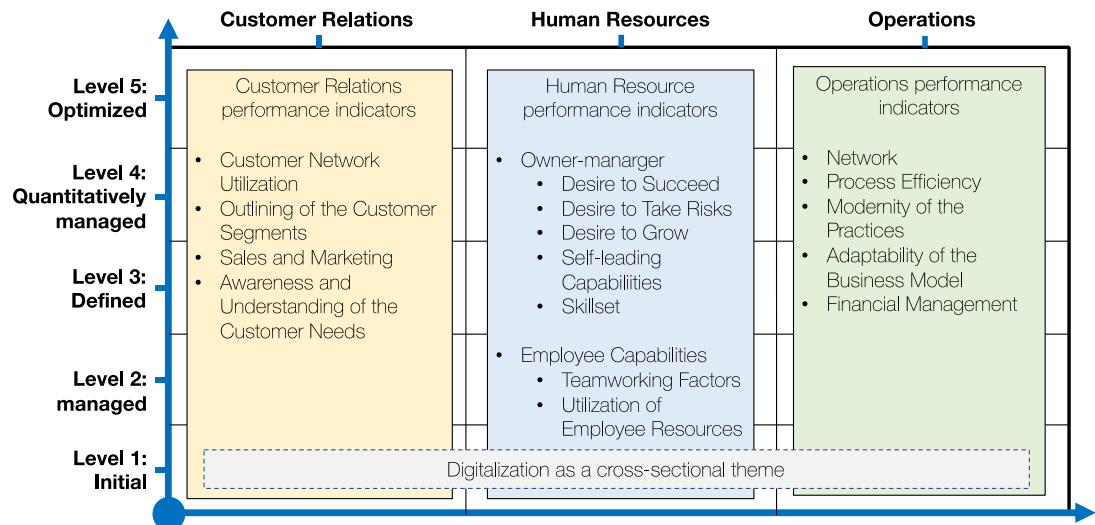

Figure 30: 1st version of the ME maturity model structure

7 CONCLUSION

The thesis aimed to form a new growth maturity model that can be used to develop MEs, business maturity. The goal of the thesis was to understand, what kind of maturity model could help MEs in long-term growth and business management. The main results of the thesis are the 1st version of the ME maturity model structure and the ME maturity model roadmap.

Addition the main results of the thesis, one of the biggest contributions of the thesis is the SLR which is quite unusual in Industrial Engineering and Management master thesis. It brings credibility to the thesis and turned out to be a complex but rewarding learning experience for the author.

Before finishing the thesis, the following subchapters discuss the thesis research merits and platform for future research. First, the thesis´s contribution to the research is evaluated. Next, the thesis is evaluated. Finally, topics for future research are discussed.

7.1 Contribution of the research

Maturity models are a versatile but scattered research area. As experienced during the SLR, many maturity model articles go to a very specific field and general conclusions are time to time hard to make (e.g. ID: 22) Sometimes, the used terminology or the complexity of the presentation makes it hard to understand what kind of model some of the articles are building. As the SLR showed, it seems that there is no established roadmap for maturity model development. Instead, the articles tend to create their own maturity model roadmap by making use of previous research (e.g. ID: 2, 9). Still, these roadmaps have similar steps that can be combined as was done in the thesis.

The scope of the term "maturity model" had differences in the literature. Most of the articles recognized that a maturity model is a model that measures maturity through a maturity assessment. However, some of the articles split maturity model further to structure, questionnaire, method and tool parts which brought new perspectives to maturity research (ID: 12). Also, the approach and the scope of the model validation had differences between the articles. Some of the validation processes were simple and fast (e.g. ID: 13) whereas others were slow and complex (e.g. ID: 23). It seems that it's hard to describe, how much validation is enough to accept the model.

Maturity models and growth tend to be tied together in the research. Growth has been researched in high detail. Multiple approaches for the business growth have been presented and it can be measured with diverse indicators (e.g. Coad, 2007; Delmar, 2006). Business growth has been addressed in different contexts, for example in large companies and SMEs. However, ME growth research seems to be lacking and should be researched more. As the group of MEs includes a lot of owner-managers with different age and skillset (e.g. Burns, 2010; Greenbank, 2000), it seems important that owner-managers digitalization skillset and learning capabilities are researched more.

Overall, the thesis helps to bring existing research together combining research from specific maturity model research articles together to make conclusions. Hence, it contributes to make the business maturity and growth management overview in the field

of business maturity models. The maturity roadmap is structured in a general manner, so it can be applied in many different fields. This brings more clarity to future maturity model research. Finally, the maturity model structure identifies some of the key areas and indicators which have a key role in the ME business growth. In a good maturity model making manner, it is flexible for future additions and can be applied in many kinds of ME research.

7.2 Evaluation of the thesis

The evaluation of the thesis is divided into five subparts: fulfillment of the research questions, review of the overview of the literature, review of the SLR, review of the construction of the ME maturity model, thesis value for MicroENTRE, and author´s self-assessment.

7.2.1 Fulfillment of the research questions

To review the fulfillment of the set research questions, the fulfillment of the secondary research questions and the fulfillment of the primally research question were reviewed.

1) **Secondary research question: What kind of growth and business maturity models are presented in the literature?**
    This research question was answered by doing the SLR. The SLR´s goal was to systematically identify relevant growth and business maturity models from the literature. First, this led to 1122 articles which were then filtered to 25 most relevant articles which were then reviewed. This review led to the identification of different types of growth and business maturity models which were listed to cluster A and cluster B comparison matrixes (Appendix 1 & Appendix 2).

    According to these findings, there is a diverse group of growth and business maturity models in the literature. Focus, key areas and levels are some of the factors that differentiate the models from each other. Many of the models go to very specific areas like master data management or industry 4.0. Key areas included different areas of business, levels of flaws and business capabilities. Types of level structures include mostly five-step models but also some differences like different level structures for the model's different key areas.

    Overall, according to the author´s own judgment, the research question was fulfilled.

2) **Secondary research question: What kind of needs MEs have for growth and business maturity models?**
    As stated by Falk et al. (2014), general maturity models tend to be too universal to provide real value for MEs. Hence, a specific ME focused maturity model is needed. To build a foundation for the specific model and answer to the research question, chapter two, Business maturity and growth management, identified MEs growth management capabilities in the subchapter 2.3.

    MEs´ needs for growth and maturity models are combined in chapter 2.3 subparts: Findings of basic characteristics of MEs, Managerial activities in MEs

and Other findings from previous ME growth research. To mention some of many examples, MEs suffer from resource scarcity, time management challenges, and underdeveloped capabilities. They are managed mainly by their owner-manager or owner-managers who are challenged day to day in their managerial activities. Advanced training of owner-managers, business model capabilities and use of modern, integrated digital tools are some of the factors that affect the growth capabilities of the MEs.

These and the other findings from the chapter 2.3 describe the needs of MEs for growth and maturity models, that are then used to form the ME maturity model structure. Hence, according to the author´s own judgment, the research question was fulfilled.

3) **Secondary research question: How growth maturity model should be built and used?** This research question was answered by analyzing the SLR article group in chapter five, Analyze of the article group, and making conclusions from it in chapter six, Construction of micro-enterprise focused maturity model.

Chapter five divided the article group analyzes into three themes and their subthemes. Theme two: How the model is created, and its subthemes: Maturity model structure and Maturity model roadmap taught about maturity model building and theme three: How the model is used and its subthemes: Model validation, Model validation analyze, and Model assessment taught how the model could be used. These themes included findings from many different articles from the article pool which were combined together to create an overview and understanding about the topics.

The overview made in chapter five was then used in chapter six to define the ME maturity model roadmap. The ME maturity model roadmap combined findings from the overview to create a new maturity roadmap that takes into account findings from many different articles from the article pool. When the ME maturity model roadmap was constructed, it was used as a tool to lead the building and using of the ME maturity model. It could also be used in the future to build and use different types of general and specific maturity models.

Overall, according to the author´s own judgment, the research question was fulfilled.

4) **Primary research question: What kind of maturity model can help MEs in long-term growth and business management?**
The primary research question was answered by answering secondary research questions and building the maturity model structure and the ME maturity model structure.

According to conclusions made from the SLR, maturity models consist of structure, questionnaire, method and tool subparts. The decision was made to focus only on the structure subpart in the scope of the thesis. Hence, the thesis doesn´t build a full ME maturity model: questionnaire, method, and tool subparts are not included.

The lack of the full ME maturity model doesn´t mean that the primary research question is left unanswered. The ME maturity model structure builds a base for the maturity model with its key areas and indicators which define what type of questionnaire, method, and tool could be used to test the model. Also, the ME maturity model roadmap provides instructions for all steps of the full ME maturity model, two of which are left out from the scope of the thesis.

Hence, even thou the questionnaire, method, and tool subparts are left to be decided by further research, the thesis builds the base and instruction which can be used to build them. Overall, according to the author´s judgment, even that the scope of the model evolved during the thesis, the primary research question was fulfilled.

7.2.2 Review of the systematic literature review

Conclusion: Systematic research procedure Part A
To review how well Part A fulfilled set goals, the fulfillment of each step and overall results were reviewed.

1) **Review of the fulfillment of set steps**
   Step 1A, use of SLR, was reasoned by pointing out that SLR helps to provide a comprehensive and heterogenic sample of the data which is important in this thesis. Step 2A, definition of research material and databases, was fulfilled. The focus of the research material was narrowed to established peer-reviewed journal articles and the focus of the databases was narrowed to Scopus and Web of Science.

   Step 3A, definition of keywords and search processes, was fulfilled through a documented multistep trial-and-error process. Step 4A, conduction of inclusion exclusion analyze, was fulfilled by adopting classification-criteria from the literature and using it to narrow down the material. Finally, step 5A, conduction of category and group separation, was fulfilled by adopting cluster methodology from the literature and using it to cluster the material.

   Overall, according to the author´s judgment, the systematic research procedure was fulfilled as planned.

2) **Overall review of Part A**
   The search list developed well during step 3A. Splitting search words to topic groups was a good approach to improve the efficiency of the search list.

   The inclusion exclusion process was efficient: the article group was narrowed from 1122 to 25 articles. However, title and abstract level inclusion exclusion criteria could have been more unified. Also, AJG ranking ≥ 3 criteria probably narrowed some interesting articles out of the scope of the thesis but it had to be used to narrow the article group to the scope of the thesis.

   Categorization and visualization of the article group went well and led good summaries. However, categories of Cluster A and Cluster B could have been more unified. Overall, it was hard to define in advance what categories should be included in clusters. Hence, the categories could be still improved further.

Conclusion: Systematic research procedure Part B

To review how well Part B fulfilled set goals, the fulfillment of each step and overall results were reviewed.

1) **Review of the fulfillment of set steps**

   Step 1B, conduction of thematic analyze, was reasoned by connecting themes to set research questions. After some iterations, the author came up with the presented themes and sub-themes method which helped to structure findings from articles. By using this approach, findings from individual articles could be combined well with summaries made from the article pool as a whole.

   Step 2B, conclusions from thematic analyze was a logical continuum for the Step 1B as it concluded the main findings from Step 1B. Conclusions from all three themes were presented separately and their structure followed the structure of the overview chapter´s conclusions which helps to compare and mix these findings together.

   Overall, according to the author´s own judgment, analyze of the article group was conducted as planned.

2) **Overall review of Part B**

   Using thematic analyze was a good approach to combine findings from a diverse mix of the articles. Use of tables to visualize main findings from selected articles was useful but sometimes constructing them was complicated as the descriptions had to be in some cases rephrases to achieve clear terminology throughout the thesis. Hence, there is a risk that some of these rephrase lost some of the meaning from their original context.

   Arriving to conclusions from thematic analyze was straightforward and led to many factors that should be taken into account when the maturity model is formed, tested and analyzed. However, the mix of these factors is diverse, and it seems quite certain that all of them cannot be taken into account in the model. Hence, the fulfillment of them has to be reviewed subjectively.

Review of the fulfillment of systematic literature review criteria

To review the SLR, criteria found from Khan et al., (2003) and Grant & Booth, (2009) were used. These included basic requirements of SLR and basic characteristics of SLR research: selection bias and data extraction bias.

1) **Basic requirements of SLR**

   Khan et al. (2003) point out that SLR is based on clearly formulated question, it identifies relevant studies around SLRs topic, and summarizes evidences from the review. These requirements were fulfilled in the thesis. The SLR was based on a clearly formulated research question. Relevant studies around the topic were identified through the SLR methodology. Finally, evidences from the SLR were summarized at the end of the SLR methodology.

   Grant & Booth (2009) point out that SLR should identify all the research around research questions with specific criteria to give an unbiased and balanced summary of the literature around the topic. The thesis fulfilled this requirement through research questions and the SLR methodology.

2) Selection bias

Selection bias, the author chooses only the research material which is consistent with his personal research goals and opinions, was minimized by setting inclusion and exclusion criteria for different steps of the SLR methodology. However, some of these criteria could have been done more objectively. For example, the search words and the topic groups in the SLR Step 3 were identified through a trial-and-error. Hence, there is a risk that the material was affected by selection bias. The same can also be said about the SLR Step 5 where the categorization and visualization were conducted. Sometimes it was hard to decide should the article be categorized into cluster A or cluster B. Hence, others could have made the categorization differently.

However, according to the authors judgment, selection bias was minimized well enough through the thesis to fulfill the characteristics of SLR research.

3) Data extraction bias

Data extraction bias, the author takes too much or too little data from the included studies, was minimized in the thesis by using the help of two supervisors when SLR data was reviewed and extracted. This fulfilled the requirement set by Nightingale (2009) and Liberati et al. (2009) who emphasize that the SLR data should be reviewed at minimum by two reviews. They also emphasized that the SLR data should be extracted by using the standardized form with a clearly defined exclusion reason. This was fulfilled by using a structured excel-sheet to implement inclusion and exclusion steps through the SLR methodology.

Hence, according to the authors judgment, data bias was minimized well through the thesis to fulfill the characteristics of SLR research.

7.2.3 Review of the construction of the ME maturity model

As the focus of the thesis was to build the ME maturity model structure, this part focuses on the review of the construction of the ME maturity model structure.

The ME maturity structure was built according to the findings of Boughzala & De Vreede (ID: 12). According to the author´s judgment, Boughzala´s & De Vreede´s approach to the Col-MM maturity model structure was understood and applied correctly to the ME maturity model. The author tried to avoid misunderstandings in this process by visualizing the interpretation of Boughzala´s & De Vreede´s structure sub-part and by following the defined ME maturity model roadmap.

Some of the areas that could have been done better are the streamlining of the ME maturity model roadmap and the definition of performance indicators. Maturity model roadmap streamlining was done by setting similar terms in hierarchical order and then choosing the best terms for the ME maturity model roadmap. As the terms are similar but don´t necessarily mean the same thing, there is a chance that the meaning of some of the terms evolved or changed a little bit from how they were presented in the original articles. However, according to the authors judgment, the streamlining was done well, and the terms retained their original meanings. Performance indicators on the other hand could have been structured more efficiently. Indicators like Customer relations, customer network utilization could probably be combined either under the same indicator or indicator group if more time would have been used to define them.

However, according to the author´s judgment, the performance indicators are good for the 1st version of the maturity model structure. The key areas and the indicators will evolve when the maturity model structure is tested so using time for performance indicator structuring is not necessary the best option before the first case test results.

Overall, according to the author´s own judgment, the construction of the ME maturity model structure went well.

7.2.4 Thesis value for microENTRE

Doing the thesis at the MicroENTRE was a nice experience. Even thou the author got stuck from time to time with the SLR and construction of the ME maturity model, it always easy to get help for the problems.

As mentioned in chapter one, the thesis part of MicroENTRE´s SoloENTRE project. In the SoloENTRE project, the thesis focus is on growth management in the e-service subproject. The thesis supervisor Kai Hänninen, project manager of the SoloENTRE project, expected that the thesis would build a new ME focused maturity model which could be used in the SoloENTRE project to measure North Ostrobothnia´s MEs´growth capabilities.

According to the author´s own judgment, the thesis fulfilled this goal and its results can be used and developed further in the SoloENTRE project.

7.2.5 Author´s self-assessment

Creating the thesis was a more complex task than the author expected. At the start, it took a while to get a basic understanding of maturity and growth models to be able to define the research questions. The research questions were reviewed multiple times in detail as it was hard to define clear research questions that fulfilled the requirements set to the thesis but weren´t too wide. However, according to the author´s own opinion, the research questions were set well in the scope of the thesis.

Creating the SLR was one of the most complex tasks in the thesis. The author hadn´t really done any SLR before the thesis and there were no existing SLR that could be applied well to the thesis. Hence, the author used first a lot of time to examine SLR articles from high-quality entrepreneurship-related peer-reviewed journals to identify best SLR practices in the field of entrepreneurship research. The findings from these articles were then used to define the author´s own systematic research methodology for the thesis. According to the author´s own judgment, this systematic research methodology was well combined, and it was followed well through the thesis.

Overall, according to the author´s own judgment, even that there were multiple challenges throughout the thesis, the author managed to beat them and arrive to the conclusion which fulfilled goals set by the author.

7.3 Topics for the future research

The thesis provides a lot of topics for future research in the scope of the SoloENTRE project. First of all, the ME maturity model should be finished by fulfilling the ME maturity model roadmap steps left outside of the scope of the thesis. This includes steps: "Model deployment & evaluation" and "Model maintenance" (figure 31). Naturally, by fulfilling these steps, questionnaire, method, and tool subparts of the ME maturity model are constructed. With this, the ME maturity model is ready to be tested in the case companies. According to the results from the case company tests, the model is then improved and tested again in the cycle which leads to the best version of the ME maturity model.

Model deployment & evaluation	**[Outside of the focus of the thesis]**
	- How the model implementation responsibilities are divided?
	- How the model is validated?
	- How the success of the model is verified?
	- How the model is applied in companies?
	
	- How the model is tested in the companies?
	    o How topic areas are tested
	    o How hierarchy of the maturity levels is tested
	    o How tools, techniques and concepts are tested
	
	- How the primary collaborators are defined?
	- How construct, content and external validity of the model are evaluated?

Model maintenance	**[Outside of the focus of the thesis]** - How to promote the adaptability of the model? - How to guarantee reporting and information exchange? - How to guarantee flexibility and the growth of the model? - How to improve the model according to the test results - How the model is benchmarked? - How the results from the model assessment are maintained in databases? - How the development process and the results are communicated?

Figure 31: Steps from the ME maturity model roadmap that are left outside the focus of the thesis.

The thesis provides also opportunities for other researchers to continue this research or use it part of their own research to improve the growth of the MEs. The ME maturity roadmap provided in the thesis can be applied in different areas and the ME maturity model structure can be used with different types of MEs.

According to the discussions within MicroENTRE, there is a wish that the author would write a journal article related to findings done in the thesis. The author aims to continue his research by writing this article and continuing the research from the scope of the thesis. It´s yet unknown where this journey may lead.

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9 APPENDIXES

Appendix 1: Cluster A comparison matrix

ID	NAME OF THE ARTICLE	FOCUS OF THE MODEL	KEY AREAS	MATURITY LEVELS	REFERENCE
1	Defining and assessing industry 4.0 maturity levels – case of the defence sector	Industry 4.0	Key area 1: Factory of the future Key area 2: People and culture Key area 3: Strategy	Level 1: Minimal Level 2: Development Level 3: Defined Level 4: Excellence	Bibby, L., & Dehe, B. (2018). Defining and assessing industry 4.0 maturity levels–case of the defence sector. Production Planning & Control, 29(12), 1030-1043.
2	Measuring chain digitisation maturity: an assessment of Dutch retail branches	Chain digitisation	Key area 1: Technology Key area 2: Organization	Technology 1: No chain automation 2: E-business 3: E-Collaboration 4: Open, n-tier sourcing Organization 1: No chain collaboration, 2: Bilateral collaboration, 3: Multilateral collaboration, 4: Extended chain collaboration	Plomp, M. G., & Batenburg, R. S. (2010). Measuring chain digitisation maturity: An assessment of Dutch retail branches. Supply Chain Management: An International Journal, 15(3), 227-237.
4	MD3M: The master data management maturity model	Master data management	Key area 1: Data model Key area 2: Data quality Key area 3: Usage and ownership Key area 4: Data protection Key area 5: Maintenance	Level 1: Initial Level 2: Repeatable Level 3: Defined process Level 4: Managed & measurable Level 5: Optimized	Spruit, M., & Pietzka, K. (2015). MD3M: The master data management maturity model. Computers in Human Behavior, 51, 1068-1076.
5	Fixing the cracks in the crystal ball: A maturity model for quantitative risk assessment	Quantitative risk assesment	Key area 1: Level 1 flaws Key area 2: Level 2 flaws Key area 3: Level 3 flaws Key area 4: Level 4 flaws	Level 1: Unrepeatable Level 2: Invalid Level 3: Valid but inaccurate Level 4: Accurate but challengable Level 5: Ideal	Rae, A., Alexander, R., & McDermid, J. (2014). Fixing the cracks in the crystal ball: a maturity model for quantitative risk assessment. Reliability Engineering & System Safety, 125, 67-81.
7	The development of a supply chain management process maturity model using the concepts of business process orientation	Supply chain management	Key area 1: Business process orientation Key area 2: Process capability	Level 1: Ad Hoc Level 2: Defined Level 3: Linked Level 4: Integrated Level 5: Extended	Lockamy III, A., & McCormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. Supply Chain Management: An International Journal, 9(4), 272-278.
8	A maturity model based CoP evaluation framework: A case study of strategic CoPs in a Korean company	Communities of Practice	Key area 1: Building CSF group Key area 2: Growth CSF group Key area 3: Adaptive CSF group Key area 4: Close CSF group	Level 1: Building Level 2: Growth Level 3: Adaptive Level 4: Close	Lee, J., Suh, E. H., & Hong, J. (2010). A maturity model-based CoP evaluation framework: A case study of strategic CoPs in a Korean company. Expert Systems with Applications, 37(3), 2670-2681.
9	Using experts to develop a supply chain maturity model in Mexico	Supply chain management	Key area 1: Views Key area 2: Abstraction level Key area 3: Life cycle	Level 1: Undefined Level 2: Defined Level 3: Manageable Level 4: Collaborative Level 5: Leading	Garcia Reyes, H., & Giachetti, R. (2010). Using experts to develop a supply chain maturity model in Mexico. Supply Chain Management: An International Journal, 15(6), 415-424.
10	A business maturity model of software product line engineering	Software product line	Key area 1: Market orientation Key area 2: Relationship management Key area 3: Order of entry to the market Key area 4: Financial management Key area 5: Assets management	Level 1: Reactive Level 2: Awareness Level 3: Extrapolate Level 4: Proactive Level 5: Strategic	Ahmed, F., & Capretz, L. F. (2011). A business maturity model of software product line engineering. Information Systems Frontiers, 13(4), 543-560.
11	Conception, development and implementation of an e-Government maturity model in public agencies	E-Goverment	Key area 1: Vision, strategy and policy Key area 2: Enterprise architecture strategy Key area 3: IT management and organization	Level 1: Initial capability Level 2: Developing capability Level 3: Defined capability Level 4: Managed capability Level 5: Integrated capability	Valdés, G., Solar, M., Astudillo, H., Iribarren, M., Concha, G., & Visconti, M. (2011). Conception, development and implementation of an e-Government maturity model in public agencies. Government Information Quarterly, 28(2), 176-187.
12	Evaluating Team Collaboration Quality: The Development and Field Application of a Collaboration Maturity Model	Collaboration	Key area 1: Collaboration characteristics Key area 2: Collaboration management Key area 3: Collaboration process Key area 4: Information and knowledge integration	Level 1: Ad Hoc Level 2: Exploring Level 3: Managing Level 4: Optimizing	Boughzala, I., & De Vreede, G. J. (2015). Evaluating team collaboration quality: The development and field application of a collaboration maturity model. Journal of Management Information Systems, 32(3), 129-157.
13	Mind the gap – Assessing maturity of demand planning, a cornerstone of S&OP	Sales and operations planning	Key area 1: Data Key area 2: Method Key area 3: Performance Key area 4: System Key area 5: People	No defined levels	Vereecke, A., Vanderheyden, K., Baecke, P., & Van Steendam, T. (2018). Mind the gap–Assessing maturity of demand planning, a cornerstone of S&OP. International Journal of Operations & Production Management, 38(8), 1618-1639.
14	A Maturity model for hospital information systems	Hospital information system	Key area 1: Data analysis Key area 2: Strategy Key area 3: People Key area 4: Electronic medical record Key area 5: Information security Key area 6: Systes and IT infrastructure	Level 1: Stage I Level 2: Stage II Level 3: Stage III Level 4: Stage IV Level 5: Stage V Level 6: Stage VI	Carvalho, J. V., Rocha, Á., van de Wetering, R., & Abreu, A. (2019). A Maturity model for hospital information systems. Journal of Business Research, 94, 388-399.
15	A maturity model for enterprise risk management	Eterprise risk management	Key area 1: Organization Key area 2: Technicality Key area 3: Transparency Key area 4: Involvement	Level 1: Insufficient Level 2: Contingency Level 3: Structured Level 4: Participative Level 5: Systemic	Oliva, F. L. (2016). A maturity model for enterprise risk management. International Journal of Production Economics, 173, 66-79.
16	Framing maturity based on sustainable operations management principles	Sustainable operations management	Key area 1: Incbound and outbound logistics Key area 2: Operations Key area 3: Marketing and sales Key area 4: After-service Key area 5: Firm infrastructure Key area 6: Human-Resource management Key area 7: Technology development	Level 1: Compliance and conformity Level 2: Operations'ecoefficiency Level 3: Sustainability management system Level 4: Network and stakeholders' integration Level 5: Sustainable operation's integration	Machado, C. G., de Lima, E. P., da Costa, S. E. G., Angelis, J. J., & Mattioda, R. A. (2017). Framing maturity based on sustainable operations management principles. International Journal of Production Economics, 190, 3-21.
22	Maturity levels for interoperability in digital government	Interoperability in digital goverment	Key area 1: Organizational interoperability	Level 1: Computer interoperability Level 2: Process interoperability Level 3: Knowledge interoperability Level 4: Value interoperability Level 5: Goal interoperability	Gottschalk, P. (2009). Maturity levels for interoperability in digital government. Government Information Quarterly, 26(1), 75-81.
24	Configuration lifecycle management maturity model	Configuration lifecucle management	Key area 1: Strategy and performance Key area 2: Processes Key area 3: Information technology Key area 4: Organization Key area 5: Knowledge and support	Level 1: Initial Capabilities Level 2: Department commitment Level 3: Cross-organizational specialization Level 4: External focused expertice Level 5: Continuous improvement	Myrodia, A., Randrup, T., & Hvam, L. (2019). Configuration lifecycle management maturity model. Computers in Industry, 106, 30-47.
25	Energy and utility management maturity model for sustainable manufacturing process	Energy and utility management	Key area 1: Project related Key area 2: Management related Key area 3: Organization related Key area 4: Analyze related	Level 1: Initial Level 2: Managed Level 3: Defined Level 4: Qiantitatively managed Level 5: Optimized	Ngai, E. W. T., Chau, D. C. K., Poon, J. K. L., & To, C. K. M. (2013). Energy and utility management maturity model for sustainable manufacturing process. International Journal of Production Economics, 146(2), 453-464.

Appendix 2: Cluster B comparison matrix

ID	NAME OF THE ARTICLE	SUMMARY OF FINDINGS	MODEL LEVELS	REFERENCE
3	Structural elements of coordination mechanisms in collaborative planning processes and their assessment through maturity models: Application to a ceramic tile company	Maturity model development roadmap is developed	Steps of the roadmap: 1: Scope, 2: Design, 3: Populate, 4: Deploy, 5: Maintain	Cuenca, L., Boza, A., Alemany, M. M. E., & Trienekens, J. J. (2013). Structural elements of coordination mechanisms in collaborative planning processes and their assessment through maturity models: Application to a ceramic tile company. Computers in Industry, 64(8), 898-911.
6	A Quality-Distinction Model of IT Capabilities: Conceptualization and Two-Stage Empirical Validation Using CMMi Processes	CMMI based QD model is researched and identified supperior to prior CMM based QD model	–	Kishore, R., Swinarski, M. E., Jackson, E., & Rao, H. R. (2011). A quality-distinction model of IT capabilities: conceptualization and two-stage empirical validation using CMMi processes. IEEE Transactions on Engineering Management, 59(3), 457-469.
17	Revealing performance heterogeneity through knowledge management maturity evaluation: A capability-based approach	Cabability-based KM evaluation framework is developed	KM development level 1: Undeveloped, ": Underdeveloped, 3: Developing, 4: Developed, 5: Highly developed	Chen, L., & Fong, P. S. (2012). Revealing performance heterogeneity through knowledge management maturity evaluation: A capability-based approach. Expert Systems with Applications, 39(18), 13523-13539.
18	Value of maturity models in performance measurement	Value of performance maturity models is investigated	Evaluation tool evalution level: 1: Basic, 2: Intermediate, 3: Advanced Evaluation tool evaluation sub-levels: 1: Worse, 2: Right, 3: Better	Bititci, U. S., Garengo, P., Ates, A., & Nudurupati, S. S. (2015). Value of maturity models in performance measurement. International journal of production research, 53(10), 3062-3085.
19	Antecedents and Effects of CIO Supply-Side and Demand-Side Leadership: A Staged Maturity Model	Maturity relationship between CIO supply and demand side leadership is proven	–	Chen, D. Q., Preston, D. S., & Xia, W. (2010). Antecedents and effects of CIO supply-side and demand-side leadership: A staged maturity model. Journal of Management Information Systems, 27(1), 231-272.
20	Selection priority of process areas based on CMMI continuous representation	Tool to support CMMI decisions is created	–	Huang, S. J., & Han, W. M. (2006). Selection priority of process areas based on CMMI continuous representation. Information & Management, 43(3), 297-307.
23	Assessing Organizational Capabilities: Reviewing and Guiding the Development of Maturity Grids	Maturity model development roadmap is developed	Steps of the roadmap: 1: Planning, 2: Development, 3: Evaluation, 4: Maintenance	Maier, A. M., Moultrie, J., & Clarkson, P. J. (2011). Assessing organizational capabilities: reviewing and guiding the development of maturity grids. IEEE transactions on engineering management, 59(1), 138-159.