UNIVERSITY OF EASTERN FINLAND
Faculty of Social Sciences and Business Studies
Business School

IS CIRCULAR ECONOMY THE NEW BLACK?

BUSINESS OPPORTUNITY RECOGNITION WITHIN COMPANIES WITH WOOD APARTMENT BUILDING EXPERIENCE OPERATING IN THE FINNISH MARKET

Master's Thesis, Innovation Management
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31 October 2019

Abstract

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Title **Is circular economy the new black?** Business opportunity recognition within companies with wood apartment building experience operating in the Finnish market			
Main subject **Innovation Management**	Level **Master's degree**	Date **31 October 2019**	Number of pages **89 and 1 Appendix (2 pages)**

Abstract

The goal for this study is to find out the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building using timber, and understand how SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities. The context is set within these limits and located in Finland. In this study wood construction is seen as a part of the circular economy by its core element. By this it is meant that it belongs within the biological cycles with its renewable form, but also its features as a carbon sink.

The theoretical framework of this study is built with the theories concentrating on business opportunity recognition and opportunity construct, lifting up the issues how the opportunities are recognized and what are the influencing factors behind opportunity recognition. The framework continued beyond the discoverer level and concentrated also on opportunity with its many-sided form and their nexus.

This qualitative multiple-case study collected the data with semi-structured expert and SME interviews from the parties that had experience in timber apartment building projects in Finland. The data was collected during the autumn in 2019 and six interviews were conducted. The data was analysed with inductive content analysis and the literature research had been done largely beforehand.

The findings propose ten factors that had a connection with opportunity recognition and three of them were different than in the linear economy. Also, the opportunities were discovered, created or both depending on the context. The nexus was also playing a part with the effect of the characteristics that were connected with the discoverer but also with the characteristics that the opportunity had.

Keywords

opportunity recognition, opportunity construct, circular economy, wood construction, sustainable construction

Tiivistelmä

ITÄ-SUOMEN YLIOPISTO

Tiedekunta **Yhteiskuntatieteiden ja kauppatieteiden tiedekunta**	Yksikkö **Kauppatieteiden laitos**
Tekijä **Sini-Tuulia Suokas**	Ohjaaja **Kaisa Henttonen**

Työn nimi (suomeksi ja englanniksi)
Kiertotalous uusi mustako? Mahdollisuuksien tunnistaminen puukerrostalorakentamisessa Suomen markkinoilla / **Is circular economy the new black?** Business opportunity recognition within companies with wood apartment building experience operating in the Finnish market

Pääaine	Työn laji	Aika	Sivuja
Innovaatiojohtaminen	**Pro gradu -tutkielma**	**31. lokakuuta 2019**	**89 ja 1 liite (2 sivua)**

Tiivistelmä

Tutkimuksen tavoitteena on löytää tekijät, jotka vaikuttavat pienten ja keskisuurien yritysten mahdollisuuksien tunnistamiseen kiertotaloudessa, jonka osana puukerrostalorakentaminen nähdään, sekä ymmärtää miten pienet ja keskisuuret tunnistavat näitä mahdollisuuksia kiertotaloudessa eli tässä tutkimuksessa puukerrostalorakentamisessa. Tutkimuskonteksti on asetettu näiden raamien sisälle ja sijoitettu Suomeen. Puurakentamisen keskeiset elementit ovat sidoksissa uusiutuvaan materiaaliin ja luonnon kiertokulkuun, sekä talot itsessään toimivat hiilivarastoina.

Teoreettinen viitekehys, jota käytetään tässä tutkimuksessa, rakentuu yritysten mahdollisuuksien tunnistamiseen ja mahdollisuuden käsitteeseen, painottaen miten mahdollisuuksia tunnistetaan ja mitkä ovat vaikuttavat tekijät niiden tunnistamisessa. Teoreettinen viitekehys ei keskity vain mahdollisuuksien tunnistajaan vaan ottaa huomioon myös itse mahdollisuuden ja sen eri puolet, sekä näiden välisen vuorovaikutuksen.

Tässä laadullisessa tutkimuksessa tutkimustapa on monitapaustutkimus ja aineiston keruuseen käytettiin puolistrukturoituja asiantuntija- ja yrityshaastatteluja toimijoilta, joilla oli kokemusta puukerrostaloprojekteista Suomessa. Aineisto kerättiin syksyn 2019 aikana, jolloin pidettiin kuusi haastattelua. Aineisto analysoitiin induktiivisella sisällönanalyysillä ja suuri osa tutkimukseen käytettävästä kirjallisuudesta oli jo tässä vaiheessa etsitty.

Tutkimuksessa havaittiin kymmenen tekijää, joilla oli yhteys mahdollisuuksien tunnistamiseen ja kolme näistä oli eri kuin lineaarisessa taloudessa. Näytti myös siltä, että mahdollisuudet olivat luotuja sekä havaittuja, mutta myös molempia yhtä aikaa riippuen kontekstista. Myös vuorovaikutuksella havaittiin olevan yhteys havaitsijan ja häneen yhteydessä olevien tekijöiden sekä mahdollisuuden ja siihen vaikuttavien tekijöiden välillä.

Avainsanat
mahdollisuuksien tunnistaminen, mahdollisuuksien käsite, kiertotalous, puurakentaminen, kestävä rakentaminen

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1 INTRODUCTION

The circular economy is setting a lot of promises towards a sustainable economy. Consumption and sustainability have been widely discussed subjects. Lately there has been a lot of conversation about global warming in different channels and forums. Sustainability and the circular economy have gained also attention within companies with the possible opportunities it sets (EMF, 2013), but also among policymakers (Brennan et al., 2015, p.239). The issue has gathered a lot of attention and therefore makes it interesting to look at more closely and maybe even consider as a today's new normal rather than something special. The circular economy deserves attention by the promises it sets and therefore is worth to study. The circular economy and the idea of it were not born yesterday, but they are fairly new.

On national level the Finnish government has set the goal, among eight other objectives for sustainable development, that Finland will be in the leading role in the circular economy and sees it as a base line for the future economy. With the circular economy, the aim is to decrease the over-usage of natural resources and restrain climate change, but also to create a new field of work as well as strengthen competitiveness. Also, the goals are to decrease the carbon footprint within habitation and construction. One of the methods to support this is to support wood construction as the buildings are also carbon sinks. (Finnish Government, 2019)

Academic literature has also taken a fast-growing interest on the circular economy (Geissdoerfer et al., 2017, p.758). For a long time, there has been discussions about sustainability and recycling, but the linear economy does not support these factors by its core idea when the product is produced, consumed and then disposed. A linear economy produces the products from virgin raw materials and the loop for consumption is not closed. A circular economy brings up the possibility to use waste material as a raw material. There is a possibility to find new ways to do business and develop it to a more sustainable direction and possibility to reduce costs. (Murray et al., 2017, pp.369-374)

The circular economy is an antonym for the linear economy when viewed linguistically. A linear economy uses virgin material and after usage the products become waste. Throughout the circular economy literature, the term for a linear economy was born and mirrors the characterisation of both economy models. (Murray et al., 2017, p.371) The linear economy has caused environmental harm (Korhonen, Honkasalo & Seppälä, 2018, p.37). The linear economy focuses on consumption maximisation and expects unlimited resources as well as durability

from the environment. Within it is the thought that the intake of waste is infinite (Cooper, 1999, p.10). Then again, a circular economy reduces waste and takes it back into use as a raw material (Murray et al., 2017, p.371).

A circular economy offers a more sustainable way against over-usage and global warming (Murray et al., 2017, p.375). It promotes the possibility for equilibrium with nature, when comparing contemporary models and open-ended characterisation within the economy (Geissdoerfer et al., 2017, p.759). The goal is that manufacturing, refurbishment and product reuse are more efficient when considering energy usage (Korhonen, Honkasalo & Seppälä, 2018, p.38). A loop economy is conceptualised for industrial strategies to prevent waste, resource efficiency, for dematerialisation and job creation (Stahel & Reday, 1976, cited in Geissdoerfer et al., 2017, p.759).

Circular economy is a hot topic which has caught attention widely. It can be divided into several topics. When attention is turned to entrepreneurship, which is also a studied and well-known subject itself, business opportunity recognition forms a central part of it. Venture creation itself is also a central part of entrepreneurship (Shook et al., 2003, p.379). Entrepreneurial opportunity recognition has been under academic study for three decades and it plays an important role also nowadays. (Mary George et al., 2016, p.309) The discussion on the created opportunities or already existing discovered opportunities sets important ground for entrepreneurial actions and considers them in a variety of factual connections. (Alvarez & Barney, 2007, p.123)

1.1 The circular economy and business opportunity recognition

Entrepreneurship and the circular economy are widely recognised subjects as is business opportunity recognition. The circular economy is an important factor within the sustainable way of doing business even though they are not exactly the same matter, and business opportunity recognition is an intrinsic part of entrepreneurship. There is not much literature on business opportunity recognition within the circular economy companies. This is the gap which this study is focusing on. The promises that the circular economy sets with its principles for sustainable business makes it an interesting and relevant study subject. When the circular

economy is placed within entrepreneurship and the factors for business opportunity recognition studied, we are gaining a deeper understanding of a more sustainable entrepreneurship.

This study uses wood construction as a platform for research, more precisely wood construction within apartment buildings, and sees it as representing the circular economy. The circular economy itself sets many promises, but only few companies are able to prove to be part of the circular economy. One debate can be turned into that issue. There is no 100% circular economy business (Laubscher & Marinelli, 2014, p.3). In fact, the interesting question is when the business is a circular economy company and is it enough if some parts function on that field. Yet that is a matter for a future study. More important factor in this study is what drives the economy towards a more sustainable way. Acknowledging the possibilities that are already here even if they are without the label.

In Finland the field of wood construction has gained a lot of public attention in the last few years. In 2017, Yle reported that with wood construction the carbon footprint decreases almost by half when compared to concrete. Also, they announced that the architect matters in this factor. (Ikävalko, 2017) When looking only at the years 2018 and 2019, there has been a variety of articles around the subject and media has been following the phenomenon. Especially Yle has actively written about the subject. There has been success stories and future visions that sets wood construction in an interesting and important light with its ecological and carbon neutral qualities. (Mustonen, 2019a) In Joensuu, a 50 meters high apartment building is being built which will be the tallest in the Nordic countries (Rinta-Jouppi, 2019). Also, there has been setbacks with some projects, as Helsingin Sanomat informed in 2017 that in Jätkäsaari, Helsinki, there was mould found after the elements got wet (Bäckgren, 2017). Later Yle pointed out that one of the construction fields has had to be postponed in Riihimäki as there has been an investigation request left for the police (Mustonen, 2019b). All this shows that the field is still searching its form.

There is a strong atmosphere for wood construction, and it is seen to grow and becoming more common, having many benefits as well. (Mustonen, 2019a; Ristola, 2018). In November 2018, Rakennuslehti informed that wood construction has taken visible steps in market share (Mölsä, 2018). Helsingin Sanomat informed that wood construction will dominate the housing fair in Tuusula in 2020 and lifts up the growing interest towards the field (Kivinen, 2019). Also, wood construction has been seen as an answer to the problems concerning inside air, but also the trend is arising with the changing rules and regulations concerning wood construction. The field is

changing and developing. Finland may have a big potential to become a leading country in it according to Yle. (Korpela, 2018)

In this study, wood construction as a field is chosen under the magnifier. The old way of thinking that buildings would be something that are always standing still, something permanent, is breaking towards the idea that buildings have a life cycle which includes an end life. Material has always a lifecycle, and there can be influence on the material that the new buildings are built with. Wood's life cycle is such that it can be recycled and reused. It is a versatile and organic material that gives opportunity to work with material that has a clear lifecycle. (Wood Program – Architecture in Wood, 2018)

However, wood fits in construction with its many-sided capacity and it is a studied subject. It also saves time because of its features. (The Benefits of Wood in Building Construction, 2014) Wood is a renewable and pure source for construction. It is durable as a material but also timeless in design. In Finland the forest grows more wood than we are using. The level of protection of the forests in Finland is very high and most of the commercial forests are certified. (Why wood?, 2014) The companies are aware of the origin of the timber as the forest industry uses only legally acquired raw materials. The awareness of the origin of the product is the ground for the sustainable use of the forests. (Puuinfo, 2014a) When the forests are taken care of, they are an endless source of wood (Puuinfo, 2014b).

It could be debated whether wood construction is always part of the circular economy, but that is also a matter for another study. Responsibility and sustainability are such subjects within business that they easily get a "whether or not"-perspective or sometimes there is even talk about greenwash. This study is clear and transparent when it comes to these issues and do not claim that the studied context is entirely a part of the circular economy with all its forms and viewpoints. Here wood construction is seen to fit the context because of its core element being and dealing with a remarkable carbon sink. What makes this relevant and interesting platform to study is the benefits and natural elements that are bound into wood construction. There are several elements why wood construction can be seen as part of the circular economy and therefore setting a great platform for this study.

The research results suggest that there are ten factors that are connected with business opportunity recognition within the circular economy and that those opportunities are discovered, created or both depending on the context. Also, the entrepreneurial actions do not

stand alone. The discoverer and the factors influencing it build a nexus with a multi-dimensional opportunity and that is how the opportunities form.

1.2 The purpose of the study

This qualitative multiple-case study looks into business opportunity recognition in small and medium size enterprises (SME's). The focus is on companies that are operating within the circular economy; more precisely within the field of wood construction in Finland focusing on apartment houses made from timber. The attention is turned to the business opportunity recognition within the circular economy. The purpose of this study is to find out the features that play a part within business opportunity recognition for SME's operating in wood construction in Finland which is seen as a circular economy field in this study.

There are several different industries within the circular economy. As companies in general work in different areas, so does the companies within the circular economy. Since there is still a limited amount of companies under the circular economy in Finland, it sets challenges for collecting companies within a certain industry which are strictly circular economy companies. This study looks into the one industry to make it possible to compare the results within it. The interviewed parties are not representing only the circular economy. They are parties from our economy dealing with a method that is very much tied with the circular economy. Wood construction in Finland is chosen to be the context industry since by its core element wood is recyclable and supports the principles of the circular economy. It saves energy, stores carbon and is recyclable as well as renewable (A Sustainable Timber Skyline: The Future of Design, 2017).

The goal of this study is to seek the main factors for business opportunity recognition in the beginning of the operating years, but also later in the company's lifecycle when moving to an operating field within the circular economy, wood construction. The object is business opportunity recognition within the circular economy. The context, SME's within wood construction in Finland where the study is conducted, lies with the carefully selected expert and company interviews from the Finnish wood construction field.

The research questions are:

Research Question: What are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber?

Sub-question: How SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities?

This study is done under the supervision of the University of Eastern Finland and associated with the CICAT2025-project (the Strategic Research Council at the Academy of Finland, 2019, decision number 320209). The aim is to bring more knowledge on how business opportunities are recognized within the circular economy and the factors behind it. Academically the benefits are to add more understanding of SME's within the circular economy and practically to gain more knowledge for future companies to be able to spot the opportunities and benefit from those. Also, this study is worth conducting because the circular economy is a highlighted topic for sustainable matters and adding more knowledge on business opportunity recognition within the sector creates a better starting point for new circular economy companies, not forgetting the policymakers. As this study focuses on important fields where the current interest lies in, the study may bring some valuable insight into the matter.

A circular economy offers a different solution for doing business than a linear economy as presented above. However, all-sized enterprises face challenges but the bigger ones have more resources to tackle them. (Rizos et al., 2016, p.1213) It is also important to acknowledge that despite the increasing interest towards the circular economy it does not guarantee the success within it. Overall, the circular economy is not spread too widely and recognised well enough, leaving it still quite niche. (Kirchherr et al., 2018, pp.265,270)

This study does not directly look into the barriers of the circular economy, but understanding and acknowledging their existence and effect gives a perspective for the context. The barriers existing within the circular economy can be divided into four main categories; cultural, regulatory, market and technological. These interrelated dimensions are important as failure within them may cause failures in the circular economy. (Kirchherr et al., 2018, pp.266-267) The barriers related to the circular economy within SME's can be in the environmental culture (Rizos et al., 2015, pp.2-3). The cultural barriers may lay with the ignorance of consumer or

company culture that is vacillating (Kirchherr et al., 2018, p.265). Financial areas, lack of support from the government or rules and regulations may also create barriers. Information availability is an important factor as well with administrative issues. Capability plays a role when lack of technical skills sets barriers. Support is important from the supply and demand networks as without them barriers occur. (Rizos et al., 2015, pp.2-6) When looking at suppliers, it might be that for example green suppliers are missing or financial support is hard or inflexible to get (Rizos et al., 2016, p.1222). Also, there are barriers related to lack of resources, such as employees and time (Rizos et al., 2015, p.8).

The existing barriers within the SME circular economy companies may relate also to economics when looking at pro-environmental behaviour. They can be structural or contextual and cultural. Also, pro-environmental mentality does not always mean acting on it. (Piispanen et al., 2019, p.467) SME's easily concentrate on their core business, thinking that being green is a plus side for their business even though there are many benefits in it like cost effectiveness. To increase the interest towards the circular economy, the model has to support the core business. (Rizos et al., 2015, p.11) It seems that for new circular economy companies the mindset is easier than for the ones that are changing their existing business methods. It also seems that the barriers are experienced differently by the SMEs depending on how they have adopted the circular economy, for example when government support is needed. (Rizos et al., 2016, pp.1223,1225)

Enablers are an important factor alongside the barriers in the circular economy. Enablers create ways around the barriers and help creating successful business. For example, a circular economy seems to be more efficient in a long run. To boost this there is training needed within the leadership and skills. (Rizos et al., 2016, p.1226)

1.3 Key concepts of the study

The main concepts for this study are the circular economy and relating to that sustainability and closed loop. Other main concepts are business opportunity recognition and opportunity itself. The study concentrates on the circular economy and business opportunity recognition. When

considering the research questions these two concepts are in a central role. In this chapter there is insight provided on both of the main concepts.

Sustainability is something that has been looked for within the industries. Especially larger companies have developed their business towards a sustainable direction. (KPMG, 2008, 2011, 2013, 2015, 2017) It is also something that is widely discussed among the companies and policymakers. Even though the issue has evoked a lot of conversation, the differences between the concepts of sustainability and circular economy are somewhat unclear. (Geissdoerfer et al., 2017, p.758) The concept origins from the forest industry (Geissdoerfer et al., 2017, p.758) and later it was included within ecology, as nature can repair itself (Duden, cited in Geissdoerfer et al., 2017, p.758). There are many conceptualizations for sustainability and within one it is seen as; "*the balanced and systemic integration of intra and intergenerational economic, social and environmental performance*" (Geissdoerfer et al., 2017, p.759).

A circular economy has several definitions. As the subject has gained a lot of attention, one universal definition is impossible to build as it would always leave something important out. Many of the instances do not define it at all and some use other definitions, but quite a few uses the definition from the Ellen MacArthur Foundation, a business development agency, that has defined the circular economy based on research (Korhonen, Nuur et al., 2018, pp.546,548). The Ellen MacArthur Foundation defines the circular economy as follows; "*circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.*" (EMF, 2013, p.8).

The concept from the Ellen MacArthur Foundation would fit this study, because it points out three principles; reduction of waste by design, extending the use of materials and promoting natural regeneration and all these factors can be spotted within the core of wood construction (EMF, 2013, p.8). However, as the studied companies do not operate intentionally within the circular economy, the attention has to be set towards another concept or at least the existing factor acknowledged.

Throughout other fields the concept of a circular economy can be contrasted to blood flow. It has also been described as the money flow in economy (Murray et al., 2017, p.372). Based on the different theories of the closed loops, the circular economy has been conceptualised as; *"a*

regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (Geissdoerfer et al., 2017, p.759).

Geissdoerfer et al., (2017, p.759) points to the cycles in their work but do not point out the natural flows when conceptualizing it and more likely concentrates on the purpose of action, highlighting the factors that are made. In the circular economy, there can be seen recycling but also biogeochemical cycles (Murray et al., 2017, p.371). These cycles are also lifted up and the biological cycles pointed out within the work of Bocken et al. (2016, pp.309,311,313) where the closed, narrowed and slowed loops are introduced. A circular economy has core components in sustainable raw material flow and already in the nineteenth century there was an idea of industrial metabolism (Murray et al., 2017, p.372). Murray et al. (2017, p.377) conceptualise circular economy as follows; "*The Circular Economy is an economic model wherein planning, resourcing, procurement, production and reprocessing are designed and managed, as both process and output, to maximize ecosystem functioning and human well-being."* These cycles are beneficial when considering the circular economy (Korhonen, Honkasalo & Seppälä, 2018, p.40). Yet here also the awareness is highlighted.

When concentrating on consumption and production, adding the holistic contribution for societal development towards sustainability, as well as taking into account the nature's cycles and the united consensus of the stakeholders, like industry, policymakers and academic world, the definition goes towards; "*CE is a sustainable development initiative with the objective of reducing the societal production-consumption systems' linear material and energy throughput flows by applying materials cycles, renewable and cascade-type energy flows to the linear system. CE promotes high value material cycles alongside more traditional recycling and develops systems approaches to the cooperation of producers, consumers and other societal actors in sustainable development work.*" (Korhonen, Nuur et al., 2018, p.547)

In this definition we are able to set also the apartment houses made of timber. Instead of taking here the consumers' point of view, we take the point of view of the SME's that are in the line of industry that is producing these high-quality products for the consumers. The end product is made for the consumers in one way or the other. This is the perspective which we are looking from with this particular industry. Also, this definition does not consider intentionally circular economy operations to be highlighted and adds the sustainable material flows in to the

construction industry. The nature's cycles are playing an important role when discussing about wood construction as the conversation turns easily to the carbon footprint and its size compared to other methods of conduction (Why wood?, 2014). Also, wooden houses function as carbon sinks (The Benefits of Wood in Building Construction, 2014). The field needs co-operation with several instances and is dependent on each other to make the field function smoothly.

There can be several constructs seen within business opportunity recognition. Ventures always require either individuals or a group (Shook et al., 2003, p.382). The study of entrepreneurship has not defined a theoretical question and therefore it lacks a grounding theory (Suddaby et al., 2015, p.1). Shook points out that once the entrepreneurial intention is clarified the search for opportunities begins (Shook et al., 2003, p.381). Casson (1982, cited in Shook et al., p.381) states that entrepreneurial opportunities or services are such that can be sold further for profit.

Schumpeter (1934, cited in Mary George et al., 2016, p.310) saw the opportunities as a new source of combinations that can be more than products or services; that they can also be new raw materials, organize the market or methods for production and their novel usage. Kirzner (1979, p.62) points out that market demand and resources need to be invented, lifting up the opportunities as imperfections in the market that create the value. The literature as such agrees that the entrepreneurial opportunities consist of value creation processes at its core. Entrepreneurial opportunities have been seen within literature as; "*positive and favorable circumstances leading to entrepreneurial action*". (Mary George et al., 2016, p.310)

Opportunity as a concept is vague and defining it has caused struggling for authors. Opportunities and the entrepreneurial nexus lose the core elements because of the nature of the concept of opportunity. Clarity is needed within its construct as the relations between constructs are unclear. The solid knowledge about the core of opportunity is minimal. Even identifying them causes problems or measuring them and their characteristics. Difficulties remain in measuring opportunities in real-life circumstances and the main characterization is faint. It seems that the difficulties with the construction of opportunity is inherent. With its form, opportunity sets obstacles when in consideration of the research that is forward-looking. This occurs when actions and outcomes are argued in early stage with the actor characteristics and the opportunities. If opportunity as a construct explains actors view of the object, then it cannot explain the reasons behind leaving the action. If the opportunity is very good objectively, then the definition does not explain neither ending the process or a possible failure when taking the opportunity in use. (Davidsson, 2015, pp.675,677,679) Basically, this means that opportunity

cannot function alone within the construction and there is something else needed to explain opportunity.

In the academic literature only some minority of papers define opportunity and those who were clarifying the construct often left it unclear. Davidsson (2015, p.675) notes that the nexus and the entrepreneurial processes where the opportunities influences are poorly presented. Often when the entrepreneurial opportunity is defined it is labelled as objects, like external conditions. Another view is to progress the issue as a social construction or an individual cognition. Also, the opportunities are described to be pre-existing or created as well as both influenced by imagined future ventures, external circumstances, imagined future states or future action paths. The definitions are reflections by different theoretical views and philosophies. If the definitions differ from paper to paper, they may handle the matter just from a different light but there has to be consistency with it. Different definitions and their absence would be acceptable if it would be consistent. This is not the case at the moment and the variation is notable, and also entrepreneurial opportunity is in use in inconsistent ways. (Davidsson, 2015, pp.675,677)

Re-conceptualisation of opportunity gives a possibility to distinct the prior concepts and add clarity for blurred lines especially between explananda and explanantia. This means external conditions and subjective perceptions as well as the actor and the entity acted upon, not forgetting the contents and the favourability of the focal entity. The blurred lines exist also between explanatory factors and those ones that are being explained. Using the three constructs; **external enablers, new venture ideas** and **opportunity confidence**, the aim here is to connect the theoretical gaps and empirical approaches in the entrepreneurial processes. (Davidsson, 2015, pp.675-676) Within this research, the opportunity is not only seen as "*positive and favorable circumstances leading to entrepreneurial action*" (Mary George et al., 2016, p.310), but also adding the three constructs, external enablers, new venture ideas and opportunity confidence, within the construction to clarify the opportunity and the nexus. (Davidsson, 2015, pp.674,676).

1.4 The structure of the thesis

The introduction presents the interest of the researcher and the general interest towards circular economy within the policymakers, but also within academic literature. Wood construction is discussed about as a context of this study, representing the field of circular economy and insights are provided shortly into business opportunity recognition. Also, it is brought up that there is not much literature about it within the circular economy.

There is introduced not only the context of this study, which is the SME's that are operating within wood construction in the Finnish markets representing the circular economy companies, but there is also provided the drivers and barriers to deepen the understanding and by providing that in this study those factors are recognised, although that is a topic for another study. Also, the main concepts are provided, which in this study means the circular economy and the related concepts like sustainability as well as closed loops. The other main concept are business opportunity recognition and opportunity construction.

After the introduction there is a theoretical background which first introduces the circular economy and its characters in contrast to the prevailing linear economy. The circular economy is discussed critically providing a multi-angled view of it. The purpose of this study is to understand the business opportunity recognition within the circular economy and therefore theoretical background continues with this objective. The venture creation and its meaning for entrepreneurship is explained. Also, there is more understanding provided about opportunity and the three characteristics inside it; external enablers, new venture ideas and opportunity confidence with the nexus (Davidsson, 2015, pp.674,676). Opportunity construct is introduced with more clarity. An important factor for this study is how opportunities are recognized in general. There are two main factors in this, and they are the discovered opportunities and the created opportunities (Davidsson, 2015, p.675). The text also presents the factors behind the capability of recognising opportunities.

In the following chapter the theoretical framework introduced, where the theory is brought together, and the research questions are united with the framework. For clarification there is Figure 1 drawn to represent the situation. The framework is a combination of Alvarez's and Barney's (2007, pp.127-135) opportunity creation and discovery, Davidsson's (2015, pp.675-676) vision of opportunity and the vision of Mary George et al. (2016, p.328) on entrepreneurial characters. Business opportunity recognition within the circular economy is viewed through this framework in the study.

The methodology outlines the main characters of this qualitative multiple case study and clarifies the interviews to be semi-structured. Also, it is pointed out that the analysis of the data is inductive content analysis, but there is theory search done beforehand so the study includes some deductive elements also. As we are studying companies within the circular economy, it is important to understand the characters of the business models and these are introduced shortly within the theoretical framework. However, this study is viewed through the ReSOLVE framework by the Ellen MacArthur Foundation (McKinsey, 2015, pp.25-26).

There is also insight provided on wood construction in general, bringing it to wood construction in Finland and explaining why wood construction is such a good field of industry for studying the circular economy. After this there is data collection and analysis presented in detail, pointing out that there are some differences when considering the circular economy and the linear economy. There were ten factors found that are connected with business opportunity recognition. When looking at how the opportunities were recognised, it was largely project-dependent whether they were created or discovered, but sometimes intertwined. Also, the interaction between the SME and the opportunity was an important factor. After the results, there is conclusion provided where also the limitations and future studies are acknowledged.

2 THEORETICAL BACKGROUND

The following theory represent the circular economy in detail and talks about its relation towards sustainability. The text discusses about the circular economy's place in today's economy, presenting also the problems that are involved with it. When in consideration of the results it is important to understand the difference between the circular and the linear economy, but also their possible co-existence and maybe even hidden characteristic within the older linear economy, like wood construction. Later the theory highlights business opportunity recognition in the linear economy and theories concerning it, pointing out the entrepreneurial characters, the role of opportunity and factors relating to its discovery. The aim is to find what are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber and clarify how SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities. The theory is highlighting the already known for the backbone of this study. Finally, there is the theoretical framework presented which collects the theory needed for answering those research questions presented.

2.1 Circular economy as an alternative for linear economy

There are a lot of similarities between sustainability and the circular economy. For example, both take a great interest in intra and intergenerational action towards the environmental issues as well as work towards integrating the non-economic factors into practice. Also, system development and innovation are core elements. Even if there are a lot of similarities, there are also differences. Some of them are related to goals, motivation and origin. (Geissdoerfer et al., 2017, pp.762,764)

Sustainability is an older concept and has a tight connection with environmental movements. Also, the goals differ with these two concepts. While the circular economy is focusing on the closed loops and inside sustainability, there are open-ended goals depending on the interest of the actor. The circular economy is also more focused on resources when sustainability considers

motivation in adaptivity and reflexivity. (Geissdoerfer et al., 2017, pp.764,758-759) Sustainability concentrates on benefitting environment, economy and society (Elkington, 1999, p.20). The circular economy is focusing on the economics and the closed-loop business activities (Rashid et al., 2013, p.173).

Recycling is a founding principle for the circular economy as it uses waste as a raw material. Companies are able to benefit from each other's waste materials and reduce waste throughout the decisions which supports the main idea of the circular economy. (Murray et al., 2017, p.371) New opportunities will rise within the business markets and this would increase employment. This has partly to do with the circularity that demands new functionalities. A positive side is also the favourable and green image that support marketing. (Korhonen, Nuur et al., 2018, p.548)

Within the circular economy, there can be seen biogeochemical cycles and recycling. Biogeochemical cycles mean the many cycles that planet has for the molecules. Businesses can take a new direction towards sustainability with a circular economy business model (Murray et al., 2017, pp.370-371). In fact, it is beneficial for the circular economy to use in advantageous those found within already existing cycles and the nature's reproductive cycles. (Korhonen, Honkasalo & Seppälä, 2018, p.40) For businesses it makes sense to keep produced value in use as long as it can be, as there are the costs for refining the raw materials and further producing from it (Korhonen, Nuur et al., 2018, p.546).

The circular economy proposes a sustainable way for doing business and promotes the reduction of waste. (Cooper, 1999, p.10). The combustion for energy should not be the first solution, it should come after the recovery of the materials for reusage and then be option for the landfill disposal. With this aim the product value chain as well as the life cycle gains the best value, not forgetting the energy efficiency that comes with this. (Korhonen, Honkasalo & Seppälä, 2018, p.38)

Businesses can decrease production costs by reusing already produced materials and avoiding new production costs. However, 100% renewable energy and recycling is not realistic as about 75% of the production of energy is from non-renewable sources extracted with combusted waste. Nevertheless, economy-nature-economy cycles can be carried out with the waste materials not limited to just pulp, timber, biomaterials, bioenergy, paper and food. This is popular for example with the cradle-to-cradle business visions as there the "biological nutrients" are released back to biosphere after utilisation of the biomass within the industry.

After realisation they continue to grow the biomass and further the biodiversity balance. Like this there is support for nature but also the resources for the business. (Korhonen, Honkasalo & Seppälä, 2018, pp.39-40)

As stated above, the three pillars of sustainability are social, economic and environment (Elkington, 1999, p.20). The circular economy does not clearly take into consideration the social pillar, which is relevant and needs attention. There is a discussion on the benefits for society but leaves in the dark how it grows social equality like social opportunity or genre equality. The ethical concepts within the social pillar are equally important with environmental issues and therefore highly relevant. (Murray et al., 2017, pp.376-377) However, on the other hand, there can be environmental and efficiency benefits acknowledged, but also social gains from the circular economy on the local and regional level that have been revealed through both indirect but also direct ways. The gains are discovered for example throughout the product life cycle, value chains, networks or from the supply chain. (Korhonen, Honkasalo & Seppälä, 2018, p.42)

2.2 Factors to consider within the circular economy

Different views are co-existing, and circularity is seen as a one archetype for a sustainable business model (Bocken et al., 2014, p.54). Overall, the theoretical connection with sustainability is somewhat unclear even though the circular economy has provided important factors for sustainability in science (Korhonen, Nuur et al., 2018, p.547). Dematerialisation and adding efficiency in operations are seen as alternative ways beside the circular economy towards sustainability (Evans et al., 2009, p.19). The circular economy also brings negative sides when sustainability is considered (Andersen, 2007, p.136). However, closed loop manufacturing can be seen sustainable when considering other manufacturing concepts, with one exception which is the ecology framework model (OECD, 2009, p.9).

Nature is all-encompassing and one part influences the other. Therefore, it has to be acknowledged that sometimes sustainable intentions may cause damage for the surroundings that is not seen beforehand. For example, in Borneo there is a cleared forest. Behind this there is the green fuel drive and need for more palm oil. (Murray et al., 2017, p.376) As a result of

this, several species of animals have lost their areas for living which has been crucial for them (Fitzherbert et al., 2008, p.3). It is also relevant to consider when the product is better to be long-lasting and when we need a product that will be easy to produce with low energy and disposed quickly from biosphere. Long-lasting products consume a lot of energy and cause entropy. These are not necessarily always the best option when considering ecology. (Murray et al., 2017, p.376)

There are not many papers highlighting the challenges towards the circular economy. Korhonen, Honkasalo & Seppälä, (2018, pp.41-45) discusses about these, representing the six challenges when it comes to environmental sustainability. The first relates to thermodynamic limits. The circular economy lifts up remanufacturing, recycling, refurbishment and reuse processes. The whole process counts and what is inside of it and therefore the "when" concerning sustainability. Important factor is to maintain, utilize and increase the cycles before recycling as the recycled raw materials only and combustion do not bring as effective results. (Korhonen, Honkasalo & Seppälä, 2018, pp.41-42)

Secondly, there are spatial and terminal system boundary limitations. The linear economy is strongly rooted, and the circular economy projects do not have global structure even though it is having a global goal. The spatial problem comes with the system boundaries; the boundaries faced with the geographic or even with the material flow, adding the possible boundaries with administration. The human influence is partly still unknown when it comes to material flows. Within the circular economy, durability is considered as a good thing. With this there might be a risk for unsustainability when considering the factors on the long term. In other words, durable products may create yet unknown risks that will occur later. This speaks for the products that has a shorter life cycle and conflicts with recycling and reusage. (Korhonen, Honkasalo & Seppälä, 2018, p.43)

The third challenge is related with the economy and the limits coming from there. The consumption is boosted with the decreased end-products' price after the increased production efficiency and recreation of the production costs. This might be beneficial for the environmental gains that are born from the result of efficiency. The society and economy are bound together. Also, the cycles are not 100% eco-friendly and therefore the ecosystem is central when discussing about sustainability. Entropy is harmful for sustainability if the economic physical scale is not in balance. All economic operations utilize energy and increase entropy as well as decrease exergy; this includes also the circular economy. Therefore, all projects -even circular

economy projects- have environmental impacts. If the consumption culture will not change then the circular economy is going to stay in its infancy and does not begin to support sustainability. (Korhonen, Honkasalo & Seppälä, 2018, p.43)

The fourth challenge for sustainability is with timing. Quite often the first product in the market gets the best place in it. This means that companies operating within the circular economy are competing with the new and old circular economy models. The breakthrough may be challenging for the circular economy companies as there is also the existing infrastructure and the stakeholders for the linear economy. The difficulty exists even if the product would be more qualified in the matter of economy, ecology and socially. This has to do with the structures that are created earlier. The circular economy is competing with already existing cultures. (Korhonen, Honkasalo & Seppälä, 2018, p.44)

The fifth challenge occurs with the strategies and management. Inter-organizational cooperation is essential among the stakeholders in the circular economy. The network system is a bigger actor than a single company. Therefore, it can be asked if waste maximisation is a sustainable action. (Korhonen, Honkasalo & Seppälä, 2018, p.44)

The sixth challenge for sustainability asks the question concerning the physical flows. It is complicated when the product is considered waste and when a by-product. Also, there is subjectivity according to cultural, temporal and spatial forms when it comes to material flow, therefore the policies and legislation is hard to be defined. (Korhonen, Honkasalo & Seppälä, 2018, pp.44-45)

It is central to think about the appropriate technology. Schumacher (1973, cited in Murray et al., 2017, p.377) has introduced that smaller scale solutions are better for the environment when compared to large scale global solutions, and therefore the smaller scale local solutions would be preferable. For the circular economy, biomimetics are seen as an important factor. It causes a need for pretending instead of being biological. As mimicking the nature works in isolation, the natural holistic needs more. Bio-participation would be an alternative for the mimicking reductionist approach. Bio-participation leads us to take our role within the biosphere and learn to adapt to it. (Murray et al., 2017, p.377)

2.3 Business opportunity recognition

Entrepreneurs are keen to exploit the opportunities to gain the value and the benefits of being the first in the market. No one remembers the one who climbed on Mount Everest the second. (Alvarez & Barney, 2007, p.124) Venture creation is the core of entrepreneurship and involves interaction with others. Within the entrepreneur's definition, the concentration is on individuals, environment and the actions for discovering the opportunities. With the cultured intention starts the opportunity search. (Shook et al., 2003, pp.379-381)

After discovering the opportunity, there must be a decision, if it is worth to act on (Shane & Venkataraman, 2000, p.222). In this there are resources needed and the entrepreneur has to cooperate with stakeholders to be able to get the demanded resources. The enterprising individual plays an important part as without the founder there is no venture. It has to be noted that the individual's characterisation plays a part in the venture creation. Individual's beliefs, demographic and psychological side seems to effect on the venture creation. (Shook et al., 2003, pp.381,394-395)

Entrepreneurial opportunities are circumstances which support and set positive ground for entrepreneurial actions (Shane et al., 2010, p.299). Opportunity recognition is influenced by many fields of study, not just with entrepreneurship. For example, one of the influencer fields is psychology. There are also two views how the opportunities exist. (Mary George et al., 2016, p.314) It has been suggested that those are discovered (Schumpeter, cited in Mary George et al., 2016, p.314), but it is also proposed that they are recognized when the surprise factor plays a part (Kirzner, 1997, p.72).

Both of the theories describe opportunity recognition within entrepreneurship but concentrates on different factors. Discovery expects that opportunities are already here and creation does not believe it (Mary George et al., 2016, p.314). The basic idea behind the entrepreneurship differs behind these two theories. Behind the discovery theory there is a view of the entrepreneur being a scientist who brings the opportunities in front of everyone's eyes. Then again, the idea behind creation theory pictures the entrepreneur as an artist and see the phenomenon behind the social constructionist lenses. (Suddaby et al., 2015, p.4) However, the entrepreneurial process is always context-dependent and the decisions are made based on the nature of the context (Alvarez & Barney, 2007, p.135).

Within the discovery theory, the nature of opportunities exists independently. The nature of entrepreneurs differs significantly from the others. Within opportunity discovery, the opportunities appear through the exogenous shock, but not all can recognize them even though they are aware of what is happening in the surroundings. These shocks might cause difficulties in the field and through them they create opportunities. When opportunities are seen as something that is just waiting to be discovered it lifts the meaning for systematic search within the environment. The discovery theory expects that the opportunities are already within nature and it makes the decision-making context risky. The data of the opportunity can be collected but it might take time. (Alvarez & Barney, 2007, pp.127-130)

When looking at the creation theory, the nature of entrepreneurs does not differ as much, but recognises small differences. The opportunities are created as there is nothing to find. Also, there is not too much room for searching. Creation theory places the entrepreneur into the centre of action where the opportunities are not found but are made and tested within the markets. Creation theory underlines the opportunity creation by action. (Alvarez & Barney, 2007, pp.130-131)

The entrepreneurial action is the ultimate source of opportunities. When opportunities are created the entrepreneurs interact with the environment. The market is a social construction bringing and lifting up the viewpoints and opinions of those individuals who are part of that environment. Entrepreneurs learn that not all of their assumptions are right and sometimes they must change their way of thinking. Creating opportunities involves information search; with this they might be able to discover opportunities, but also analyse the situation. The creation theory lifts the information collection, but all the information is impossible to collect from every angle. Possibly it does not even exist. Therefore, the amount of time and the abilities of entrepreneur influence on the decision. (Alvarez & Barney, 2007, pp.131-135)

From the factors influencing on the reasons why some recognise business opportunities and others do not can be named six; **cognition, entrepreneurial alertness, environmental conditions, prior knowledge, social capital** and **systematic search**. These factors can be found in both discovery and creation. Also, they are bonded to each other and function as an interrelated whole. (Mary George et al., 2016, p.328)

Outside of the six listed factors that effects on opportunity recognition, there are also other factors recognised. Emotions are connected with entrepreneurship in several ways, also in opportunity recognition. It influences in many ways on our behaviour and cognitions. The area

where entrepreneurs operate are such that they evoke emotions. The pressure faced in various forms brings up feelings and therefore impacts on opportunity recognition. Positive emotions effects on opportunity recognition, but also being able to act on the environment and acquisition of resources. The positive feelings may have a negative effect in case of cognitive biases. (Baron, 2008, pp.328,332,336-337) Also, Li (2011, p.277) points out the effect of feelings and the success within the business venture. It is noted that others see opportunities when others see possible failures. There are several emotions that influence on judgement according to new opportunity under uncertainty. (Li, 2011, pp.278,292).

It has been shown that genetics influence on opportunity recognition through openness to experience them (Shane et al., 2010, p.298). Also, market orientation influences on business opportunity recognition. When a company has a strong market orientation, it has more operations that generates knowledge. Understanding increases opportunity recognition as well as innovation. (Webb et al., 2011, p.549) Prior knowledge gives a lot of advantages and social network creates possibilities for grinding the old cognitive framework throughout social events (Mary George et al., 2016, p.328).

From the weak ties entrepreneurs may gain more information than from stronger ties (Kontinen & Ojala, 2011, p.493). Strong ties provide a lot of opportunities and resources (Mary George et al., 2016, p.333). Also, the amount of opportunities accumulates with strong ties (Ellis, 2011, p.113). Social capital is linked with human capital and from there gives options for the resource mobilisation (Bhagavatula et al., 2010, p.245).

Cognition and personality straits influence a great deal on our behaviour. For example, some people are more likely to take risks than others and gain more opportunities that way. (Baron, 2006, p.105) Others see opportunities when others see possible threats or failures (Li, 2011, p.277). It seems that entrepreneurs are more creative than others on average (Heinonen et al., 2011, p.661). Positivity also influences on the amount of opportunities that one meets (Baron, 2006, p.105). Cognitive processes have an impact on opportunity recognition. It seems that entrepreneurs make a mental connection when opportunities are recognised. (Grégoire et al., 2010, p.413)

Framework presented for opportunity recognition via cognition connects alertness, environment, systematic search and prior knowledge (Baron, 2006, pp.104-105). Discovering opportunities brings up a view where changes in the environment promotes opportunities. These

situations create a need for using the cognitive framework. The framework has been developed from past experiences. (Mary George et al., 2016, p.328)

Environmental changes may accelerate the discovery or creation of new opportunities throughout the change and development (Shane & Venkataraman, 2000, p.221). Entrepreneurial alertness plays its part as well. It has even been discussed that a person who is very alert may be able to discover opportunities even without an active process (Mary George et al., 2016, p.336). Systematic search is a factor that is useful for finding opportunities (Zahra et al. 2009, p.522). It links prior knowledge to venture creation and uses them together (Baron, 2006, pp.110-111).

2.4 Opportunity construction

The study of entrepreneurship is not unanimous about the theory around it. This has partly to do with the factor that the majority of the research has been done with quantitative methods. The main reason seems to relate to the fact that the outlining research question is missing from the research of entrepreneurship. In other words, the question that could consider the ultimate core problem concerning entrepreneurship from all edges has failed to form out. (Suddaby et al., 2015, p.2) The meaning of the constructs must be clear to be able to clarify the relationships among the constructs. (Davidsson, 2015, p.679).

Kuhn (1970, cited in Suddaby et al., 2015, p.1) has mentioned the missing “core puzzle”. Qualitative methods create possibilities for new theories to discover more within entrepreneurship. An arising and central issue within the research is to discover where business opportunities originate from. The interaction and relationships of actors within the key network play an important role when opportunities are concerned. Also, social-emotional strength, cohesion and trust plays a part when in consideration of the actor when forming the network. There seems to be two central origins. The first one is imprint and these are with a social and historical background. When it comes to ideas where the environment is playing a role in production, these might even slow down the process. The second is reflexivity and counterforce imprint. Here the problem-solving and analysing plays a part. The central role is to move on from the current situation and to create new. (Suddaby et al., 2015, pp.5-6)

Imprint and reflexivity can be seen as a proportion of the larger ensemble where the major question is if the opportunities are created or discovered. Imprint and reflexivity support both views. These concepts let the issue to be studied from a new perspective and consist similarities with the business opportunities when the actor recognises new approaches with a creative and novel way from the surroundings. Imprint and reflexivity can function together to explain the business models. (Suddaby et al., 2015, pp.8-9)

As mentioned, opportunities can be divided into discovered and created, but also to first-person and third-person opportunities. The source of opportunities has caught the wider attention as well as the entrepreneurial process and its nature. Opportunity construction seems to have received less attention even though the distinction between discovery and creation of opportunities have gained the attention. The opportunity itself at its fundamental form has been left out of the radar. The essential form is within the external conditions, individual cognitions and social contractions. Also, the weight is on the questions when, where and why the opportunity is apparent. (Davidsson, 2015, p.675)

When looking at the study of entrepreneurial opportunity, there are clear difficulties in clarifying it and minority of the papers consider the interaction between the actor and the opportunity. The progress for entrepreneurial opportunities in nexus perspective has been minor. Davidsson (2015) studied 210 articles and 14 of these formally introduced actor-opportunity interaction. Only two presented the nexus. There were also 22 studies found that furthered the insights on actor-opportunity nexus. (Davidsson, 2015, pp.677-679)

Only two of these papers were qualitative within Davidsson's research (2015, p.678). One of these papers promotes prior knowledge. Shane (2000, p.452) points out in his research the three factors which are prior knowledge of customer problems, prior knowledge of markets and prior knowledge to serve the markets. Everyone is not able to recognize the opportunities equally and information asymmetry can be seen as necessary for entrepreneurial opportunities. The value must be understood from the opportunity before the profit can be gained. It can be suggested that the opportunities are not discovered by search but with new information and understanding the value in it. The information is generated from the experiences and therefore it differs from person to person. Only certain individuals are able to discover opportunities with the prior understanding that they have, and this also effects on their chosen direction of the chosen path. The technological changes by themselves are not enough; the individual has to have an understanding of the matter. (Shane, 2000, pp.450-452,466)

The other qualitative research that Davidsson (2015, p.678) pointed out within his work was Corner's and Ho's (2010) research where the focus is on opportunity discovery within the social enterprise, using the broader entrepreneurial literature to understand the phenomenon within the set environment. They found opportunity development that was associating with social value creation within the entrepreneurs. The ideas were developed over time and the innovation for value creation were created at the same time than the ideas for implementation. The innovation was more complex than entrepreneurial literature was introducing. Opportunity development did not reflect two factors. The first is that the opportunities were not as clear with the identification or with the value creation factor and the second is that opportunities were not clearly created or discovered. (Corner & Ho, 2010, pp.637,643,645)

They also found four patterns. The first is the overarching pattern of opportunity development where opportunities developed and formed over time by the entrepreneur who understood the social issue. The development process was more complex than in commercial economics. The second pattern highlights the collective action within the opportunity development. The third pattern was the information sharing with collective action by multiple actors to opportunity development. The fourth pattern reveals that a moment of inspiration or insight gives a possibility for opportunity development. The spark construct is the complex part of the opportunity development. Opportunity development consists more phases than the traditional entrepreneur research proposes, and the pattern showed opportunities to be organic, fluid, actor-dependent and complex. (Corner & Ho, 2010, pp.654-656)

The core questions are missing when in consideration of the opportunities and the nexus, and the characterisations of opportunities are still faint. Also, their direct and actor-moderated influences in the new economic activities are faint as is their role in the path of economic activities between the non-existence to existence. Davidsson (2015, p.675) argues that for opportunity construct the complexity of the phenomenon is a matter of lack of empirical and theoretical development. Opportunity has a dual nature divided into contents and favourability. Process framework explaining success, action, prospective, failure and inaction does not fit with favourability. This points out the characterisation of the opportunity and lifts up the conversation of its nature of objectivity and subjectivity, setting the confrontation between them. Therefore, setting the construct is hard when considering the levels of analysis, time, space and actors. (Davidsson, 2015, pp.675-676) Even if opportunity is in a central role with this (Shane & Venkataraman, 2000, pp.220-221), the theories are not able to clarify the reasons behind it specifically and clearly (Davidsson, 2015, p.680).

From these theories this study focuses on the Davidsson's (2015) view of opportunity and the three constructs inside it when in consideration of the opportunity construct and the nexus. However, it also discusses about the creation and discovery factors. There is a wide a range of conceits of the role of the non-actor within the entrepreneurial process. The nexus is the interaction between the actors and opportunity. Here the opportunities are lifted into the key role. Within the entrepreneurial opportunity there are constructions such as; **external enablers**, which collect the circumstances generating outcomes and possibilities for venture creation. These can be the technological breakthroughs, regulatory changes or demographic shifts. **New venture ideas** are the second construction, which is the main alternative for actor under nexus view. Here the possibilities of new ventures are considered with new products and services. **Opportunity confidence** is the third construct, setting the ground for entrepreneurial activity. Opportunity confidence, external enablers and new venture ideas all promote the non-actor factor. There can be a vivid range of results when it comes to entrepreneurial actions. Therefore, the focus should be turned onto the actor, opportunity and the nexus. Actor is always stable and does not explain the results by itself. Here the actor, idea, trust and the environment play a role for the actualization and the success of the company and from this ground for new models and theories can be created. (Davidsson, 2015, pp.674-676,680,686)

2.5 The theoretical framework in this study

In this study, the literature review explains entrepreneurial opportunity recognition and the circular economy, more precisely taking the circular economy as an alternative for the linear economy and discussing about it critically. Entrepreneurship and business opportunity recognition with it are brought next to the circular economy as we are interested in understanding the way how SME's within the circular economy, specifically in the wood construction and the apartment house building with timber, recognize business opportunities. Also, the aim is to focus on the main factors for business opportunity recognition at the beginning of the company's operating years or later in the company's lifecycle as a new operating field within the circular economy.

When looking into business opportunity recognition, the entrepreneurial opportunity is divided into the three dimensions to clarify the concept; opportunity confidence, external enablers and

new venture ideas as the non-actor factor. Concerning opportunities as such there are two main groups involved with it; discovered and created. (Davidsson, 2015, pp.675,679,686) Discovered opportunities are seen as already existing but created opportunities do not exist before having been created. (Mary George et al., 2016, p.314) Discovery theory presents the opportunities to be independent. Opportunity discovery involves an exogenous shock that appears as a possibility. Creation theory puts weight on the action and proposes that the opportunities come throughout an information search. (Alvarez & Barney, 2007, pp.127-128,131,135)

After we understand the opportunities and the factors behind them, we can understand the creation process with them in entrepreneurship in general. This is where the study is concentrating on with its research questions and focusing on the circular economy rather than the linear economy. The first question is: What are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber? Then the sub-question is: How SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities?

The actor, which is the entrepreneur and in this case the SME, is in central position with the opportunity and the nexus, which is their interaction and in a central role as well within the entrepreneurial process. This highlights the opportunity. Opportunity is not the only factor as the entrepreneurial actions also play a part, but the actor is stable and needs other factors to explain the whole picture. The nexus between the opportunity and actor is important. (Davidsson, 2015, pp.674-680)

Because nexus, opportunity and actor are important, there has to be understanding on also the entrepreneur, not only the factors behind the opportunity (Davidsson, 2015, p.674). Not all recognise the opportunities while others do. This is acknowledged in both theories, discovery and creation. There are six factors that forms an interrelated whole, which has connection on opportunity recognition. These factors are; cognition, entrepreneurial alertness, environmental conditions, prior knowledge, social capital and systematic search. (Mary George et al., 2016, p.328)

The following picture defines the theoretical framework. At the top of the picture there is the entrepreneur and the six factors influencing the actor; the other factor from the nexus. In the middle there is presented the opportunity that is with the three clarifying concepts. The

opportunity is found by creation which involves action and through investigation it is revealed. The opportunity is found as it has existed already and it is realised by the exogenous shock. In this picture, there is "create" at the other side of the nexus. This framework creates the background where the research questions are studied.

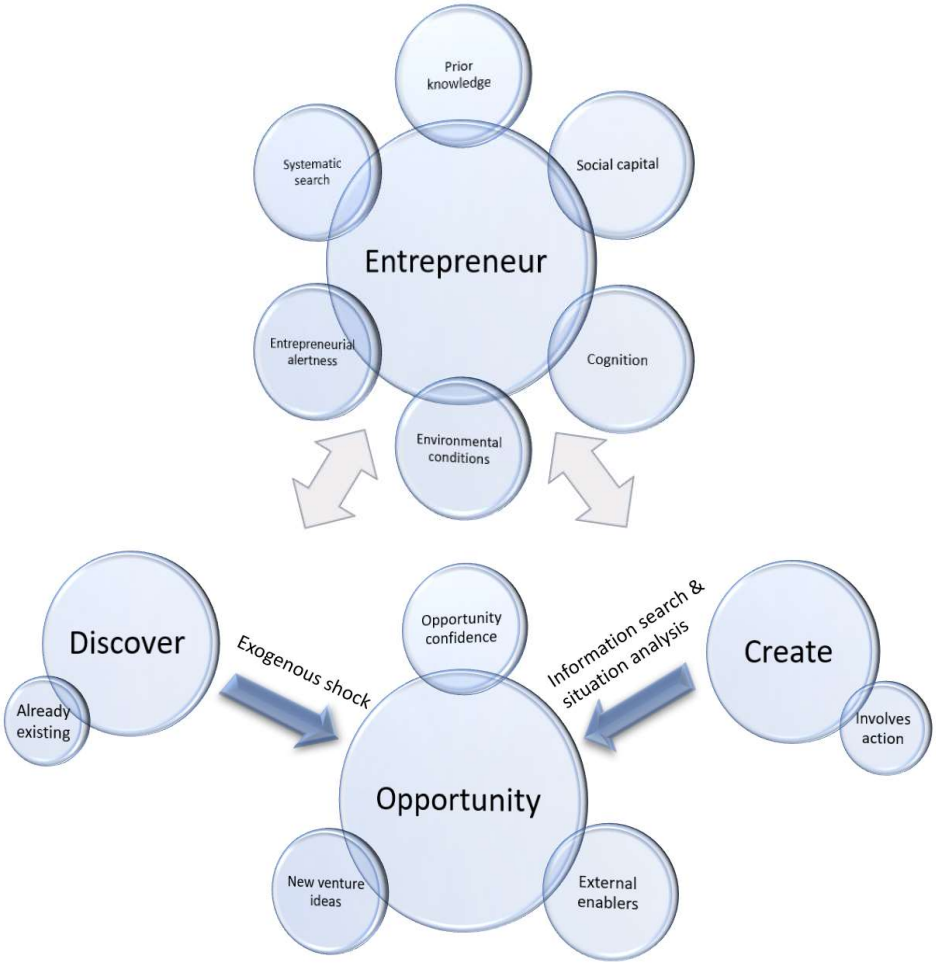


Figure 1: Theoretical framework model (Alvarez & Barney, 2007, pp.127-135; Davidsson, 2015, pp.675-676; Mary George et al., 2016, p.328)

3 METHODOLOGY

This is a qualitative multiple-case study, using semi-constructed interviews to find out what are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber and how SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities. The SME's are studied within the context of wood construction. These companies have experience with apartment house building using timber in Finland.

The field is seen as a part of the circular economy by its core element and viewed through the ReSOLVE framework by the Ellen MacArthur Foundation (McKinsey, 2015, pp.25-26), acknowledging also that there are also other ways to approach the business models within the circular economy. The data is collected from six parties with expert and organisation interviews. The data is analysed carefully with inductive content analysis, but the research has deductive elements also which are explained in detail in the following text.

3.1 Methodological approach

This multiple-case study with semi-constructed interviews focuses on the SME's within the circular economy, which in this research is chosen to be in the field of wood construction. The target is to find out the factors that are connected with SME's business opportunity recognition within the circular economy field in the beginning of the operating years or later within the lifecycle when finding new opportunities, but also understand how these opportunities are recognised.

The opportunities can be seen fundamentally as social constructs (Davidsson, 2015, p.675). When studying the social construction processes the key is understanding the factors behind the issues, not the hard figures (Gioia, 2013, p.16). By using qualitative methods, new factors can be discovered and therefore qualitative methods suit this study well, to generate information of entrepreneurial opportunity discovery within the circular economy and setting the interest on to the new promising field of construction (Suddaby et al., 2015, p.2).

The interest is to study the factors related to business opportunity recognition within the circular economy and finding if the factors are already existing or if they are created (Alvarez & Barney, 2007, p.123). There is a lot of research within the circular economy and business opportunity recognition, yet the gap lies with connecting these two. Circular economy lies within the different principles other than the linear economy (Murray et al., 2017, p.371).

The research is somewhat deductive; this means that there is a literature review conducted, studying various academic articles. It is also common to have both of these aspects within a study. It can even be questioned, if such a research can be thoroughly purely inductive. (Eriksson & Kovalainen, 2011, pp.24,125) The data analysis is inductive and within this research I am very aware of the prior studies before conducting the inductive content analysis for the interviews. We are always somewhat aware of any prior work, and it is important to acknowledge the factor. The balance with prior knowledge and new information prevents reinventing wheels again. Sometimes the prior research may be guiding too much. By acknowledging this factor, the effort is made to avoid such situations in this study. (Gioia, 2013, pp.21,23)

Based on the interesting and relevant articles, the research started with a snowball method but continued beyond that when more material was needed. With the background research there is a possibility to promote the interesting and new features concerning the study which is typical for intensive case study. Within the intensive case study, the focus is on how a specific case works. (Eriksson & Kovalainen, 2011, p.121)

Within the prior research there is also other material used, like webpages and reports as well as other relevant written material like news articles, but also some video material. Wood construction is a new field in Finland when it comes to apartment buildings and therefore the material was looked also from other resources than academic articles. Both the circular economy and wood construction has experienced a public hype and therefore it was relevant to observe the field where the actual study is conducted.

There is information provided on the selected companies on a general level and the general atmosphere that is included within the circular economy and wood construction. Also, interviews were conducted. There are several different companies studied and therefore the multiple case study is better suited for this purpose. The prior research is guiding the issues studied in this research as often in multiple case studies. (Eriksson & Kovalainen, 2011, p.125) Prior study is there also for setting the direction right and to give validity, adding quality as

well as background for my study but also for the questionnaire. It can be seen that the data structure is the anatomy of the theory and the model is the physiology of the theory (Gioia, 2013, p.24).

The interviews were semi-structured. This is also a category where most of the qualitative interviews are done when considering a business research. With semi-structured interviews there can be what and how-questions viewed. The interviews were guided beforehand with prepared topics. The method gives a possibility and freedom to be flexible with the words and order of the topics in the situation. This gives an advantage to be systematic, but the situation is informal and more conversation-like. (Eriksson & Kovalainen, 2011, pp.84-85)

In this study the interviews followed ready-made questionnaires with open questions. The question structure was modified from the questionnaire that was formed for the CICAT2025-project. (the Strategic Research Council at the Academy of Finland, 2019, decision number 320209) The questionnaire was done for the study execution by the professors of the University of Eastern Finland involved in CICAT2025. (the Strategic Research Council at the Academy of Finland, 2019, decision number 320209) The questionnaire included open-ended questions and was modified to be suitable for this study with the knowledge from the prior research. The interviews were planned to take about one hour. Using the template added validity to this study as the form was originally planned for a high quality international-wide research for an article. When the questions are considered, the interviewed should not be able to answer directly on the research questions because then the analysis cannot be done. (Eriksson & Kovalainen, 2011, p.82)

The interviews were transcribed and analysed with inductive content analysis. The inductive way of analysing the context of the interviews reveals new categories, patterns, themes, activities and makes it possible to look behind the theories and find new elements. With this method, as the analysis is proceeding, the research questions are formulated or refocused and refined. But because of intensive background research there are some deductive features in the analysing phase. (Eriksson & Kovalainen, 2011, pp.125,132)

As I did not have a clear preconception on the matter, inductive approach is suitable for the content analysis. Also, only the manifest was analysed, and the latent content was left out of this research. The transcript data was coded with open coding and categories were created. Abstraction followed this particular phase. The interviews were analysed one at a time and after

that compared. To avoid confusion, the research question was kept constantly in focus. (Elo & Kyngäs, 2008, pp.109,113)

The nature of my study is quite positive and seen in a positive light when the companies are concerned. Some companies might want to even promote their business by telling about it. (Rizos et al., 2015, p.11) I did not expect there to be any ethical issues when it comes to publishing the names of the companies.

However, right in the beginning it had to be informed that a Master's Thesis is always a public document. Therefore, the details of the interviews or the company names are not published to ensure the quality of the data. Anonymity was provided for the companies to encourage answering the questions freely. Sometimes situations that involve trust may demand special attention. These situations may occur within the business research. Anonymity protects the interviewed party from difficult situations. Anonymity should be number one on the priority list and it has to be taken care of during the whole research. (Eriksson & Kovalainen, 2011, pp.69,76) Providing anonymity not only protects the interviewed, but allows the data to be publicly reported; therefore, it is a better option than providing confidentiality. (Gioia, 2013, p.19)

Ethical issues must always be taken care of. Therefore, the references were marked with care and the work was done with transparency. Also, ethical issues with the interviews had to be taken care of by informing and explaining to all the attendees the nature of the study. Attendees had also volunteered to take a part in the study. Research ethics goes throughout conducting and reporting the research results. The fundamental part of the research ethics is that everyone and every research follows the guidelines and ethical principles. (Eriksson & Kovalainen, 2011, pp.65-66)

3.2 The context of the study – the circular economy

The fundamental idea about the circular economy is that once it is adopted it will have influence on more sustainable business with a push towards non-renewable-free production (Korhonen, Nuur et al., 2018, p.551). For sustainability, the circular economy has been considered to be necessity for the economic growth (UNEP, 2006). The circular economy is also seen inadequate

for sustainability (Nakajima, 2000, p.54). Business and policy communities see the goal for the circular economy being to alleviate the environmental issues and increase sustainability. (Korhonen, Nuur et al., 2018, p.548) The European Commission shares this vision. The circular economy is proposed to be productive with employment and resources as well as with economic growth, but possibly lacking the needed factors for sustainability (European Commission, 2014, p.8).

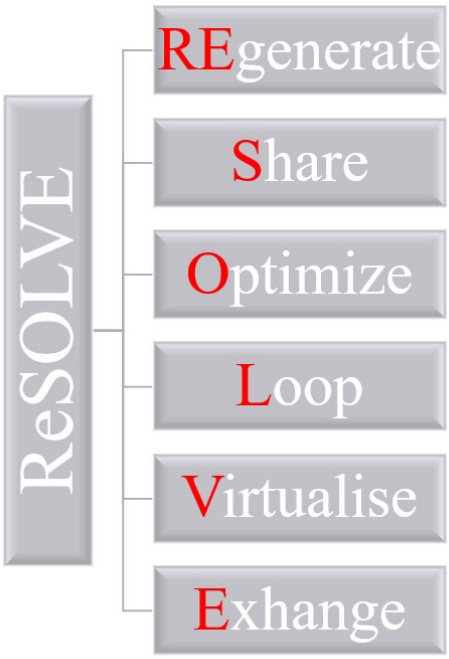
The basic idea of the material flow will create new business areas and employment opportunities, not forgetting the marketing value that comes with the green label. The new businesses may be renting and leasing the product. They may use reverse logistics and take back strategies as well as promote sharing in their concepts. The sharing economy may provide new perspectives also for the business and change the ways with travelling and accommodation by aiming to take the full capacity in use with materials. New way of consuming is in a central role in the circular economy. (Korhonen, Honkasalo & Seppälä, 2018, p.41)

For sustainable innovations there are four requirements found. Value proposition is the first one and comprehends social need, economic and ecological balance. Supply chain plays a part in the second object and consists of a sustainable supply chain management. The third points to customer interface and the choices that they make. Financial model comes in the fourth part. There the main role is with costs and benefits. (Boons & Lüdeke-Freund, 2013, pp.11-12)

Literature presents several ways to categorise a business model and there are some superimposed elements within them. Many companies function in between when it comes to the circular economy (Laubscher & Marinelli, 2014, pp.3,5-6). According to Van Renswoude at al. (2015, p.2), it can be said that there is not yet one company that is 100% circular economy business. Therefore, the main conceptual frameworks are suited also for the circular economy. It should be noted that some of them are only for the linear or the circular economy (Laubscher & Marinelli, 2014, p.3).

The framework that this study is focusing on is referred to in most of the business models developed for the circular economy (Lewandowski, 2016, p.23). Therefore, it is also chosen to guide this particular research, not forgetting that this particular framework can be set over the studied field where several different operators are involved and still be able to deal with anonymity but also with the important characteristics of the circular economy.

The **ReSOLVE** framework by the Ellen MacArthur Foundation brings out the six business action factors for the circular economy. **"Re"** for regenerate identifies that the resources are returned into the biosphere. **"S"** for sharing aims to maximize the potential of the product, but also keeping the product in use as long it qualifies under sharing. **"O"** for optimize refers to the capacity of the product and taking it into effective use. Also, it concentrates on the whole supply chain and waste exploitation. Optimisation may be united with the technological aspects, but most important is that there are no changes needed with the technology or the product. **"L"** is for loop where the aim is to reach a closed circle with the items. Inner loop is in a favourable situation. **"V"** for virtualize focus on virtual delivery instead of material and **"E"** for exchange



focuses on the replacement of materials for more permanent objects, products or technologies. (McKinsey, 2015, pp.25-26) In the following there is presented Figure 2, where the dimensions of the framework are summed.

Figure 2: The components of the ReSOLVE framework by the Ellen MacArthur Foundation (McKinsey, 2015, pp.25-26)

As mentioned, there are different business models developed for the circular economy. Even though these are not used in this study, an overview is given on some of them. First, Bocken et al., (2016) presented their own model where they presented certain factors to close and slow resource loops. They have also paid attention towards the businesses where the loops are not

totally closed. This model would have been well suited also for this study as we do not know yet if the loops will be closed in the future. The model would have suited wood construction and this study very well. However, concerning the field there are several areas where the circular economy can be found and within the field there are several different industries. Therefore, it was more suitable to view the whole field through the same lenses and use the ReSOLVE framework (McKinsey, 2015, pp.25-26).

Bocken et al., (2016) presents first four models that slow the loops and the last two strategies are closing the loops. The first model is named the **access and performance model**, where the customer need is offered so that the actual physical product is not needed to be owned. The second model is called **extending product value**, where the residual value is used for benefit. This can be done for example between the end user and manufacturer or other entities. The third model is called the **classic long-life model**, which promotes the durable long-lasting products; for example, a possibility for repair. The fourth model is **encourage sufficiency**, where the aim is to find actively better solutions for end-user to consume less. These factors can be service warrantees, durability, the encouragement of sales commissions reduction and repairability options or even upgradability. The following models five and six are the models that are closing the loops. The fifth model is called **extending resource value**, where the used waste materials are collected and a new way created to make them valuable. The sixth model is named **industrial symbiosis**; this model uses the idea of bringing value into waste and uses residual outputs from one process to produce value to another, for example in the form of a raw material. (Bocken et al., 2016, p.313).

Laubscher and Marinelli (2014) integrates the circular economy into a business model and introduces six following aspects that play a part. They also stated that the circular economy uses natural resources with more efficiency and the more efficient use creates more value, noting that the circular economy is a way to build the future instead of the linear economy for a sustainable world. The first aspect is the **sales model**; when the focus turns to the service side or leased products, the mentality is different than concentrating on product volumes. The second is the **product design and the material composition**. There the change relates to the product planning. The components, materials and overall quality has to be thought all over again when the change concentrates on usage. The third factor relates to **IT and data management**. Optimisation is important and to do this skills and competence are needed to keep things like material, products and components in order and administrated. Fourth, the **supply loops** are in the spotlight. There the own assets and recycled materials are maximised and attention paid to

the profit that the whole chain builds up value. The fifth dimension stands for the **sourcing of the operations**. This means good relationship with the stakeholders. The sixth key area lifts the importance of **human resources** and possible positive stimulus up. Training and development are needed; as cultural adaptation is required, the different capabilities and skills as well are essential. (Laubscher & Marinelli, 2014, pp.1,3-5)

Lewandowski (2016, p.2) presents a conceptual framework to support the businesses within the transition process towards the circular economy. The framework is a further developed version from Osterwalder's and Pigneur's business model canvas for the circular economy. In the following text it is presented in the same order as the factors are placed on the canvas itself. It contains eleven following dimensions and their sub-subjects; (1.) **partners** - cooperative networks and types of collaboration, (2.) **activities** - remanufacturing and recycling, technological exchange, product design, optimising performance as well as lobbying, (3.) **key resources** - virtualisation of materials, better-performing materials, retrieved resources (components, materials, products), regeneration and restoring of natural capital, (4.) **value propositions** - virtual service, PSS, incentives for customers in take-back systems and circular products, (5.) **customer relations** - social-marketing strategies and relationships with community partners in recycling 2.0, product on order and customer vote (design), (6.) **channels** - virtualisation, (7.) **take-back system** - customer relations, take-back management and channels, (8.) **customer segments** - customer types, (9.) **cost structure** - guidelines to account the costs of material flow and evaluation criteria and value of incentives for customers, (10.) **revenue streams** - performance-based, input-based, usage-based, value of retrieved resources and availability-based and (11.) **adoption factors** - PEST factors and organisational capabilities. (Lewandovski, 2016, pp.20-21)

Other models that has been developed for the circular economy are, for example, Mentink's (2014) Business Cycle Canvas. Within the circular service model, components need forming with certain areas. Mentink sets the circular economy in the same line with economic system and points the difference to be in closed material loops and introduces the Business Cycle Canvas framework. The question **what** concerns the value proposition. Reusage should play a central role and that demands reverse logistic systems. The question **how**, relates to how all the activities function. The product creation needs material recycling and that demands resources and capabilities. Taking in control the loops and acting with stakeholders as well as logistic has to function also reverse. The question **who** takes the customer and the interface under the radar. Circularity needs to be understood by the customers and that might need a change in customers

or in their buying habits. The question **why** and their revenue models set the focus on pricing by the usage. There is also consideration of the flows. (Mentink, 2014, pp.14,23,61) The flows are material, information and financial (Tukker & Tischner, 2006, p.381).

3.3 Wood construction set within the circular economy

In the following text there is presented the features involving wood construction and the arguments why the industry fits this study. It is important to understand why the wood industry fits in this study and can be introduced within the circular economy. There are some studies that focuses on wood construction and the matter of whether they are always related to the circular economy, which is the case that could be studied more in the future. In this study I do not concentrate on that factor, but the factor is acknowledged. We focus on the core element of wood construction and the benefits it offers related to the circular economy. Taking this perspective, we are able to use wood construction as a context of the study. Notable here is also that bio-participation gives an advantage to biosphere while learning to adapt to it (Murray et al., 2017, p.377). Wood construction operates very closely with the biogeochemical cycles and those are advantageous for circular economy companies (Korhonen, Honkasalo & Seppälä, 2018, p.40).

The apartments that are being built in Finland are energy-efficient, durable and fire-proof, but the wood is also used in many other purposes as well. Because of Finland's northern location, especially the wood growing in the northern part of Finland is of extremely good quality. (Why wood?, 2014) The amount of wood that is needed for a middle-sized apartment house grows in the Finnish forest in half of a minute (Puuinfo, 2014c).

Wood has been a traditional building material which has mainly stopped when it comes to big buildings. Timber itself is a renewable and natural material source. Partly because of the fear of fire, timber has yielded in front of other materials. The safety issues and engineering has developed and the material is not an obstacle anymore and also high buildings can be built. When it comes to fire, trees char while protecting their core. This is taken into consideration within the construction also and means that the structure lasts sometimes four hours of fire. (A Sustainable Timber Skyline: The Future of Design, 2017)

The material that can be disposed with fire is also a fire safety element and with the beforementioned charring quality the hold of the structures can be estimated carefully. The

crucial information that the charring proceeds at a rate of 1mm per minute gives beneficial knowledge for the rescuers and the fire departments also. With special techniques within the construction there can be 30-, 60-, 90- and 120-minutes fire durability achieved. Also, there are springers within the buildings. (Puuinfo, 2014d)

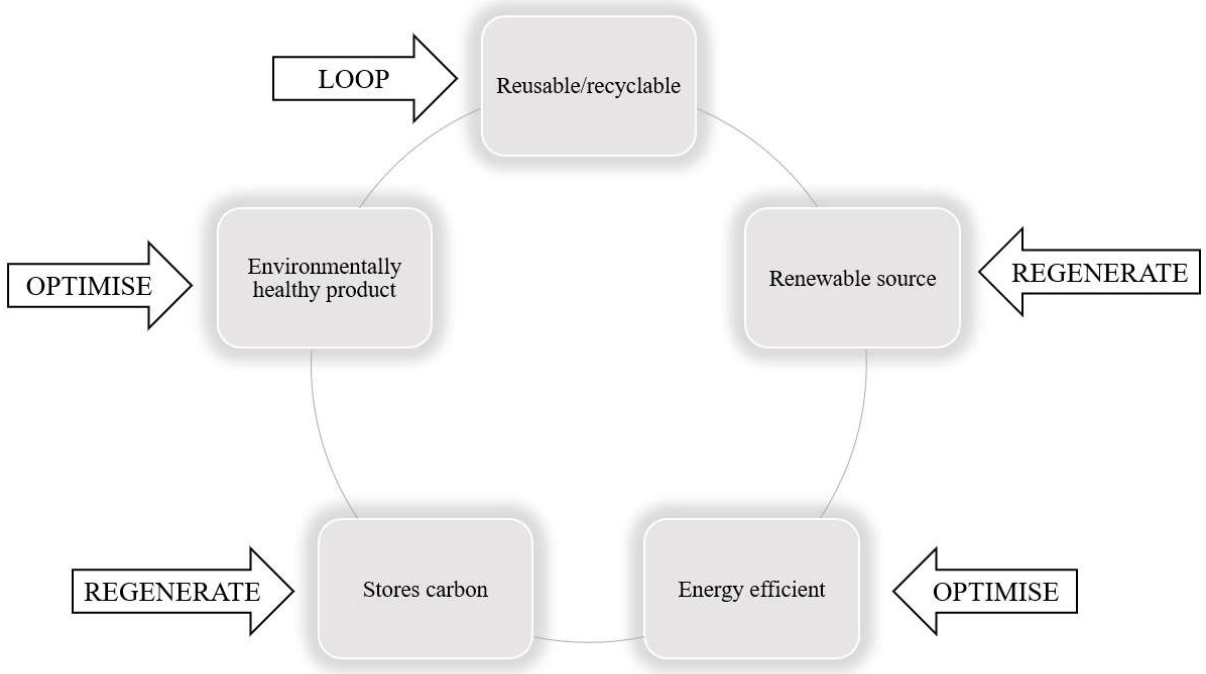
Wood stores carbon and usually the wood that is used is less than 25,4 centimetres wide. This leaves out the oldest trees and then again, the youngest trees are the ones that stores the most carbon. (A Sustainable Timber Skyline: The Future of Design, 2017) A growing forest functions as a better carbon sink than a forest in its mature age (Puuinfo, 2014b). A house with a wooden frame may store about 30 tons of carbon (The Benefits of Wood in Building Construction, 2014). That amount of carbon equals the carbon dioxide emission of an average consumer driving for 10 years (Puuinfo, 2014e). A wooden house reaches the same carbon footprint in about 30 years than a concrete house straight after it is built (Why wood?, 2014).

In a best-case scenario, carbon is stored within the house for hundreds of years. When wood is used, instead of the products that produce more carbon dioxide through their production cycle, the emissions can be minimised. Wooden products produce carbon dioxide a lot less than other heavier materials. Also, when wood is burned it releases quite the same amount of carbon dioxide than it has stored. (Puuinfo, 2014e) When preparing the wooden elements for construction, sometimes the energy production is more than the usage. The additional energy comes from side products such as bark. In the end of the life cycle, wood can be recycled or changed into energy and it is renewable energy. (Puuinfo, 2014f)

Wood construction makes it possible to prepare the elements inside a factory in advance and then transport them to the construction site ready to install, and the material is renewable and has a structural form. (A Sustainable Timber Skyline: The Future of Design, 2017) Because of the developed techniques, wood can be used in several different way on various kind of buildings (Puuinfo, 2014g). Also, when considering the whole building process, it can be said that wood construction reduces the greenhouse gas emissions. This is when the focus is on the building process and the indirect effects. Wood can be used as a replacement for many other products and as the other products can be replaced there will be less harmful materials to produce. (Puuinfo, 2014h)

When in consideration of weight, wood weights 80% less than concrete. This impacts on several things like fuel and logistics, but also safety. When it comes to seismic safety in the countries where earthquakes are a concern, it improves that, as there is less weight at the top of the

building. Also, wood gives the building a possibility to yield. This means that in case of earthquakes it is more likely to keep its structure, when concrete breaks. Energy efficiency with wood construction means that the material does not transform heat or cold in the same way than concrete. The wood core saves the energy in itself. (A Sustainable Timber Skyline: The Future



of Design, 2017) Also, the more there is wood used in the building, the less energy is needed within the whole life cycle of the building, but also its carbon footprint is smaller. (Puuinfo, 2014h) Beneath there is figure 3 provided that simplifies the factors in wood construction that directly supports the circular economy.

Figure 3: The factors within the wood construction that supports the elements of circular economy. (A Sustainable Timber Skyline: The Future of Design, 2017; Puuinfo, 2014c; McKinsey, 2015, pp.25-26)

When wood construction was studied by Franzini et al. (2018) in Finland and municipal civil servants interviewed, there has been benefits recognised which relates to the issues mentioned above like sustainable development, climate and environment. The business innovativeness has been promoted and lifted up to support the local industries and support towards the national forest sector. Branding and marketing opportunities as well as construction opportunities are recognised. Price competitiveness is understood with prolonged building lifespan. Improved

built, housing quality standards and living environment, ease of construction and renovation, not forgetting the novel and flexible design has been brought up as benefits for wood construction. There has also been general interest towards the wood construction material, but the notations towards the ecological factor when wood is considered was brief in the study. This may be contributed to the issue being too self-evident. (Franzini et al., 2018, pp.159,163)

The barriers were placed within the financial uncertainty and lack of design, planner experience, and even general knowledge as well as cost level was seen challenging. Wood industry was seen to be stagnant. The information, policies and regulations were seen as an issue and the marketing or branding value were not considered as important factors. There were concerns on limitations in material, building lifecycles, safety, project communication and planning as well as lack in municipalities' support. The end user expectations were seen limited and there was expected to be apathy. Also, the general interest was experienced to be limited. (Franzini et al., 2018, p.163)

3.4 Data collection

The project of data collection started a prior research before the actual data collection. The data collection provides a perspective for the future study and is used especially in multiple case studies. (Eriksson & Kovalainen, 2011, p.125) The prior data collection started from seven carefully selected academic articles. From the seven academic articles the core article selection spread to ten articles where the purpose was to continue with a snowball method. On the way, interesting and relevant issues were aroused, and due to that reason, the snowball method was not enough anymore.

A further look into the subject with a wider scope was needed. This happened mainly with two following topics and with some singular academic articles outside of the snowballing radar. The snowballing started with the main subjects, business opportunity recognition and the circular economy, but spread to topics like circular economy business models and barriers and enabler within the circular economy. These two topics were relevant to clarify the studied platform. Introducing the main barriers and enables gave insight into the issues that this study

was dealing with and introducing the circular economy business models were necessary when introducing the context of the study.

First Seven Key Academic Articles	Ranking
Circular Economy:	
Geissdoerfer, M., Savaget, P., Bocken, N. and Hultink, E.J. (2017) The Circular Economy - A new sustainability paradigm? *Journal of Cleaner Production*, Vol. 143, pp.757-768.	2-Leading
Murray, A., Skene, K. and Haynes, K. (2017) The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, Vol. 140, pp.369–380.	2-Leading
Business Opportunity Recognition:	
Alvarez, S. and Barney, J. (2007) Discovery and creation: alternative theories of entrepreneurial action. *Organizações em contexto*, Vol. 3, no. 6, pp.123-152.	N/A
Davidsson, P. (2015) Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization. *Journal of Business Venturing*, Vol. 30, pp.674-695.	3-Top
George, N., Parida, V., Lahti, T. and Wincent, J. (2016) A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors. *International Entrepreneurship and Management Journal*, vol. 12, issue 2, No 1, pp.309-350.	1-Basic
Shook, C., Priem, R. and McGee, J. (2003) Venture Creation and the Enterprising Individual: A Review and Synthesis. *Journal of Management*, Vol. 29(3), pp.379–399.	3-Top
Suddaby, R., Bruton, G., Si, S. (2015) Entrepreneurship through a qualitative lens: Insights on the construction and/or discovery of entrepreneurial opportunity. *Journal of Business Venturing*, Vol. 30, pp.1-10.	3-Top
Added (Key) Articles Outside of the First Snowballing Round	
Elo, S. and Kyngäs, H. (2008) The qualitative content analysis process. *Journal of Advanced Nursing*, Vol.62(1), pp.107-115.	3-Top
Franzini, F., Toivonen, R. and Toppinen, A. (2018) Why Not Wood? Benefits and Barriers of Wood as a Multistory Construction Material: Perceptions of Municipal Civil Servants from Finland. *Buildings*, Vol.8(11), pp.159-174.	1-Basic
Gioia, D. A. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods*, Vol.16(1), pp. 15-31	3-Top
Kirchherr, J., Piscicellia, L., Boura, R., Kostense-Smitb, E., Mullerb, J., Huibrechtse-Truijensb, A. and Hekkerta, M. (2018) Barriers to the Circular Economy: Evidence From the European Union (EU), *Ecological Economics*, Vol. 150, pp.264–272.	2-Leading
Korhonen, J., Honkasalo, A. and Seppälä, J. (2018) Circular Economy: The Concept and its Limitations. *Ecological Economics*, Vol. 143, pp.37–46.	2-Leading
Korhonen, J., Nuur, C., Feldmann, A., Seyoum, E.B. (2018) Circular economy as an essentially contested concept. *Journal of Cleaner Production*, Vol. 175, pp.544-552.	2-Leading
Lewandowski, M. (2016) Designing the Business Models for Circular Economy—Towards the Conceptual Framework. *Sustainability*, Vol. 8(1), pp.43-71	1-Basic
Piispanen, V.-V., Aromaa, E., Henttonen, K. (2019) A Case Study of Exploring the Barriers of Pro-Environmental Behaviour. *International Journal of Entrepreneurship and Innovation Management*, Vol. 23(5), pp.466-478	1-Basic
Rizos, V., Behrens, A., van der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., Flamos, A., Rinaldi, R., Papadelis, S., Hirschnitz-Garbers, M. and Topi, C. (2016) Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers. *Sustainability*, Vol.8(11), pp.1212-1230.	1-Basic

Figure 4: Material Chart – Pointing out the key academic articles used with Ranking (Publication Forum, 2019)

The prior research included also some non-academic material like reports that were relevant to the issue. The background research was done studying the webpages of the companies involved in the study and even with some brochures handed out by the companies. The industry was also studied from the material found on the internet, like news articles, relevant and official videos as well as through relevant webpages from the industry. Also, I attended a workshop related to CICAT2025, getting familiar with the catalysts for the circular economy within construction. (CICAT2025 & Rakennusteollisuus RT Ry, 2019) From there the clarity for the field was

gathered, but not directly used as a source for this study. For the background research the material was selected only if it was academic or official and relevant to the study, for ensuring the quality of the data. The aim with non-academic material was to clarify the visibility in to the wood construction field.

The background research was overlapping with the interviews. The interviewed companies were studied carefully before sending the invitations. The focus of the study was tightly set due to the factor that the comparison of the companies would be possible, but throughout the research the scope had to be made broader. The background research clarified very soon that the wood construction concerning apartment buildings is still developing and quite niche. Therefore, the focus from the construction moved towards the operators that are tightly involved with wood construction with apartment buildings or has experience from that kind of projects. The plan was to interview separate organisations and their CEOs or the entrepreneur him/herself. However, the idea had to be developed further.

As the research project went further and the possibilities started to show, there were interesting settings which this research tried to aim. Maxwell (2013) introduces five interrelated components within the qualitative research and these components are in constant movement with each other. The components are goal, conceptual framework, research question(s), methods and validity. Because of this factor and the prior search, the components within the study evolved to their final form. (Maxwell, 2013, pp.287-318,357)

The research setting formed within the possibilities and interest. The first aim was the maximum five-years-old constructors within Finnish wood construction. The second plan was to widen the scope and take other operators within the wood construction field that has first-hand experience with a wood construction project. There was going to be snowball method used with the requirement, meaning that one person would have introduced the next one (Eriksson & Kovalainen, 2011, p.186). The interest had evolved to aim for the possibility to collect a visibility into the construction project so that the interviews would be from the companies and their partners for understanding the project in depth within the developing field and the circular economy. Here the study started to get forms of an intensive case study, as the progress went momentarily towards that direction (Eriksson & Kovalainen, 2011, p.121). However, the setting lived and had to be reformed once again.

The final setting was expert and company interviews from the wood construction field in Finland. The interviewed parties were carefully selected and had experience in and views on

apartment construction in Finland. The field is small, as mentioned, and therefore there is anonymity provided and more details of the companies that took part in this research are not expressed to avoid any possible recognition. Anonymity lifts the pressure away from the interviewed and the conversation may be more relaxed (Eriksson & Kovalainen, 2011, pp.69,76). Confidentiality was not promised as it may prevent bringing up the results of the study (Gioia, 2013, p.19).

The plan was to conduct the six semi-structured interviews at the company sites meeting the interviewed. Because of time schedules, logistics and acting within the spirit of this study, as we understand that travelling has also a carbon footprint, in the end there were only 3 interviews out of 6 placed at the company sites or in face-to-face settings which were able to be organised between the schedules somewhere else. Face-to-face interviews were the more preferable option. Other possibilities were Skype or equivalent method or phone interview. From 6 interviews 3 ended up being through the phone. All the interviewed were CEOs, but not all were entrepreneurs. Here it has to be acknowledged that entrepreneurs and managers differ with their opportunity recognition (Shook et al., 2003, p.387). The interviews were recorded with their permission. The interviews lasted various times from 28 minutes to 104 minutes which had to do with the length of the answers and the point of view of the operator. Below is a list of the interviews, organised by the interview date, in Figure 5.

Interview Details						
No.	I1	I2	I3	I4	I5	I6
Date	27 Aug 2019	28 Aug 2019	6 Sep 2019	23 Sep 2019	4 Oct 2019	4 Oct 2019
Time	50 min	28 min	53 min	42 min	33 min	104 min

Figure 5: Interview Details

Before conducting the interviews there were invitations sent first and then the companies were contacted via phone and email, with some exceptions when the contact was made first with a phone call. The invitations were sent straight to the CEO's as they were going to be the interviewed. There was also another reason for this; the CEO's were the ones who were able to grant the company to take part in the study. As I did not know the companies, I wanted to be sure that the companies knew the nature of the study as it is important. The interviews were based on the questions that guided them. (Eriksson & Kovalainen, 2011, pp.56,84-85)

The questions were formed from the questionnaire that was formed by the professor from the University of Eastern Finland and this factor gave validity to my interviews. This has to do with the fact that forming the question got a sharpened attention and gained more experience through that co-operation. (Eriksson & Kovalainen, 2011, p.205) As the study was conducted in co-operation with the CICAT2025-project through The University of Eastern Finland, I believe that this increased visibility. (the Strategic Research Council at the Academy of Finland, 2019, decision number 320209)

As the interviews were semi-structured, they followed the questions, but were informal and conversation-like. The style of the interview gave me the possibility to go back to the questions and clarify some parts. (Eriksson & Kovalainen, 2011, pp.84-85) Some questions were left unasked. This was only if the question was not evidently relevant. For example, an expert could not answer on the question who made the decisions in a particular problem. As an interviewer, I had to be careful that my prior knowledge did not interfere with the interviews (Gioia, 2013, pp.21,23). At the same time, the prior knowledge gave me a possibility to ask further questions (Eriksson & Kovalainen, 2011, p.125).

At the beginning of the interview I presented the ReSOLVE framework by the Ellen MacArthur Foundation (McKinsey, 2015, pp.25-26). Later on, during the interview, we discussed it with the interviewed and located together where the company would fit within the framework. Here I had to be extremely careful that I did not guide the situation as the framework was new to the participating CEOs. On the other hand, all the companies were not circular economy companies, but they fit within the study scope as wood construction as such was looked as a suitable platform for the study. Therefore, I had to explain and follow closely the parts where factors of the framework were clarified, being involved with their recognition phase as well. Acknowledging this is an important factor when analysing the data. However, the interviews were done in co-operation and good spirit valuing the research ethics. The participation was voluntary, and the situation was created as transparent as possible. (Eriksson & Kovalainen, 2011, pp.65-66)

3.5 Analysis of the data

The interviews were recorded and the transcription took palace a day after the interviews. While transcribing, the manifest was captured but not the latent content (Elo & Kyngäs, 2008, p.109). I had had some difficulties while recording. There were some words that could not be heard from the tape and some that I had misheard while transcribing. While reading the transcripts I noticed some of the obvious mistakes, but could not hear some of the words that were not in the transcriptions. After transcription I read the papers again with the recording and was able to catch some of the difficult words but not all. Luckily those were not relevant when considering the content.

Next phase was coding the text (Elo & Kyngäs, 2008, p.109). I started coding after I had four interviews done and those were transcribed. Two I coded later and therefore the interview process and analysis phase were overlapping. This also affected on my tier work. In qualitative research five sections can be found and they all are connected (Maxwell, 2013, p.287). Therefore, the whole picture has to be constantly kept in mind. In the following Figure 6 the coding process is presented.

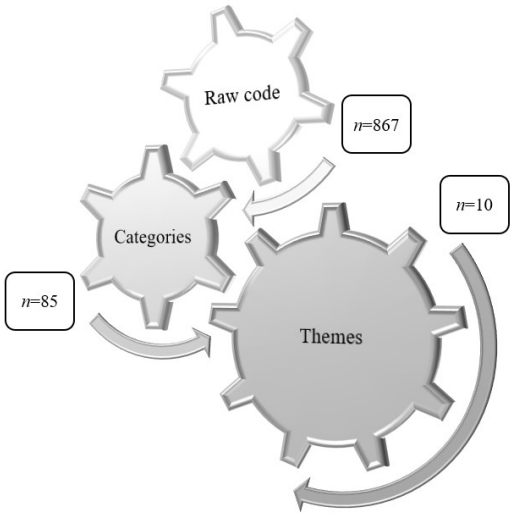


Figure 6: Coding process

Yet, I did not have a clear vision from my findings as I used inductive content analysis. In inductive content analysis the following phase is to organise the data after it is available. Thought the open coding, category creation and theme formation the inductive content analysis start to formulate the material. (Elo & Kyngäs, 2008, p.109) The analysis started with open

coding and keeping the research questions in mind. Since the material was very familiar to me, I did not have to read the material too many times over and over again.

I moved my open codes to an Excel sheet and started to list them. I went through them one interview at a time. Then I had to start to organise these raw codes into categories. I already had a vision, but after moving towards themes I realised that I had to go back to my categories. I had gone lost in my data, which is quite common in some point (Gioia, 2013, p.20). Also, I marked some of my raw codes and left them out from the categorisation phase as they did not answer questions concerning business opportunity recognition. This was because those codes were from the interviewed who were managers but not entrepreneurs. These codes could not inform about the venture creation as there is a difference how entrepreneurs recognise the opportunities compared to managers (Shook et al., 2003, p.387).

I had noticed that I had left my categories too lose and in fact my themes were closer to being better categories. After I realised this, I continued the chosen path. In the middle of the process I decided to start to change the labels in some of my themes as they reminded so much of the ones which appear in the theory. Here the empirical findings lead to the theoretical propositions (Eriksson & Kovalainen, 2011, p.25). These were cognition, entrepreneurial alertness, environmental conditions, prior knowledge, social capital and systematic search. These are the six factors that function as interrelated whole when discovering opportunities, as stated in the previous literature (Mary George et al., 2016, p.328).

The change in my categorisation made it easier to analyse the data later on. At the same time, it gave some deductive features for my analysis, as in deductive content analysis there is a prepared matrix into which the data is organised (Elo & Kyngäs, 2008, p.111). As the same labels were used in the previous studies, the priority and focus were kept in creating new labels. Here the prior research also helped me not to re-invent something that is already discovered while keeping in mind that the prior knowledge did not guide too much. (Gioia, 2013, pp.21,23)

In my questions set, there were 19 questions and they were divided into three parts. First sector concentrated on the entrepreneurship, the second focused on the circular economy and the third one was centred on the business idea itself. Also, challenges were asked and after the questions there was an open conversation part in the interviews which was also coded. There the interviewed were able to bring up issues freely. The original questionnaire was in Finnish, but translated version in English is provided in the appendix.

I had perfect visibility of the data as it all was gathered on the same Excel sheet. This way it was quite easy for me to move the data around with a pivot table and dive into it. Once I had all my themes in the right places, I collected the united category-theme pairs in to so called queues under the question titles. With these vertical category-theme pairs I was able to gather and separate the questions. As the questionnaire was a holistic view of the entrepreneurial process taking into consideration the circular economy, I did not want to separate too much. However, I did want to see the effect of the challenge and therefore I looked into the findings with and without the challenges. I repeated this also with questions related to sustainability.

With categories and themes ready, I had in total 85 categories which was a lot. Surely with some parts the categories could have been still tightened, but I chose not to do so because it would have faded the visibility into the meaning of the words. Therefore, I tried not to make the categories too tight to let the depth of the factors show, while considering the epistemology and its complicated relationship with possible truth. (Eriksson & Kovalainen, 2011, pp.17,295). In my work I tried to be as objective as possible, but coding it always leaves room for subjective interpretations and that has to be acknowledged. In the following text the ten main factors are described and analysed. There is also Figure 7 provided, where the ten main themes are listed from the biggest to the smallest.

Themes
Environmental Conditions
Social Capital
Challenges
Sustainability
Prior Knowledge
Systematic Search
Cognition
Entrepreneurial Alertness
No Prior Knowledge
Emotions

Figure 7: Main themes from biggest to smallest

Environmental Conditions, Social Capital, Prior Knowledge, Systematic Search, Cognition and Entrepreneurial Alertness were found in my research but can also be found from the prior literature as well. For making a clear distinction, the themes found in this study are written in capitals, and the six categories particularly mentioned here from the previous literature are

written in minuscule, respecting also their original style. (Mary George et al., 2016, p.328) The theme Emotion was visible in the findings and also mentioned in the previous studies, for example lifted up into the conversation by Baron (2008, p.329), Li (2011, p.292) and acknowledged by Mary George et al. (2016, p.328). Challenges, Sustainability and No Prior Knowledge were the other themes found. Figure 8 represents all the categories and themes with all the questions.

If the negative questions (questions 6 and 16) were moved out of the data, the number of themes was still the same, but categories go down to 81. When considering only the questions which were about the challenges, there were 23 categories found. This means that some of the issues were considered both positive and negative. One of the examples could be the regulations. When focusing only on the questions considering challenges, we can find that categories go down to seven. The missing categories are No Prior Knowledge, Emotions and Sustainability. Following Figure 9 represents the categories and themes when the challenge-questions are not present and Figure 10 represents the situation when only the questions about the challenges were presented. If challenge-questions 6 and 16 are removed from the results as well as the theme challenge, we get 77 categories and 9 themes.

Themes & Categories from All the Data	Count
Environmental Conditions	298
Development	53
Economics	33
Markets	29
Regulations	23
Politics	16
Benefits	14
Image	12
Important Factor	12
Growth	11
Safety	11
Standardisation	10
References	8
Facilities	8
Values	7
Shared Interest	6
Competitive Tendering	5
Finance	5
Media	5
Authorities	4
Possibilities	3
Protection	3
Demand	3
Equipment	3
Lobbying	3
Quality	2
Global Market Trends	2
Logistics	2
Project Dependent	2
Decreasing Costs	1
Weak	1
Availability	1
Social capital	142
Partners	24
Co-operation	22
Planners	13
Manufacturers	12
Trusted Network	11
Consultants	9
Owners	7
Public Operators	7
Contractor	6
Providers	6
Experts	5
Constructor	4
Investors	3
Management	3
In-house Operations	2
Customers	2
The board	2
Goodwill	1
Wood Industry	1
Architect	1
Bank	1
Challenges	131
Lack of Experience	94
Expenses Are Higher With Apartment Buildings in Wood Construction	24
Louder than Concrete Buildings	8
Unclear Regulations	3
Optimise Reverse	2
Sustainability	118
Optimise-Remove Waste	40
Responsibility	18
Regenerate-Retain	14
Regenerate-Shift To Renewable Materials	11
Sustainable Solutions	10
Loop-Recycling	9
Share-Share Assets	6
Optimise-Increase Performance	4
Virtualise-Dematerialise Directly	3
Regenerate-Reclaim	2
Virtualise-Dematerialize Indirectly	1
Prior Knowledge	73
Experience	56
Born in It	12
Active	5
Systematic Search	41
Search	37
Set Goals	4
Cognition	35
Authority	13
Willpower	9
Interest	7
Independent Decision	3
Leap of Fate	2
Naturality	1
Entrepreneurial Alertness	14
Insight	8
Future Vision	5
Discovery	1
No Prior Knowledge	9
New Field	9
Emotions	6
Passion	5
Affection	1
Grand Total	**867**

Figure 8: Themes and Categories of all the interview data

Themes & Categories from All the Data Except Questions 6 & 16	Count
Environmental Conditions	252
Development	52
Economics	31
Markets	23
Politics	15
Benefits	14
Important Factor	12
Growth	11
Safety	10
Facilities	8
References	8
Regulations	7
Values	7
Shared Interest	6
Competitive Tendering	5
Finance	5
Media	5
Authorities	4
Image	4
Demand	3
Protection	3
Standardisation	3
Possibilities	3
Equipment	3
Lobbying	3
Logistics	2
Project Dependent	2
Quality	2
Decreasing Costs	1
Social Capital	136
Partners	23
Co-operation	19
Planners	13
Manufacturers	11
Trusted Network	11
Consultants	9
Owners	7
Public Operators	7
Contractor	6
Providers	6
Experts	5
Constructor	4
Management	3
Investors	3
In-house Operations	2
The Board	2
Goodwill	1
Architect	1
Wood Industry	1
Customers	1
Bank	1
Sustainability	118
Optimise-Remove Waste	40
Responsibility	18
Regenerate-Retain	14
Regenerate-Shift to Renewable Materials	11
Sustainable Solutions	10
Loop-Recycling	9
Share-Share Assets	6
Optimise-Increase Performance	4
Virtualise-Dematerialise Directly	3
Regenerate-Reclaim	2
Virtualise-Dematerialize Indirectly	1
Prior Knowledge	71
Experience	54
Born in It	12
Active	5
Challenges	67
Lack of Experience	51
Expenses Are Higher With Apartment Buildings in Wood Construction	12
Optimise Reverse	2
Louder than Concrete Buildings	2
Systematic Search	40
Search	36
Set Goals	4
Cognition	34
Authority	13
Willpower	9
Interest	6
Independent Decision	3
Leap of Fate	2
Naturality	1
Entrepreneurial Alertness	11
Insight	8
Future Vision	2
Discovery	1
No Prior Knowledge	9
New Field	9
Emotions	6
Passion	5
Affection	1
Grand Total	**744**

Figure 9: Themes & Categories from all the data except questions 6 & 16

Themes & Categories from Questions 6 & 16	Count
Challenges	64
Lack of Experience	43
Expenses Are Higher with Apartment Buildings in Wood Construction	12
Louder than Concrete Buildings	6
Unclear Regulations	3
Environmental Conditions	46
Regulations	16
Image	8
Standardisation	7
Markets	6
Global Market Trends	2
Economics	2
Availability	1
Politics	1
Weak	1
Development	1
Safety	1
Social Capital	6
Co-operation	3
Manufacturers	1
Partners	1
Customers	1
Entrepreneurial Alertness	3
Future Vision	3
Prior Knowledge	2
Experience	2
Systematic Search	1
Search	1
Cognition	1
Interest	1
Grand Total	**123**

Figure 10: Themes & Categories from questions 6 & 16 which relate to challenges

This study concentrates on the factors in business opportunity recognition with the research question and the sub-question: **What are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber, and how SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities?** One factor that is highly relevant is that the focus is not only on SME's, but also within the circular economy. The section two in my questions concentrates on this issue. By also removing the questions of this section, I wanted to see if there is still the theme Sustainability visible. Notion here is that the companies did not carry the

label circular economy, but the core element speaks for it. When there was all the data except the section two, the number of themes was still ten. The following Figure 11 presents the details without the questions on the circular economy.

Themes & Categories from All the Data Except Questions 4, 5, 6 & 7	Count
Environmental Conditions	210
Development	33
Economics	28
Markets	23
Politics	15
Benefits	14
Regulations	11
Standardisation	10
Image	10
References	8
Important Factor	7
Shared Interest	6
Finance	5
Competitive Tendering	5
Media	5
Facilities	5
Authorities	4
Values	3
Demand	3
Safety	3
Protection	3
Lobbying	3
Project Dependent	2
Quality	2
Growth	2
Social Capital	133
Partners	24
Co-operation	19
Manufacturers	11
Trusted Network	11
Consultants	9
Planners	8
Owners	7
Public Operators	7
Contractor	6
Providers	6
Experts	5
Constructor	4
Management	3
Investors	3
In-house Operations	2
The Board	2
Customers	2
Architect	1
Goodwill	1
Wood Industry	1
Bank	1
Challenges	66
Lack of Experience	60
Expenses Are Higher with Apartment Buildings in Wood Construction	6
Prior Knowledge	58
Experience	41
Born in It	12
Active	5
Systematic Search	41
Search	37
Set Goals	4
Cognition	35
Authority	13
Willpower	9
Interest	7
Independent Decision	3
Leap of Fate	2
Naturality	1
Entrepreneurial Alertness	11
Insight	8
Future Vision	2
Discovery	1
No Prior Knowledge	9
New Field	9
Emotions	6
Passion	5
Affection	1
Sustainability	6
Optimise-Remove Waste	3
Responsibility	2
Loop-Recycling	1
Grand Total	**575**

Figure 11: Themes & Categories from all the data except questions 4-7 relating to the circular economy

When considering this or any other qualitative study we have to acknowledge that concepts used springs from quantitative research, but the connotations differs. It is worthy to point out that in qualitative study the quality does not come from the number of studied items but the insights gathered from the material. The transparency plays a great role here to demonstrate trustworthiness. The whole process counts from the interviewed and the interviews themselves, but also the logic used within the research. Validity, reliability and generalizability form a framework. Validity in qualitative research means reported factors are right. Analytic induction and reflexivity justify the matter of validity. To show validity, the member check, analytic induction and triangulation are needed. (Eriksson & Kovalainen, 2011, pp.291-292)

Member check is a way to double-check your interpretations of the interviewed parties and mirror them (Eriksson & Kovalainen, 2011, p.293) In my study, these kinds of features can be found when I have asked clarified questions or clarifications to the questions. Also, the questions were overlapping so the same answers were popping up. However, tapes, transcriptions, coding or even unpublished work were not delivered back to the interviewed parties. The data was refined with inductive content analysis and the work was produced after analysing the data.

Analytic induction combines coding and data analysis. In the analysis the theory is introduced also (Glaser & Strauss, 1967, cited in Eriksson & Kovalainen, 2011, p.293). This method is highlighted when considering my study and the validity of it. I have carefully coded the data and been thorough when handling as well as analysing it. I have explained in detail how I have conducted my research and walked the theory alongside. Triangulation refines and clarifies the research from several different directions. In my research I have used several points of views of previous literature to secure my research validity. (Eriksson & Kovalainen, 2011, pp.4-5)

Reliability tells your measured accuracy. In qualitative research the matter of reliability is unclear when in consideration of interviews or even observations. (Eriksson & Kovalainen, 2011, pp.292-293) Even though this is the case in my research, I tried to focus on the matter that I have the right interviewed and my questions accumulate answers to the right matter.

Finally, the generalisability aims extending the result of the study onto a wider context and in qualitative study this means that the case study can be extended with theory (Eriksson & Kovalainen, 2011, p.3) In this study the theory is accompanied alongside the process and I tried to gain the best side of that (Gioia, 2013, pp.21,23). The generalizability in this study started to show already after coding the data, when the themes started to remind the already existing ones.

4 RESULTS OF THE EMPIRICAL ANALYSIS

In the following text there is presented the results of this study placing them in the middle of the theoretical framework that was provided earlier. They also mirror the results towards the knowledge from the academic literature about the circular economy and the context where this study is conducted in.

Ten themes were found in the study; Environmental Conditions, Social Capital, Prior Knowledge, Systematic Search, Cognition and Entrepreneurial Alertness, Challenges, Sustainability, Emotions and No Prior Knowledge. From these, seven can be also found within the previous literature regarding the linear economy and six of these are named after the work of Mary George et al. (2016, p.328); cognition, entrepreneurial alertness, environmental conditions, prior knowledge, social capital and systematic search. The concepts found in this study are written with capital letters unlike the ones found in previous literature as this also respects the original style but also to make a difference between these particular concepts mentioned here.

By this study these ten factors within the circular economy are found to interact between the opportunity and the discoverer. The factors are connected to opportunity recognition in the circular economy in several ways and give a multi-dimensional perspective to it.

4.1 The factors found which relate to the framework: Why some individuals recognise business opportunities?

Environmental Conditions

The total number of categories under this theme was 31. This theme started to build up with factors considering the markets, economics, values, facilities and shared interest. Soon the category started to remind of the category represented in the previous literature. Therefore, my theme Environmental Conditions consists of the same categories that Mary George et al. (2016, p.335) presented in their work as an environmental factor, but later discussed as an environmental condition. Within their work the focus inside this dimension was dealing with politics, economic growth, social context, cultural values and locations.

Mary George et al. (2016) point out in their work that institutional theory has had a great role as a theoretical framework when studying the environmental conditions regarding the opportunity recognition. Also, it is noted that it is important to acknowledge environmental conditions as they influence greatly on how individuals operate and proceed with entrepreneurial operations. (Mary George et al., 2016, pp.335-336)

The theme became a combination of several units that represented factors that existed within the surroundings, like regulations, overall with 298 codes. The highest scores went to the Development, Economics and Markets. Then again, the lowest were seen in Decreasing costs, Weak and Availability. The example of the most scored category Development would be; *"we've had with enhancing…"* (I4). As I earlier stated, my goal was to save some depth visibility by serving some of the categories that looked like they could be combined on first sight. For example, taking Economics, Markets, Growth, Finance, Demand and Global Market Trends, all these categories could be grouped under markets, but when considering the raw codes and questions behind them they start to get meanings that speaks for separating them.

Taking few examples: Economics concentrated on costs; *"…the apartment price per square metre should actually be calculated…"* (I6). Markets appeared when there was discussion about the changing markets: *"On the other hand the business environment as well has changed a bit…"* (I1). Growth considers the possibilities to grow.; *"...I see...the field growing..."* (I3). Finance concentrates on the financial solutions; *"…funding round…"* (I1) when Demand points out the exact need within the market; *"...it all started when we had defined what was this customer need..."* (I6). Global markets points out a directly wider scale; *"...global megatrends, which are in economic sense..."* (I1). All these are issues of the same theme but differs with the core idea. Therefore, they are left as a separate category, but they are within the one theme. It does not impact negatively with the results. In fact, it gives depth and visibility.

In this factor, like in seven other themes, some categories were mentioned when challenges were asked about, but also in other questions. Therefore, these were not seen only problematic, but evidently there were also challenges. These categories were; Regulations, Image, Standardisation, Markets, Economics, Politics, Development and Safety. When looking into them and taking few examples, it can be seen why they have this dual effect. Regulations were seen positive; *"the official standard directives has lightened up a little bit lately"* (I5) and *"on the other hand, regulations at the moment support wood construction"* (I1), but also challenging; *"Our construction directives differ from the other countries"* (I6). Safety was

considered a good factor; *"with proper treatment, wood can last fire burden longer"* (I2), but when asked about challenges, safety appeared, but only once in a context of fire safety and issues around it; *"And then there's fire-related questions…"* (I5). These factors can be also found when looking at the prior literature about the barriers existing within the circular economy, as those are relating to; culture, regulations, market and technology (Kirchherr et al., 2018, pp.266-267).

The categories that were only acknowledged when considering the challenges were; Global Market Trends, Availability and Weak. For example; Global Market Trends; *"…if there's economic recession, then construction generally quiets down…"* (I1) and Weak; *"…gets wet…and water damage…"* (I5).

The factor was filled with issues all around in the environment. When considering Politics, it was seen highly influential and actual; "*…the government will decide their policy for supporting wood construction…"* (I4), and category Media points out the media hype; *"…created interest towards it."* (I6). The experience differed from the projects. This is easily seen with the regulations or with fire safety as pointed out earlier. The factor considers deep and multidimensional issues and effects highly on daily operations and decisions.

Environmental Conditions are the base where the SMEs are operating, and when considering not only the first research question but also the sub-question, it plays a role there. Environment supplies different kind of facilities, for example, and creates possibilities to start to build opportunities; *"…facilities were kind of good…"* (I3)

Social Capital

In my study this is the second largest theme with 21 categories and 142 raw codes. The three biggest categories are; Partners, Co-operation and Planners. The example of the partners would be; "*…set out as a co-partner..."* (I1). In this section there were a lot of names provided so therefore I created this category, but on some occasions, it was only announced that partners were involved. The smallest categories named were Wood Industry, Architects and Bank. With the social capital it seemed that entrepreneurs were very careful with that. Also, as a researcher I respected that, as I understand the value of the social capital. In this theme it is well presented that the categories that get only one code still matters as I am quite sure that every entrepreneur deal with banks, for example. The issues behind why there is only one mention of for example

banks can be several. It was just easier to answer partners than start to name several instances. With this I want to point out that sometimes the single codes do matter.

Within this theme there appeared also some factors that were answered in both questions in positive and challenging. Such were Co-operation, Manufacturers, Partners and Customers. With one glance these all seem very positive or even necessary. When the data is observed with more depth, we understand that for example the industry needs more activity; *"We would need to get construction business to go with this…"* (I6), and also customers are much needed; *"…customers…"* (I4).

The factor social capital was also found in the research conducted by Mary George et al. (2016, p.333) where they point out the importance of the weak ties and the existence of brief acquaintances. Also, the social capital is seen as an influencer in opportunity search and the research is acknowledged much more homogenously than the effect of prior knowledge. They note in their work that opportunity recognition is a studied concept in different geographical contexts hinting that it differs. (Mary George et al., 2016, p.333) Prior research points out that sometimes weak ties are more beneficial than the strong ones (Kontinen & Ojala, 2011, p.493). Also, managing the human resources well has a positive effect on the forming and benefitting from the opportunities. In creation the recruitments are more fitting when directing flexible general human capital from pre-existing networks. (Alvarez & Barney, 2007, p.139)

This theme is also valuable concerning the sub-question for the research question, as it is discussed earlier in this text that strong and weak ties provide information. The information can be used for opportunity creation or for building the future Prior Knowledge.

Prior Knowledge

This factor is the fifth largest in my research with 73 codes and 3 categories. Before this theme there are Challenges and Sustainability. The codes appearing in Prior Knowledge are; Experience, Born in It and Active. In my study the Prior Knowledge meant the gained expertise. For example, from education; *"education has become, has been helpful…"* (I1). The knowledge may have been also gathered from the surroundings*; "growing up"* (I2) or just being active; *"as a youngster, there was more zeal and energy than understanding*" (I5). Also, the factor consists the already gained expertise; *"that minimizing all material waste and recycling and sorting and all things around that are very familiar indeed"* (I5).

Also, Mary George et al. (2016, p.331) pointed out the importance of prior knowledge and lifted up the interest towards its precise role in the process of opportunity recognition. Within this factor in this study there was one category which appeared when challenges were asked and this was Expertise. Why this was not coded under Lack of Knowledge was because the code was related more to gaining knowledge.

The Prior Knowledge as all the other themes in my research answers both the research question and its sub-question on what the main factor are and how the opportunities are recognized. Without prior knowledge it is hard to discover opportunities (Alvarez & Barney, 2007, pp.136-137). Prior knowledge is linked with business creation using systematic search; therefore, it is strongly tied with the way of seeing opportunities (Baron, 2006, pp.110-111).

Systematic Search

Systematic search plays a role also within the work that Mary George et al. (2016, p.337) conducted. Systematic search can be seen to spring from prior knowledge and social capital. (Mary George et al., 2016, p.337). In my study this factor includes 41 codes and only two categories. The categories are Search and Set Goals. Also, Search was lifted up when challenges were asked. Search appeared in the interviews for example after a discovery which had been done before through prior knowledge or when a new project was started; *"...I found through the internet..."* (I1). Also, Search was involved when the goals were set; *"then we started thinking about our client base"* (I1). The decisions were weighted through the search; *"...we discussed about it and thought about the future of wood construction field..."* (I3). Search appeared when the partners were looked for*; "...almost even googling around ..."* (I2) and when market research was done; *"...a little bit of market research ..."* (I1).

Systematic Search is also a notable factor as it is highly involved with the research sub-question: How SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities? Systematic search enables the finding of new opportunities (Zahra et al. 2009, p.522). It can be so that Entrepreneurial Alertness has pushed reaching towards more information as shown before or by search there are opportunities created as the creation theory promotes. Search itself is not the point of creation theory, as the opportunities has to be created, but action is a central part of creation theory. (Alvarez & Barney, 2007, p.131)

This action is also part of this theme as it consists all the search that can be done to gain more knowledge and tools to operate. Notable is that this is also a part of the discovery theory as the opportunities are appearing through exogeneous shock and if the environment is scanned the changes are revealed (Alvarez & Barney, 2007, p.128) Therefore both theories are related to search and also the research sub-question.

Cognition

In this study the theme consisted 35 codes and 6 categories and only Interest was mentioned when challenges were asked. Authority was related often with the title or the person who made the decisions; *"CEO"* (I3) and the same situation was with the category Independent decisions; *"We do decide… decide partners in the projects…"* (I1). Willpower, Leap of Fate and Interest were mentioned when describing the entrepreneurial path or when describing the reasons for being an entrepreneur. These were also mentioned when the whole industry was considered and the development processes were described; *"…from the volition…"* (I3).

In Mary George et al. (2016, p.333) this factor is named cognition and personality traits. This is also the starting point when I combined my factor. Their research points out that the study of opportunity recognition lifts up particular characteristics that are related with venture creation. It is brought up that the research is not unanimous concerning the individual personal traits. (Mary George et al., 2016, pp.333-334) There has been evidence that psychology, demographics and believes matter (Shook et al., 2003, pp.381,394-395). Also, it has been discovered that entrepreneurs make a mental connection when the opportunity is recognised. This points out that cognitive processes have a strong impact on this matter (Grégoire et al., 2010, p.413).

In consideration of the research sub-question this theme plays a part on the way people think and act, by their position or based on their believes; who they are (Shook et al., 2003, pp.381,394-395). This is the factor that cannot be removed or ignored as this theme plays a great role when considering who is making the decisions.

Entrepreneurial Alertness

In literature it is pointed out that if the entrepreneurial alertness is sensitive the opportunities can be noticed without a systematic search (Mary George et al., 2016, p.336). As stated in previous literature, the ways in which entrepreneurs and managers recognize opportunities differ, as entrepreneurs have more common alertness (Shook et al., 2003, p.387). This is the third smallest factor within this study. There are 14 codes with 3 categories and yet there are a few mentioned when challenges are asked. Insight, Future Visions and Discovery points out the sensitivity to operate in the market. For example, comments like; *"we kind of started anticipating"* (I1), reveals the intensity to spot the opportunities. Also, critique concerning the projects were announced; *"over-optimism"* (I6).

Entrepreneurial Alertness in one of the themes that is involved strongly also with the research sub-question. When the creation theory and the discovery theory are in consideration, both need somewhat understanding when the opportunity is faced. It is not certain that all understand an opportunity when they see one. (Alvarez & Barney, 2007, pp.124-125)

4.2 The factors found which differed from the framework

Challenges

Challenges were the third largest theme. It consisted 131 raw codes, but only five categories. Those were; Lack of Experience, Expenses are Higher with Apartment Buildings in Wood Construction, Louder than Concrete Buildings, Unclear Regulations and Optimise Reverse. Most of these were mentioned when asking about challenges, but not all. This factor was Optimise Reverse and was located when considering the circular economy. The cycles are not totally eco-friendly even in the circular economy (Korhonen, Honkasalo & Seppälä, 2018, p.43).

The theme Challenges appeared within the several questions and therefore it was acknowledged as an important factor influencing on business opportunity recognition within the circular economy. Also, here within the theme challenges we can see confluences with the barriers that are acknowledged in the prior literature, pointing directly to the categories. The main categories

are; cultural, regulatory, market and technological. From these, the only one that does not show up clearly through categories is the cultural. (Kirchherr et al., 2018, pp.266-267)

The challenges were clearly pointing the factors that still need development and everyone had their own problems. For example; *"the reason is just the costs"* (I2) and *"…will also show on the customer's excel sheet's last row…"* (I4) or *"when we start improving our profitability by trimming out the objective, then the customer doesn't want to buy it anymore"* (I6). The field is new in Finland and it showed in the results; *"for wood construction to become common is a bit… yes, there's still a lot of work to be done"* (I3). The planning was highlighted in the results; *"there wasn't any experience in wood apartment building planning, so it brought a few challenges and through that also costs"* (I2) and *"…a challenge at the moment, when the field is so small, is to find competent designers"* (I1). Other challenges were pointed out to elsewhere within the product; *"of course there's in this wood construction solution, there's sound, particularly sound questions, become a little problematic"* (I5) or seen that the regulations should be clear; *"local building supervision authorities interpret regulations quite differently"* (I1).

The theme Challenges were represented also in other questions than just the ones where the actual challenges were asked about. It seems that these factors that has connection on opportunity recognition with negativity involves with experience on several section, but especially with planning; *"…because you don't need to forget to place but one electric socket into the wall frame at the factory, then at the construction site it's just impossible to put it there… …"* (I6) and costs; *"...15-20% more expensive..."* (I2), but also co-operation. Co-operation was not directly mentioned in the Challenges, but with it there may be possibilities to reduce some of the mentioned factors like expenses. If there is more co-operation with planning, there would be less last-minute changes and the costs might decrease. Within the circular economy, the network is highly important for its success (Korhonen, Honkasalo & Seppälä, 2018, p.44).

Planning seems to be needed within every sector from the beginning until the end of the process. Manufacturing needs planning in order to be more efficient while maintaining high quality and the contractors should be more aware of the special specifics that is characteristic of wood construction when apartment buildings were considered. The co-operation between the contractors and manufacturers was seen highly important; *"It is hard to imagine, that construction would change, if the builders aren't doing it."* (I6) Also, it should be kept in mind

that circular economy is competing within its own genre but also with the business that has been done before; here it means other than apartment houses made of timber (Korhonen, Honkasalo & Seppälä, 2018, p.44).

When in consideration of the research sub-question, it has to be acknowledged that challenges are clearly part of building a new field while the experience is built, as it was represented that more knowledge is needed, for example; *"it just doesn't come that fast, the knowledge and experience"* (I1). This theme affects also how opportunities are seen.

Sustainability

Sustainability is the fourth largest theme with 11 categories. The theme is named Sustainability as there are several issues considered with it. Not just the circular economy or ecological factors; *"the production of cement, bringing cement to Finland from overseas and… so that'll use considerably more natural resources"* (I4) but also factors that relate to responsibility; *"more ecological and resource-wise"* (I1). Then again, the theme is not named responsibility because there is a discussion about the circular economy and that is more an option for a business model with sustainable ideas (Murray et al., 2017, p.371). There are a lot of similarities with these two. It is acknowledged that there are differences between the circular economy and sustainability for example in goals and origin. (Geissdoerfer et al., 2017, pp.762,764) The theme called Sustainability looked appropriate while the circular economy is a possibility to do a sustainable business (Murray et al., 2017, p.375).

The size of the theme can partly have to do with the reason that the factors related to the circular economy were asked in section two. However, it is quite clearly pointed out in the codes that the circular economy is not a main feature if they do not consider themselves operating within the circular economy; *"…we haven't set about it with that in front …"* (I2). On the other hand, all the interviewed parties recognised the circular economy related factors in the core element of wood construction. Some instances saw more of it than others. Some were able to present large descriptions how they are involved in the circular economy with several areas of their business.

The three biggest categories were Optimise-Remove Waste, Responsibility and Regenerate-Retain. Optimise was lifted in several ways when forests and their use was talked about. It was recognised that the wood used within construction was cut soon after the most effective phase

for storing carbon oxide was gone*; "…it absorbs more of that carbon dioxide, so that precisely it absorbs after the strongest growth…"* (I4) and the Regenerate was acknowledged as well; *"…from regenerating timber…"* (I1). Here the field is using the nature's reproductive cycles and that can be seen beneficial for a circular economy company (Korhonen, Honkasalo & Seppälä, 2018, p.40). Responsibility was a category that bound several factors within sustainability; *"these materials will be emphasized socially"* (I3).

The reason why sustainability is such a big theme can also point to the main theme of this study. Because these companies were not directly under the circular economy, I introduced the framework by the Ellen MacArthur Foundation in the beginning of the interview and this framework was discussed in section two (McKinsey, 2015, pp.25-26). Also, because only some of these companies were familiar with the circular economy, I had to explain why I was doing this study with extreme care. These conversations led for sure this section to be so large.

The more important finding with this is that every instance recognised some of the features and when I asked further questions, they confirmed the factors of being involved in the circular economy. Not all saw the circular economy as a form of economy. In these conversations it was confused with recycling or equivalent factors. It is true that a main element of the circular economy is recycling (Murray et al., 2017, p.371), but it also gives an option for sustainability in business and encourages waste reduction (Cooper, 1999, p.10).

Some of the companies knew already that they are strongly involved with the circular economy and the connection was evident; "*If we look at the carbon footprint just from construction, before use, where we can make an impact with material choices, so there wood solutions are just pretty superior…*" (I6). One of the interviewed even stated that they did not have any prior experience with it but now they have (meaning even before this interview); "*but here we have*" (I1).

Within the theme Challenges, the category Optimise Reverse was pointed out. This observation brought us around an important matter. Behind the category there was a factor that some technical solutions within the wooden apartment buildings uses more wood than others; "*But in that, in a way, I feel that the use of wood could go in a sort of against the general circular economy thinking*" (I6). This point is highly important because the circular economy has its challenges and it is not evident that the circular economy is always sustainable. In the previous studies there are possible factors promoted that do not support sustainability to remain within the circular economy (Korhonen, Honkasalo & Seppälä, 2018, p.38).

However, now when we are talking about wood, we also have to point out that if some methods would use wood more, then the carbon sink is also bigger. Therefore, it sits within Regeneration; ”…*in that sense it is much more reasonable* …” (I6). Also, sustainability was pointed out; “*it would be pure madness to go on an un-sustainable road with the use of those forests*” (I6).

However, we can say that within the circular economy and within wood construction, the factor that is here labelled as Sustainability is acknowledged. This finding differs with the research before where Franzini et al. (2018 p.159) points out that ecological matters might have been too self-evident. These studied SME’s mostly acknowledged the ecological factor behind their business, but not necessary the connection towards the circular economy. Also, most of them acted according their pro-environmental behaviour, but always in a limit of their core business. Which is also pointed to be important factor within the previous literature. (Rizos et al., 2015, p.11; Piispanen et al., 2019, p.467)

When considering how the opportunities were created, it was not directly bonded or the first considered factor within wood construction, but surely it has a connection on business opportunity recognition and how they were recognised. Especially through Cognition and Emotion; ”*this is kind of a value based leading and things related to it has always been a point of interest*” (I1).

Emotions

Emotions is the smallest of my factors and it did not appear when challenges were asked. There are two categories and six codes. In my studies Passion and Affection were not united because the first one related more to the factors considering the field when the later was describing the moods. These factors could have been united with cognitions as they have tight relationship with emotions (Baron, 2008, p.335).

These codes were kept separate from the others because of their unique form describing feelings and describing this study with more clarity. One example of this factor as represented before; ”*this is kind of a value based leading and things related to it has always been a point of interest”* (I1). This particular code could have been placed under Cognition as well, but because being able to pursue towards one’s interests evokes good emotions, it was placed under Emotions.

Emotions are identified also within the prior research. Mary George et al., (2016, pp.319,320,328) lifts up the relationship between the opportunity recognition and emotions and points out towards Baron's (2008) and Li's (2011) work. Baron (2008, p.337) points out the benefits of the positive feelings like creative cognition, but reminds that they bring biases, if the balance is not right. He also brings up the negative emotions that can be caused by the hectic environment and therefore affects business opportunity recognition. (Baron, 2008, pp.328,332) Li (2011, p.292) clarifies that emotions are connected with the judgment of decisions about new business possibility.

With the way emotions are connected to our judgements (Li 2011, p.292), they are an important part also on the research sub-question where the way these factors are connected with business opportunity recognition is looked for.

No Prior Knowledge

No Prior Knowledge was the second last theme with one category New Field and nine codes. Why this is a theme on its own is because it was clearly expressed that something like this had not existed in Finland before. It was not a challenge as it was just something to work with; "previously *that wood construction primarily, which was, it was like small house construction"* (I3) or" yes*, there was some wood construction, but it was kind of small in that"* (I1).

It also seemed that quite a few challenges were originating from this factor, but New Field is so much more. It is also a create potential and excitement; *"…everything has been learned…"* (I4). This particular theme associates also with the research sub-question; how the opportunities are recognised. This factor is relevant when considering that the field is not there and yet it is recognised.

4.3 Business opportunity recognition in the circular economy

When regarding the question how SME's within the circular economy, specifically in the wood construction and the apartment house building with timber, recognize business opportunities, we can first turn the attention to our findings with the themes; Environmental Conditions, Social Capital, Prior Knowledge, Systematic Search, Cognition and Entrepreneurial Alertness,

Challenges, Sustainability, Emotions and No Prior Knowledge. When looking behind these factors and starting to look for answer how the opportunities are recognised, we notice that all these factors are relevant.

With the Entrepreneurial Alertness these seem to be bonded with personal experiences from the various resources*; "we kind of started anticipating"* (I3). This leads to situations where the search has begun, for example, from the mentioned social network; *"...with whom we talked about it…*" (I1) and later prior knowledge was gathered; *"a little bit of market research"* (I1). Then again Environmental Conditions have encouraged to start the business; *"...the existence of a factory and then the will..."* (I4), but regulations and politics has their own weight; *"the layout"* (I2) or *"also from the political decision-making of the municipality"* (I6).

When the factors are looked at with care, it can be noticed that they are connected. It is impossible to say with some cases if the opportunity was recognised before the search or with the search; *"...with a post-it exercise pondered that what should be..."* (I4). Maybe the opportunity had been recognised already and the search was needed or was it so that new opportunity wanted to be found and therefore the search was made. It seems here that the opportunities are both discovered and searched. However, sometimes their distinction is not possible. Similar results were gained by Corner & Ho (2010, p.645) within their study. Search is linked with opportunity creation and opportunity discovery is linked with exogeneous shock and the opportunities are seen already existing (Alvarez & Barney, 2007, pp.127-135). In their work Mary George et al. (2016, p.328) found both creation and discovery within their studies. Also, here it seems that opportunities are found with creation, but also with discovery.

The opportunities recognised were intertwined with several factors as mentioned before. Opportunities were seen because of facilities were available; *"...facilities were kind of good..."* (I3) or the business field was missing; *"the equivalent was missing anyways"* (I1), not forgetting the perseverance; *"it was self-evident that construction field"* (I5). The prior literature acknowledges this and points out that opportunities involve more. There is Opportunity confidence where it all starts, New venture ideas and External enablers. (Davidsson, 2015, p.675) This gives a deep understanding of the opportunities and, as in the previous research, also in this one we find out that opportunity recognition is a combination of several factors. Imprinting and reflexivity has their role with the opportunity recognition. There is information drawn from social and historical backgrounds, but also analysed and solved problems. (Suddaby et al., 2015, pp.5-6)

SME's discover opportunities through certain factors. This study has pointed out several matters and examples how the opportunities are recognised within the circular economy. The interaction within these opportunity recognition processes has been evident. Previous literature points out the nexus between the actor and non-actor meaning the entrepreneur and opportunity that are considered with the three dimensions mentioned (Davidsson, 2015, pp.675-677). The opportunity has been seen through creation or discovery depending on the project, as the prior studies have also pointed out (Alvarez & Barney, 2007, p.135). It is self-evident that not only discovery or creation play a part. When looking past this, the note-worthy factor is what is happening in the process. Opportunities have their effect on the outcome. There is action between the recogniser and the opportunity itself; *"the desire to realize"* (I3), "…*the encouragement of wood construction has been written in the town or city strategy*…" (I6) or *"wood is used too little in Finland"* (I5).

4.4 Summary of the research results

The main results of this study were that the factors that are connected with business opportunity recognition within the circular economy, more precisely in wood construction and apartment house building with timber, are quite the same than in business in general. The ten factors found were; Environmental Conditions, Social Capital, Prior Knowledge, Systematic Search, Cognition, Entrepreneurial Alertness, Challenges, Sustainability, Emotions and No Prior Knowledge. The different factors from the linear economy gathered were Challenges, Sustainability, No Prior Knowledge. All the other factors had been discussed within the previous literature and found also within the linear economy.

Sustainability as a factor relates to this study very well and evidently belongs within the results, but its size would be smaller if there would not have been the sector two within the questions that were asking about the circular economy. Also, presenting the circular economy model in the beginning of the interview and having the conversation about the circular economy had an effect on the results. No Prior Knowledge and Challenges are central themes as the field is very new and from that issue there are several factors stemming. From there come the challenges, but also the opportunities.

The results point out that business opportunity recognition in the circular economy springs from creation, discovery or both depending on the context of the project. It involves nexus between the party who has discovered the opportunity with the opportunity itself. There are several factors involved with this which depend on the opportunity and its form. By this study it is also found that the ten factors interact altogether with the nexus. In the following Figure 12 it is represented how opportunities are recognised within the circular economy and within this study in wood construction.

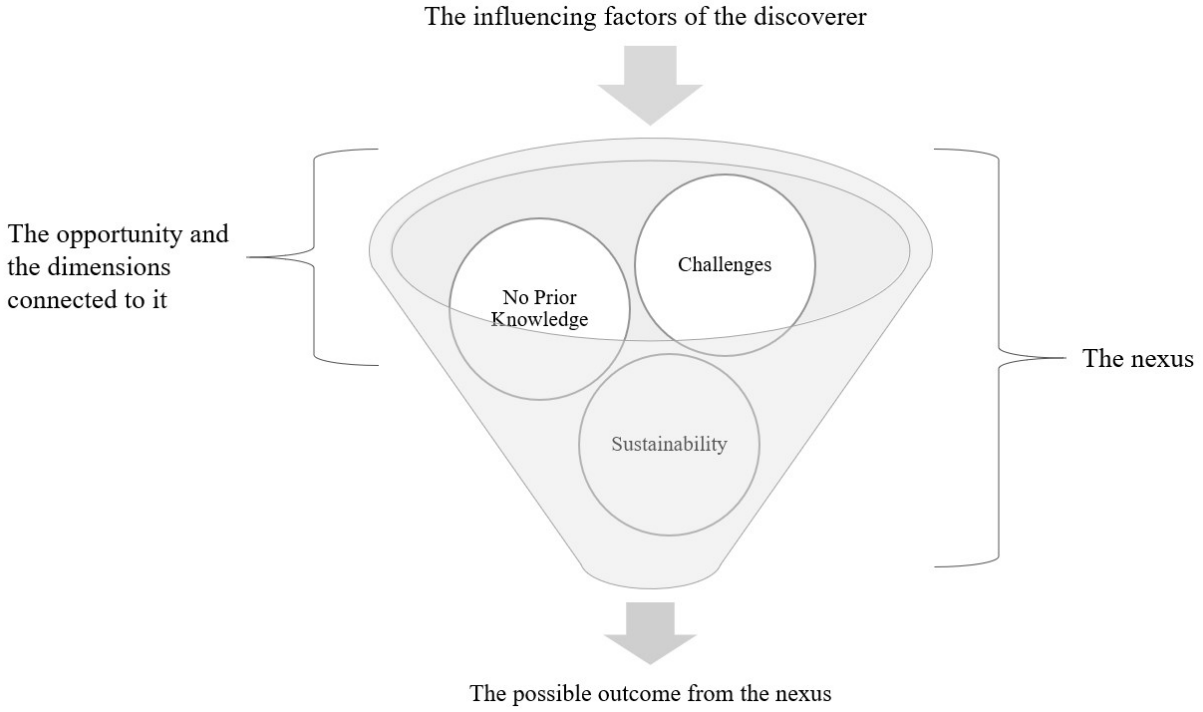


Figure 12: How the opportunities are recognised within the circular economy and within this study in wood construction.

5 CONCLUSION AND DISCUSSION

In the following text there are summarised the results and pointed out the key results binding them with the main literature that connects with them. After that there are the limitations, future study suggestions as well as managerial implications given.

5.1 Summary of the results

This study has concentrated on SME's and business opportunity recognition within the circular economy. The context of the study has been SME's operating in Finland within wood construction, more precisely the ones that have gained experience from apartment houses. In this study the focus is on business opportunity recognition in the beginning of the company's operating years, but also later in its life cycle when new operations for the organisation are developed. Expert and SME interviews were conducted. These semi-structured interviews were transcribed and analysed with inductive content analysis. With this the aim was to look for an answer to the research questions: What are the main factors that are connected with SME's business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building with timber? And then the sub-question: How SME's within the circular economy, specifically in wood construction and apartment house building with timber, recognize business opportunities?

The study found ten main themes where three differed from the previous studies. The opportunities were discovered, created or both depending on the context and the interaction between the discoverer and the opportunity played a clear role.

5.2 Key results

In this study the results consider factors influencing on business opportunity recognition within the circular economy field, more precisely in wood construction and apartment house building

with timber. There were ten themes which were; Environmental Conditions, Social Capital, Prior Knowledge, Systematic Search, Cognition and Entrepreneurial Alertness, Challenges, Sustainability, Emotions and No Prior Knowledge. Three themes that differed from the linear economy were; No Prior Knowledge, Sustainability and Challenges.

Emotions was one of the themes that was found also within the previous literature. Even though emotions were also acknowledged in the study by Mary George et al. (2016, p.328) by lifting up others' work, it was not added in their framework. Emotions and their relevance to business opportunity recognition were introduced, for example, in Baron's (2008) and Li's (2011) works. The six factors also existing within the previous literature were; cognition, entrepreneurial alertness, environmental conditions, prior knowledge, social capital and systematic search (Mary George et al., 2016, p.328).

The found factors have their own role within the opportunity discovery within the circular economy and they are connected. When these factors were discovered, they were observed with more depth, examining how opportunities are discovered. In the theoretical framework there was also the opportunity creation and discovery represented as two different theories (Alvarez & Barney, 2007, p.164). In this study it was found that the opportunities were discovered, created or both and these seemed to be dependent on the project and the factors involving around it. These results were supported in the previous studies as well (Mary George et al., 2016, p.328; Corner & Ho, 2010, p.645).

Finally, within the framework it was proposed that opportunity considers three different elements within it and the opportunity discovery involves the nexus between the actor and the non-actor, meaning the entrepreneur and the opportunity. The three constructs within opportunity were; opportunity confidence, external enablers and new venture ideas (Davidsson, 2015, p.676) The process was not only in the hands of the discoverer but also dependent on the opportunity. The nexus between the discoverer and the opportunity mattered. In this study it was evident that there was a nexus between the opportunity and the discoverer. There was an interaction between these two. The notable finding with this study was that the factors involved with opportunity recognition within the circular economy were not just the factors that the discoverer had; they were factors that were involved in the nexus.

5.3 Limitations, future study and managerial implications

The limitations of this study can be considered to be within the data collection. Even though there was carefulness with this factor considered, there were still some inaudible spots within the recordings. Luckily those were not parts that mattered. Limitations were also related to anonymity as there had to be prudence not to expose any of the identities while writing the results. This left in the dark some describing features.

Limitations can be also considered to be within the objectivism as the analysis process and the results are always interpretations of the researcher. There are always some subjectivist viewpoints even though the aim has been to be objective. On the other hand, the answers are always interpretations of the studied objects. Also, the study is bound with the time and the location as well as with the field. Therefore, the study cannot be directly transferred for example on to another field and the results used there.

Other limitations were included with the interviews. Some of the interviews were done over the phone and some were done face-to-face. These interviews done over the phone were missing the information that involves when people are interacting with a present person. With the interviews I tried to be as clear as possible so that this factor would not affect the study as much. Also, I had to explain with care the circular economy framework that was used in the study and when it was discussed further in the study, in section two it accumulated the issues involved within the conversation. Therefore, the issues related to the circular economy are largely represented within the study. This was partly because the actual study is about the circular economy, but also because of the section two in the questionnaire that consisted of circular economy questions.

There were several topics revealed while this study was conducted. Firstly, there should be studies on more apartment buildings with wood construction and their connection towards the circular economy. Secondly, it could be studied how many industries are actually already within the circular economy without a clear connection to it? Thirdly, an important factor is how value behind the circular economy is understood? Is it such a new way of thinking that it does not fit yet today's business world? Or when the business is a circular economy company and is it enough if some parts function on that field? The units of the circular economy could also be studied, and how they are born and what are their stories or even their businesses themselves.

Here with the unit I mean settlements where, for example, office buildings get their heat from the next-door factory and what are the relationships in this kind of symbiosis.

The study points out that the circular economy can be found within the today's ordinary business and not even recognised at the first sight where it is existing. That is an important factor as it makes the circular economy less something special but more just an ordinary way of operating. That is the view that is important for the circular economy's success. The studied field is new in Finland and therefore there are still a lot of things to solve. However, these pioneers are developing their products and ways of doing business. The co-operation is an important factor and there needs to be careful concentration on the possibility and search for the solutions as there are several factors involved in the situation.

This study gives managerial implications not only towards the circular economy but also for wood construction when apartment buildings are considered and reveals the matters that are influencing on the studied subject by venture's point of view. Moreover, it provides information to policymakers and other studies concerning the circular economy but also to wood construction and entrepreneurship.

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APPENDIX

Questionnaire:

The individual and the entrepreneur

1. Tell me about yourself.

2. What made you to become an entrepreneur? (The questions above relate to person's life as well as people, events and actions which have made the person recognise or create circular economy business opportunities and pursue towards their realisation. Here it should be asked to identify concrete events to a time line.)

3. Did you know the field before this company or did you have any other circular economy companies before this one?

The circular economy storyline

4. Tell me about your current business.

5. What does the circular economy mean in your business? (Present the circular economy models and ask the interviewed to identify the one which the business idea in question fulfils. This should have been outlined beforehand, but it should be confirmed with the interviewed or ask them to depict.)

6. What are the biggest challenges for your current circular economy business?

7. How would you see your circular economy business within a few years? What kind of new projects / incipient businesses?

Developing the idea

8. Where did you get the idea for wooden apartment building? How was the idea born?

9. What initiated the founding process of the company?

10. Who initiated it? Why?

11. Who participated in developing the idea?

12. Who were asked to participate – why?

13. Which external parties were involved? What did they do? How did you find these external parties?

14. Were there any other external factors which would have influenced on it?

15. Who were your most important external partners? To what extent were you able to find suitable external partners for your projects by yourself? Who makes the decisions on them?

16. What barriers/problems did you face? How were they solved?

17. What did you learn from the business development process? What others could benchmark from this exact process?

18. What would you now do differently and why?

19. Who made the decisions in the process you have described? How were the decisions made? (It is possible here to return to the concrete events outlined before and go through each of them.)