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1 Introduction

This chapter aims to introduce the reader to the timber construction industry, Cross-Laminated Timber and innovation in conservative industries. Here the background, problem and purpose can be found.

1.1 Background

In our previous contact with the construction industry, we've found that it is traditionally conservative and slow to adapt changes and innovations. This is also discussed by researchers such as Dubois & Gadde (2002) and Blaise & Manley (2004), where they find short term productivity being emphasised over innovation and learning is highlighted as one of the potential problems. This short term productivity may be the result of the industry's way of working with projects, where bringing knowledge from one project to another might not always be the norm (Håkansson & Ingemansson, 2012).

From a historical perspective, the usage of timber in multi-storey buildings was very limited due to national building regulations, where in Sweden, all wooden buildings of more than 2 stories were banned until 1994 (BBR94). In recent years, these kinds of regulations have been changed to the benefit of timber in most European countries, but also in North America and Australia. This shows the political will of having more timber buildings in the future due to the ecological properties of wood compared to concrete and steel. Besides the better CO2 and energy footprint, timber construction also offers a higher possibility of pre-fabrication, a high precision and a faster building time (Brandner et al., 2016).

The main materials used in multi-storey timber buildings are Glue-Laminated Timber (glulam) and Cross-Laminated Timber (from here on referred to as CLT). Glue-laminated timber, producing beams of almost any size, was developed and patented 1906 (Serrano, 2003). CLT is a plate element, containing multiple board layers in a 90° angle to each other. This was developed around 1990 and started to enter the market around 2000, with the first technical approval in 1998 (Schickhofer et al., 2010). Following this, more research on CLT Construction was carried out. The research was made possible, not thanks to official instances, but by pioneers and innovators that recognized the potential of the product and the first standardization of CLT didn't begin until 2008 (Brandner et al., 2016). CLT is a timely product at the moment as it has been developed for a while, but not seen major market success until recently.

Timber construction is a very hot topic today in the construction industry as there are big high-rise timber projects starting to show up at different places in the world, now that regulations have changed. More companies are also finally beginning to see the benefit of working with more focus on the environment and

environmental solutions, since customers are now interested in "Green" products (Noppers et al., 2014; Ottman, 2011). They are also starting to rely more heavily on digital construction tools such as the Building Information Model (BIM), which is a system where all the information and drawings are put into one CAD-file to make it easily accessible and easier to make sure that the work always stays up to date as well as different surveying methods. These tools go hand in hand with the abilities of pre-fabrication, since more accurate BIM-models makes it easier to pre-fabricate more of the building parts. Timber is also a suitable material to work within pre-fabrication, since it's easy to shape into customized products.

The reason for CLT not gaining any market success until recently may have several different reasons, such as limitations by regulations, availability, previous costs and more. But there are also other factors that play in, even if a product has many advantages in itself (Ljungberg & Edwards, 2003). There is also the "people" aspect of marketing. Buyers must understand the advantages with the product and learn to like it. Products need to be designed to not only satisfy customers, but also *attract* them. (Ljungberg & Edwards, 2003). The way that a product is marketed towards its targeted audience can change how that audience view the product and even the producer, be it towards a more positive or negative view of the product.

1.2 Problem

Part of the reason for not using wooden construction solutions has been that until recently, most countries and governing instances have prohibited wood-based structures of more than 3 or 4 stories. Some have also been sceptical of larger wooden structures because of concerns regarding fire safety and the "living material"-qualities of the wood itself. Although there may also be other factors that slow down the process. It is therefore hard to precisely tell what makes a product successful in this market. There seems to be no single key aspect that will decide if a product is successful or not, but a lot of undetermined factors, that might even vary with what kind of product it concerns. If there is a particular factor that always play a part in this, it's not easily distinguished. The construction and timber industries are also often seen as very traditional and conservative, which might make it hard to introduce new and innovative products to the market. This can seriously hamper the efforts put in innovation and product development, which is why finding a way to motivate companies of trying new products or solutions is very important. However, many of these companies work in projects, meaning the new products and solutions have to be introduced over several projects, before it can become a staple in the companies' way of working. How could these new products, entering a previously inaccessible market, be marketed then, when people have a long-held idea that all products made from the same material is inferior, no matter how they are made? Looking at CLT will

give us an interesting perspective of a product that has been in development a while but didn't see major market success until recently, which makes it a prime target to use as an example of how innovation within the industry is carried out and received by the market.

1.3 Purpose

The purpose of this thesis is to find out how CLT could be marketed towards a previously inaccessible market that have opened up because of legal or technical changes and/or development. This involves marketing aspects, such as new product marketing and market of innovation. We also looked at the timber construction industry and how CLT has developed and been used over the years and what problems it faced along the way, to be able to find some hints on what has gone bad, or what has been a success. We also investigated if there is any special key factors needed in order for CLT to be successful. To do this we looked at management of innovation and marketing in general. Since CLT is a more environmentally friendly product than its competitors, concrete and steel, we also looked at "green marketing", to see if there is any advantage that can be gained in this area.

2 Theoretical frame of reference

The purpose of this chapter is to provide the theoretical background to both the topic of CLT construction and also the necessary marketing and management

2.1 Abbreviations and important phrases

BIM: Building Information Model – A way of working with construction projects where you have a digital file that contains all information about the project.

BBR: Boverkets byggregler – A set of construction rules and guidelines for the Swedish building industry.

CLT: Cross-Laminated Timber – A timber product where multiple layers of boards are glued together in a cross pattern to form a stronger material.

2.2 Timber construction and CLT

Developments in the early 20th century made it possible to use concrete economically when building. Since then, timber construction have taken a back seat and was reduced to just a few percent of the market for light constructions. However, in the last 10 years, timber have retaken a bit of market share from mineral based materials (Brandner et al., 2016). Demand for a sustainable and renewable construction material are rising in the cities which is where, traditionally, wood as a construction material have been avoided because of its combustibility (Jones et al., 2016). One reason for this is the development of Cross-Laminated Timber (CLT), a plate-like element usually composed of an uneven number of layers. Each layer consists of boards placed side by side and layers are placed on top of each other with a 90 degree angle. This enables the wood to bear loads both in and out of plane (Schickhofer et al., 2010; Van de Kuilen et al., 2011). The idea of this product is in principal not new since similar products have existed for a while (Brandner et al., 2016). However CLT was developed in the 1990s motivated by the sawmill industry needing to find a higher value use for their side boards (Guttman, 2008). The plate elements that make up CLT can be used similarly to the way that concrete is used today, which makes for good possibilities for prefabricating. Properties for CLT was regulated locally from 1998 until 2006, when European technical approvals (ETAs) started. The first standardization activities started in 2008 and the first product standard for CLT just recently passed a formal vote. CLT have now become a global interest because of the characteristics that makes it possible to build so much differently from normal wood (Brandner et al., 2016). Tests have also shown that CLT constructions perform better than traditional wooden construction in fire safety (Evans, 2013). Because of its versatility, CLT is extremely well suited for multi-storey buildings (Van de Kuilen et al., 2011). Switching concrete for wood also gives environmental advantages (Van de Kuilen et al., 2011). Chen (2012) also

found that a five storey CLT building consume less energy over its lifetime compared to a similar concrete building. In the 19th century, timber buildings in Sweden were not allowed to be built higher than two stories, but 1994 saw a change in these regulations as they shifted towards a function-based instead of a material-based limitation system, meaning that you can choose whatever material and methods you like as long as they fulfill the requirements set by the respective functions (BBR94). The previous legislation gave the public the idea that timber was something dangerous to use in cities. These ideas then rooted into people's mind, which might be why, when change finally came they were not as open to it, or willing to follow.

2.3 Marketing

Innovations usually only impact few people initially, because the time required for learning and evaluating precedes the diffusion of the product into a wider population. This is classified as more than a transfer, since it also communicates benefits, costs and comparisons with previous alternatives (Bohlmann, Calantone & Zhao, 2010). This is why, when creating a complex new product, the producers cannot rely only on standardized surveys and trials, but need to engage in learning-by-doing and using approaches with the users. Instead of just expecting customers to be simple buyers of the product, they should be encouraged to interact in the innovation process to create a better learning environment (Hoogma & Schot, 2001).

2.3.1 Marketing new products

The success factor for successful R&D and further for product implication to the market is the management of R&D activity (Atuahene-Gima & Ko, 2001). Research has shown that integrating marketing with research and development is a key factor for success in new product development (Ernst, Hoyer & Rübsaamen, 2010), since this improves the market information flow which is critical to the success of new products (Ottum & Moore, 1997). Sales and marketing also have different functions and orientations, meaning you need not only consider the integration of marketing and R&D, but also marketing and sales (Ernst, Hoyer & Rübsaamen, 2010). Addressing the role of the sales function in new product development should help increase the knowledge about the new products successes and failures (Hultink & Atuahene-Gima, 2000). This involvement and information sharing between the sales, R&D and marketing departments should improve the finding and selecting of more and better ideas in the early phases of new product development, resulting in lower failure rates (Ernst, Hoyer & Rübsaamen, 2010), since product developments and changes highly increase after a product is introduced to the market (Utterback, 1994). The marketing function can then provide relevant information for the new product development, while R&D departments' main focus is generation of new

knowledge and how to apply it to new products and designs (Griffin & Hauser, 1996). Both of these activities need to co-operate and share relevant information in order to develop a satisfactory product that meets market requirements (Griffin & Hauser, 1996). However, once the new technology is adopted by a larger share of the potential customers, the product development and change process slows down (Utterback, 1994).

The difference between the sales and marketing departments is that marketing focus more on the product, while sales focus more on the customer (Homburg & Jensen, 2007). Combining this information is important, since it helps avoiding specific solutions for an individual customers, which in turn neglects market segments that are not in line with the firm's product portfolio (Ernst, Hoyer & Rübsaamen, 2010). What matters most for the R&D department during the product development stage, is getting customer feedback on the technical product design from the sales department (Song & Parry, 1997). Sales-marketing co-operation however, have a more critical role during the implementation stage where they both possess crucial information for the new product performance (Hultink & Atuahene-Gima, 2000). Because of the high-failure rates of new products, the sales department also share a big amount of responsibility for the success of the product, since it's responsible for selling it to the customer in the end (Ernst, Hoyer & Rübsaamen, 2010). Lack of sales involvement in the critical implementation stage therefore reduces the likelihood of a successful product launch (Hultink & Atuanhene-Gima, 2000), which is very problematic for more innovative new products, for which resistance is strong and a big sales effort is required to overcome that resistance (Ernst, Hoyer & Rübsaamen, 2010). This is because customer knowledge and their access on information has a high impact on the success of new products (Joshi & Sharma, 2004). Customer knowledge is the knowledge of, not only the existence of the product, but also how and in which ways it can be used (Joshi & Sharma, 2004). However Hoogma & Schot (2001) argues that user involvement in innovation is also important and that the user-produced solutions could be more innovative than the solutions originally thought out by the developers, which is another argument for involving the customers more on an early stage. The timing of the market entry, product quality and the management support of the innovation also have a high impact on the market success of a new product (Atuahene-Gima & Ko, 2001).

The level of awareness about CLT outside Europe, Canada and Australia is still very low, however the willingness to adopt the material increases with the level of knowledge about it (Mallo & Espinoza, 2015). One of the most attractive features of CLT is the speed and precision buildings can be erected due to the prefabrication opportunities and more precision also results in less waste generation during construction (Evans, 2013; Van Kuilen et al., 2011). However, perceptions are fundamental in new product adaptation, since people's feeling

and beliefs in a product can be as important as actual performance when it comes to a previously unknown product (Cooney, n.d.). It is therefore important to find out how potential adopters, in this case architects and engineers, view the characteristics of CLT as a building material (Armstrong & Kotler, 2013). Tykkä et al (2010) also found that there is a lack of timber engineering competencies in most construction companies. Some companies therefore already worked in an early project stage with architects, in order for both companies to be able to share their knowledge.

2.3.2 Green Marketing

Customer adoption is the most crucial factor in the success of innovations. Noppers et al. (2014) studied the role of positive environmental and symbolic attributes with customers buying electric cars and local energy systems. They argue, that the outcomes also could be transferred to the construction industry. Since green is now mainstream, one of the ways to market CLT is to market it as a "green", environmental-friendly product compared to its concrete and steel competitors, since many people now view green products as "cool" (Ottman, 2011). As the world population grow, the consumption of material grow with it and the need for more environmentally friendly (both nature and people environments) materials and products increases (Peattie & Charter, 2003). Companies therefore need to market their new products with this in mid as well and since businesses nowadays are their philosophies, rather than just what they make, they can influence the public just by standing for what they believe in (Ottman, 2011). There is a difference in how companies market themselves compared to normal marketing and Peattie and Charter (2003) differentiate green marketing from social marketing with five points:

- Green marketing emphasize the physical sustainability of the marketing process, as well as its social acceptability.
- It is a more holistic and interdependent view of the relationship between the economy, society and the environment.
- Green marketing is open-ended rather than long-term perspective.
- It treats the environment as something with intrinsic value more than just how useful it is to the society.
- Finally, green marketing focus on global concerns, instead of the concerns of particular societies.

It is however important to remember that consumers still won't sacrifice functionality, performance, quality and price, just to get green, environmentally friendly products (Lu, Bock & Joseph, 2013). Although Ottman (2011) found that people are often prepared to pay premium prices for products that still possesses these qualities as well as being environmentally friendly. People are willing to buy environmental products, since they are getting more conscious about the environment, want to make a statement or simply to look fashionable. This is

coinciding with Noppers et al. (2014) that also found that people are willing to adopt innovation if there are environmental benefits, however it is important to raise the awareness of the customers on the environmental benefits, so that they can make an educated decision.

2.3.3 Decision making

The buying process in organizations of often rather complex and has several people involved (Webster & Wind, 1972). The decision making in an organisation is made on different levels. These can be grouped in decision-making units as followed (McDonald & Meldrum, 2013):

- The I*nitiator* is the person first suggesting the use of the product. For the building industry this could for example be the architect or the building company.
- The *Policy-maker* defines the framework conditions for an investment. The policies can refer to the environmental aspects, building time or political decisions.
- For most products also the *User* has a big impact on the decision. For the user, expert knowledge is often required in order to have influence in the decision process.
- *Other influencers* may be: the media, technical experts, financial institutions or insurances.
- *Deciders* are the ones being able to make the decision. They may be influenced by others but also by personal preferences.
- *Gatekeepers* can control the information which is entering the organization. They can be in many different positions, such as purchasing officials or product experts.

For selling a product successfully, the right people must be addressed and convinced. This call especially for innovative products representing an alternative to existing solutions.

2.4 Management of innovation

Most explanations of economic growth focus on conditions or incentives at the global or national level, where the researchers have taken a bottom up approach and from that learned that different types of innovation have radically different effects on economic growth (Mezue et al. 2015). According to Manu & Sriram (1996), an aggressive product innovativeness is likely paired with high levels of process in R&D. And with technological change starting to focus on advances in pollution reduction, the substitution of input materials is very important (Ashford, 1993). The design of governmental policies must therefore accommodate these technological changes in order to create possibilities for change in production (Ashford, 1993). Although, Samli (2016) found that some people would prefer that the government was kept out of the market, because they believe it can function well on its own. However he also states that in order for

the market to perform, it needs direction and stimulation, in the form of regulations.

Innovative actors also need to recognize the need for new solutions and build creative ideas (Amabile et al., 1996). Creative ideas are the ideas that are new or unique, compared to the already used or available ones (Shalley, Zhou, & Oldham, 2004). The ideas also need to have the potential to add some kind of value for the organization (George, 2007).

2.4.1 Different types of innovation

Mezue et al. (2015) identifies three different types of innovation: sustaining innovation, efficiency innovation and market-creating innovation. Sustaining innovation is simply replacing your old products with new ones. This is mainly substitutive, since if you encourage customers to buy your new product, sales of the older, previous product will rapidly decrease. Efficiency innovation is producing more for less. This often works by eliminating or outsourcing jobs, improving cash flows. The market creating innovation often occurs after a new industry emerge and their products are too expensive or inaccessible for most people. The market creating innovation then transform these offerings into cheaper, more accessible products and services to reach a new group of customers. Since more people can buy the products, there is also a bigger need of employees that can produce market and distribute these products. This third innovation type is therefore the only one that creates permanent jobs, however a strong economy still rely on all three types of innovation.

2.4.2 Investing in innovation

The right investments are also needed. According to Mezue et al. (2015), the reason that "third-world" countries not create a lot of new jobs with their new and increasing raw material extraction and processing is that, while they still make billions in revenue, they still have a hard time to create jobs. This is because they invest in efficiency innovations, using less manpower and increase productivity (Mezue et al. 2015). Friedmann (2010) states that radical innovations are more likely to come from start-ups that will then create jobs and expand quickly. The amount of resources spent into innovations and research, as well as technological advance, highly differ between the different types of industries (Tidd, 2001). Miller et.al (1982) compared the motivation for innovation in conservative and entrepreneurial firms and found that in conservative firms such as construction (Dubois & Gadde, 2002; Blaise & Manley, 2004), innovations will only take place if they are really necessary, and the companies are facing serious challenges or threats. On the other hand, in entrepreneurial firms, innovation take place "naturally", unless there is something preventing or constraining it. This coheres with Gambatese & Hallowell (2011)'s findings, that innovations in the construction industry occur at a lower rate than in other industries, although a

reason here being strict regulations and codes in fire and sound protection, and for the certification of new products.

2.5 Summary

It seems that CLT possess many benefits and advantages compared to concrete, steel and traditional wooden constructions. Some of these advantages include better fire safety compared to traditional wooden construction (Evans, 2013), environmental advantages (Van de Kuilen et al., 2011) and less energy usage over the building's lifetime (Chen, 2012). This should make the product more attractive to use and therefore easier to market, but there still seems to be some resistance towards using it. This could simply be because of the time it takes for a new innovation to reach a bigger market (Bohlmann et al., 2010). Integrating the R&D, marketing and sales departments seems to be important the success of new products (Ernst et al. 2010; Ottum & Moore, 1997), and customers should probably be encouraged to interact in the innovation process to be able to learn for each other and further improve the success of the product (Hoogma & Schot, 2001). Green marketing also seems like a viable solution, since CLT is friendlier towards the environment than concrete and steel (Van de Kuilen et al., 2011), and many customers seems to like products with environmental benefits (Noppers et al., 2014; Ottman, 2011). Some governmental instances are also pushing the environmental questions with policies regulating these areas, but this could potentially just make the sceptical people even more resistant to the material as they may believe that these decisions should not be taken by the government, but the engineers (Samli, 2016). This is also a rare situation, since CLT is a radical innovation entering a traditionally conservative industry (Gambatese & Hallowell, 2011), which may also be a reason for the high initial resistance to the product.

All of these aspects raises some question regarding to how the material could be marketed. We therefore developed three research questions to guide our study. The main research questions are:

1. What difficulties has CLT faced along the way and why hasn't it seen a strong growth until recently?

2. Is there a key factor that could contribute to CLT seeing increased use?

3. How could CLT, when entering a previously inaccessible market, be marketed when people have a long-held idea that all products made from the same material is inferior, no matter how they are made?

To answer these questions, we looked at the past, present and future of CLT and see how it has developed over the years and what findings and events pushed development forward and caused it to gain increased market share. We also

viewed the problem from the customer perspective; what would encourage the construction companies to use such a product and how do you influence them?

3 Research Methods

This chapter explains the different methods and research philosophies used when working on this thesis. It also describes the quality criteria and ethical considerations.

3.1 Research approach

A qualitative research design was selected for this research, since it gives more freedom in the data collection phase as well as the opportunity to gain more in-depth knowledge about the subject (Kvale & Brinkmann, 2009). The fact that the topic is more complex and the answers to the interview questions could not be predicted beforehand is also a good reason to use the qualitative design. Finally, this also gives more room when choosing the source where the data is collected, which enables a broader look at the topic from several different viewpoints. However, these findings are limited, due to that the sample size can't include every susceptible candidate, but only a limited amount (Patton, 1999). It is therefore not guaranteed that the results will cover the influences and opinions of all cases from all over the world and all time. It is also worth mentioning that qualitative is not a synonym for interpretive. This depends on the philosophical assumptions of the researcher (Myers, 1997).

All research projects are based on a set of philosophical assumptions about how the world is and how knowledge about the world could be obtained (Meyers, 2008). These philosophical assumptions work as the base, or foundation of our work in this thesis. The next thing to decide was how to do our investigations. The thesis is carried out with a constructivist philosophy in order to leave room for context and interpretations as part of the research. Constructivism is based on the idea that reflections and personal experiences form understanding (Andrew et al., 2011). In this case it is necessary to take on a constructivist approach, since it was not clear from the start if a single solution was to be found for this problem. Easterby-Smith, Thorpe & Jackson (2015) say that constructivism emphasise the practical consequences of the research and that this is the most important part of a research. A main part of constructivism is also that it assumes that data is collected in interaction with participants, rather than being discovered on its own. As opposed to this, a positivist approach is more often used in order to test a specific theory, in order to gain increased understanding of the specific area by using quantifiable variables from a sample group in a certain population (Meyers, 2008).

The constructivist approach used in this thesis was selected in order to enable the broad perspective that is required by the problem. This gave us an opportunity to look at the problem from several different angles, which was a necessity since we

had no clear theme from the start. However most importantly, the constructivist approach was adopted in order to keep all data within its context and while interpretations and assumptions can be made, they are not guaranteed to work in another context. This is an important aspect of our thesis because of the very unique situation we decided to investigate, and while we give certain suggestions in the end, they can't be guaranteed to work in other situations. A positivist philosophy was therefore never considered for this thesis, since this specific research don't benefit from assuming a specific theory from the start, nor could we assume that there is a certain set solutions for this problem, regardless of context.

3.2 Research design

The topic for this thesis was chosen due to both authors having an interest for it, and with it being a new product that's been around for about twenty years, but still not seen a massive increase in use yet, there was a unique opportunity to look at a product that have a potential to become popular very fast in the near future. The work then started on framing what aspects to actually look at. From the start it was mostly marketing in general and an interest in finding out why the product haven't seen a massive growth yet. This was the focus when framing the research questions. The literature study helped with explaining how new products could be marketed and gave some insight in what could potentially answer some of the questions we had. To gather data we decided to use an interview study. This was decided from the very beginning, even though we had a suspicion that it would be hard to find willing respondents. For the interviews, a questionnaire was designed in order to have a guide for the interview conversations and for the respondents to be able to prepare some answers beforehand. Half of the interviews were conducted on the phone due to long distances between the researchers and the respondents, and the other half which was closer were conducted face-to-face. Once the interviews were completed, a summary was written to serve as our interpretation of what was being said and to transfer the answers and conversations into a flowing text. The interviews were then coded based on what was being said. Some codes showed up in several interviews, but none of the interviews contained exactly the same set of codes as another. These codes were then categorized in the analysis. These categories were then put into three different themes to be able to distinguish the main topics that was needed in order to answer the research questions. A conclusion was then drawn from the analysis to summarize our answers to the research questions.

Figure 3.1 below shows the pathway progress from the methods point of view. The starting point is our constructivist philosophical assumptions. The research techniques includes the techniques we use and what kind of method we use to collect the data, in this case the interview study. The data collection method itself is how we decided to gather the empirical material which is the semi-structured

interviews that we conducted. Once data was gathered, we used a grounded analysis approach in order to analyse it. The final record of our studies is then the thesis itself.

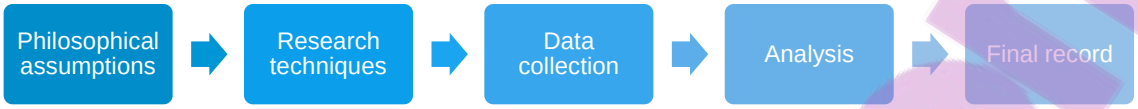

Figure 3.1 - Model of qualitative research (Meyers 2008)

3.3 Data collection

This thesis is done as an interview study, where different themes form the base of the following data analysis. Since this study focus mainly about people's perception of a product and there is a need to form a deeper understanding of the problem, we believe that a qualitative interview study based on semi-structured interviews is as suitable way to conduct this study. That will enable us to gain a deeper insight into the relation between the product itself and people's perception about it (Kvale & Brinkmann, 2009). The results and conclusions in this thesis are mainly based on the data gathered from primary sources. Primary sources are unpublished data that is gathered directly from people and organizations, as opposed to secondary sources that is mainly gathered from previously published materials (Myers, 2011). To answer our research questions, interviews with several companies within the construction industry was held. An interview questionnaire was designed to help with answering the main research questions above.

The empirical data gathered in this report were collected from semi-structured interviews with six candidates. The candidates were selected on the basis that they either have previous experience of working with CLT in projects, or have heard and discussed about it, but have yet to adopt it in practice. This method was selected to give a wider insight to how the industry as a whole is reacting to the evolutions in wooden high-rise construction. It also gave the opportunity of talking to a producer of the product itself to hear how they see the changes and what demand there is for the new product. The interviews were done in an open, semi-structured format. This means that the interview had open questions where follow-up questions are based on the previous ones. The researcher are also supposed to start with trying to find out about the interest for the topic by the candidate (Lantz, 2009).

The semi-structured interview gives us the possibility of working with a set questionnaire while still leaving room for interventions and follow-up questions relating to the original set (Meyers, 2008). This means, according to Meyers (2008) that we can get developed, deeper answers to our questions while still making sure that the candidates answers the same question in order to have

comparable answers. This also links back to the qualitative research model since it enables us to collect rich data from people in different situations (Meyers 2008), and leads to a greater insight of the problem to be able to better answer the research questions (Easterby-Smith et al., 2015)

We started by researching the potential interview candidates to see which companies would be interesting to contact. The contacted companies are both ones with previous CLT experience and companies that know of it, but still have yet to adopt it to get a good sense of how the product is perceived in the industry. These companies were sorted by first asking the question; do you have any previous experience from working with CLT? Depending on their answer, two different questionnaires were used. A producer of the product itself was also contacted in order to hear what they have to say about the development and how they view the future of wooden construction. The questions in the questionnaire varies a bit depending on if the company in question have had any previous experience working with CLT. The answer from the initial question; do you have any previous experience from working with CLT? Determines what questionnaire is used. For those that answered yes, the questionnaire looked like this:

1. Why did you choose CLT?
2. What difficulties do you see in switching to CLT instead of steel and concrete?
3. What advantages do you see as the most important for the material?
4. Where is the main decision of which materials used made? Who has the main influence?
5. What conditions (standardization, prefab, costs, connectors/detail solutions, energy, time etc.) do a new material have to fulfill in order to be used regularly by you company?
6. What do you think is the main reason that CLT is now such a hot topic in construction?
7. What do you think is the main reason that part of the public is still skeptical to CLT?

And for those that answered no, it looked like this:

1. Why have you not used CLT yet?
2. Are you aware of the possibilities of building with wood?
3. What difficulties do you see in switching to CLT instead of steel and concrete?
4. Where is the main decision of which materials used made? Who has the main influence?
5. What conditions (standardization, prefab, costs, connectors/detail solutions, energy, time etc.) do a new material have to fulfill in order to be used regularly by you company?
6. What do you think is the main reason that CLT is now such a hot topic in construction?
7. What do you think is the main reason that part of the public is still skeptical to CLT?

In order to see if the topic is actually interesting to these respondents. When the different companies where selected, they were contacted either by phone calls or e-mail. Personal interviews with the candidates were preferred, but if they did not have the time for a personal meeting or were away travelling or simply located too far away, the interview was done either by Skype or over the phone. We always took notes during the interview, as well as an audio recording, when the respondents allowed for it in order to be able to go back to, reflect on and summarize the interview later.

When deciding on this topic for the thesis, we already had a feeling that finding good candidates for the interviews would be one of the harder tasks of this work. Our fears were partially justified, since it was very hard actually finding any projects that had been made with the material. The initial search only brought us further because of recommendations from family and friends knowing about projects or companies that worked with CLT. From these starting candidates we were then given further recommendations and contacts to help us reach our final results. It was difficult finding and getting hold of these candidates, but once we actually found someone working with CLT, it was not hard to explain them our purpose and getting them to agree to an interview. However, with the people that hadn't worked with the product, there was basically no interest at all, even if they knew what it was. This indicates that the people that use this material is probably the "front runners" that want to stay ahead of the rest and market themselves in this way. As expected, there were also not many sceptical respondents in the sample size. We only found one, and as mentioned in the results chapter, he would not have chosen CLT, were it not for the political policies governing the area of the project.

3.4 Data analysis

The data was analysed using a grounded analysis approach. Grounded analysis derives from the traditional way of working with grounded theory and in this study the analysis variant was considered to be more beneficial. The main reason for basing the work in a variant of grounded theory is that it is useful in developing context-based explanations (Myers, 1997). The way to achieve solid results then is therefore ensuring that the data gathered can be linked to, and used together with the theoretical framework (Locke, 2001). However, since the traditional way of using grounded theory contain some minor flaws for the purpose that we intend to use it for the research in this work, the selected method is instead called grounded analysis. Although it still shares many aspects with the grounded theory in the way of handling research.

Grounded analysis in this case means that rather than having the predetermined framework while analysing (coding) the data, we let the framework emerge during the coding itself. This means that rather than creating a reality and imput

it to the data, the reality will be created through the data itself. This is a method that Jeong (2009) calls phenomenologist grounded theory analysis. It will hopefully give a better chance of finding explanations and understandings of the problem within the data itself and not just based on theory. This means that we might find new problems or underlying contexts that are not found in the theoretical framework.

In this thesis the grounded analysis is conducted in a "along the way" approach, meaning that as data is gathered, codes are found before all of the interviews are conducted. Once all of the interviews were conducted, all of the codes were reviewed again before applying them to certain categories. These categories were reviewed by both authors to ensure that the codes were not misplaced into the wrong categories and that none of the codes or categories were unnecessary or irrelevant to the study. Finally, these categories were grouped into themes. After the process was done, all of the codes, categories and themes were reviewed in order to ensure that they all make sense and that the pattern could be followed without unclear paths through the process. These themes where then the basis of the analysis when trying to answer the main research questions.

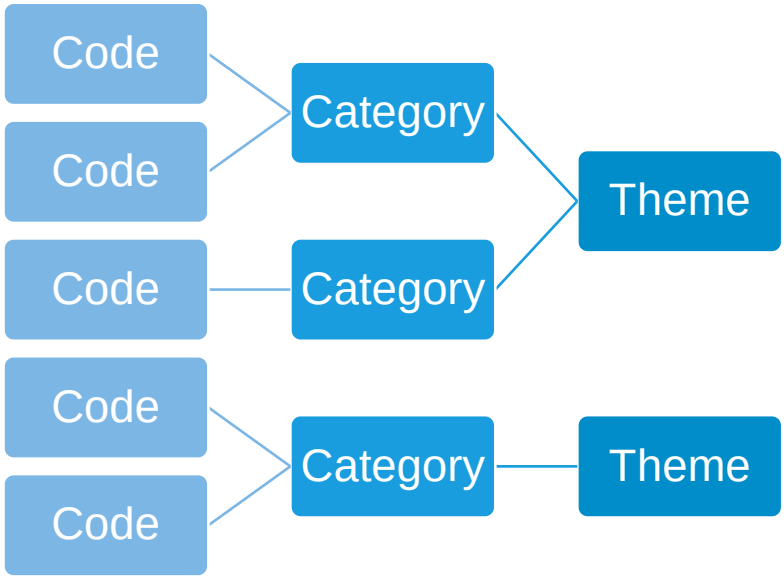

Figure 3.2 - Example of the theming process used in this thesis

3.5 Quality

Flick (2007) identifies four levels of asking the questions of quality. Since two of these relate to external funding and publishers, and this is a student thesis without any funding institutions or external publishers in mind, we focus more on the remaining two questions. The first is our own interest as researchers to know how good or bad our own research is. How can we find out if we did a good

interview or how far we can trust our findings? This also includes thought about the concepts of originality and novelty. The second question is asked regarding the readers' interest in what research they can rely on and what they can't rely on. This means that the research must be seen as trustworthy and there should be a possibility to check the sources and gain access to the references. This is something the reader will want to do themselves, as they themselves want to check if the research is reliable for their own purposes.

These two questions can be linked back to Guba's (1981) four criteria of credibility, transferability, dependability and confirmability. Descriptions of these criteria can be found under their respective headlines.

3.5.1 Credibility

Credibility is the "truth value", meaning that the presented data needs credibility in order to be plausible. Some ways to increase credibility of a report include member-checks, triangulation and extensive investigation in order to really exhaust an area of information. The credibility in this report is increased by having both thesis partners participating in the data gathering as well as peer-reviews during the thesis process. However, difficulties to find suitable interview candidates and the short process time limit the credibility to some degree in this thesis.

3.5.2 Transferability

Transferability, or applicability, means that the results should be able to be transferred to use in another case or at least be relevant for other studies. If a certain condition can be met, the findings should have relevance in any context. In order increase transferability of our results we have decided to leave as much technical or constructional variables as possible out of the final results. This brings the problem back to marketing in general, which is a much wider perspective. However since the case is very unique and specific, there are still some limits regarding the transferability of this work.

3.5.3 Dependability

Dependability means that in order to produce a good thesis, the work needs to produce stable results, meaning the thesis need to be consistent. This implies that the study follows one path from start to finish with a clear route between objectives. It also means that the researcher actually study what they said they would set out to do and that the research questions are in some way answered. However dependability also means that if someone else do the same study with the same data and the same method, they should arrive at the same results. For this thesis, this is done by carefully describing the work process and gathering data from people with different experiences and perspectives. However the study

is still limited to Sweden and results could fluctuate a bit if the study is conducted elsewhere.

3.5.4 Confirmability

Confirmability is the neutrality aspect of the thesis. It measures how neutral and objective the researcher have been when conducting the study. A high confirmability means that the research is done with impartiality and an unbiased view. This implies that if someone were to check the work, they would be able to find the references and data without considering the bias of the author. This also means that the research is open to public scrutiny and replicable. For this work, confirmability is increased by including both members in the data gathering as well as having peers review the work as it proceeds. Although the confirmability is still a bit limited due to some ethical considerations, such as privacy, anonymity and confidentiality.

3.6 Ethics

As research activity increase, there is also an increase in attention to ethics (Anastas, 2013). In business, ethical considerations are usually divided in two parts; the ones that protect the individual participants and the one protecting the integrity of the field (Easterby-Smith et al., 2015). Ethical relativism is also a discussed topic in which ethical subjectivism is gives a certain problem as it is a view where when considering whether an act is right or wrong in a given situation is determined by if the actor performing the act believes if the act is right or wrong (Whitbeck, 2011). This gives a moral problem which only considers our own views of what is right or wrong. We are therefore aware of that this limits the responses from interview candidates, as we can only assume that these are their own interpretations and thoughts. Gregory (2003) Discuss morality as part of ethics, the way that we as humans interact with each other and that morality acts as a constraint for us to do better than we otherwise might have. He states that morality gives us good reasons to things one way rather than another and that the way we should behave is often influenced by what morality requires. Honesty and transparency therefore needs to be considered in order to avoid misinterpretation (Easterby-Smith et al., 2015). However it also includes the principle of consent. This is probably the most commonly discussed topic within ethics, as this regard research involving human beings. This implies that although transparency is needed, it goes both ways, since the people involved in the research needs to be informed that they are taking part in a study, and how their participation will affect the study (Gregory, 2003). Covert research where the participants are not even aware of that they are being studied is therefore considered highly immoral. Consent also means that people have the right to decide for themselves if they want to take part in the research (Gregory, 2003). The principle of consent is adhered to when working on this thesis by first asking the participants if they are

willing to participate and providing them with the full information on what the study is about and what is being investigated. When the thesis is concluded, the participants will also receive the final version of the paper, so that they can see their contribution and how their information was used.

Confidentiality is another important moral issue when conducting a study in co-operation with other people. However it is important to remember that someone might consent to the research regardless of whether they get confidentiality or not (Gregory, 2003). Confidentiality have to do with the privacy of the people taking part in the research. Some people may be happy to leave their name in the final thesis for the public to see, but many people prefer to stay anonymous (Gregory, 2003). In this thesis, the confidentiality and privacy of the participants is dealt with by assuming full confidentiality unless someone say otherwise and agree to leave their name in the final report.

As this thesis to some extent study engineering aspects, there are a few additional ethical standpoint that are usually covered in engineering ethics which need discussing. Whitbeck (2011) mention three different criteria that judges an act in engineering as right or wrong. These are the nature of the act (respect rights or fulfil duties), the circumstance surrounding the act and the motives for committing the act. An example of an ethical code in engineering is that you are not allowed to pay or accept bribes, which differs a bit from for example the codes for medicine, where such a code does not exist, even though some other payments are identified as improper (Whitbeck, 2011). It is important to differentiate these codes from general ethics however, as it is of course no more ethically acceptable for professionals within medicine than for engineers to accept bribes (Whitbeck, 2011). It is therefore good to remember that the ethical codes for different professions serve more as guidelines than actual ethical “law”. Since the society may fail to support the responsible actions of engineers, the general public have a high interest in fostering these kinds of guidelines with legal support (Whitbeck, 2011). For the work in this thesis, it means that the authors take into account the right of customers to, for example not follow an eventual advice on using CLT for construction as well as recognizing that the participating engineers are aware of that they alone are responsible for what they say. This second point is therefore very important when considering the confidential standpoints in ethics.

4 Results

This chapter presents the different interviews that were conducted in the study. The interview candidates consists of a mix between a producer, contractors, architects and housing developers.

4.1 Interview with a Producer of CLT

The producer is today Sweden's only producer of CLT. They started producing CLT in the mid to late 1990s with the goal of having timber structures replace, or at the very least compete with concrete structures. As producers, they have not witnessed any rapid growth in demand until the last two or three years, with this year being the biggest increase yet, where they have tripled their capacity, of which all is already fully booked. The company also offer entrepreneurial services in which they do not only deliver the prefabricated elements, but also erect the building as well. They have previously done this with the help from a montage system with weather protection. This method has been effective but expensive, which is why they are now working more with semi-prefabricated solutions. The company can deliver entire, finished, full-feature wall and floor elements, but this is again depending on a working weather protection system is in place at the construction site. The respondent say that even though the material probably could be used when constructing buildings up to twenty storeys, they are not aiming to compete in the race of who can build the tallest timber building. They have calculated on taller buildings, but their main focus for now is on eight to ten storey buildings, with a future goal being to be able to deliver buildings of twelve to fourteen storeys.

> *"We are not aiming to compete for who can build the tallest building out of wood, we leave that to other companies."*

The respondent believes that the most important factor to focus on regarding the advantages with CLT compared to concrete is that it is environmentally friendly. That the constructions workers don't need to do as heavy lifts, a lighter finished building and that wood gives a nice interior climate is also considered important advantages compared to concrete, but the environmental-friendliness is the most significant factor.

> *"Environmental friendly, that's the big factor. Less heavy lifts, lighter building and nice interior climate are also considerable advantages, but the important factor is environmental-friendliness."*

> *"If you want to build environmentally friendly, you need to build with timber, not concrete or steel, that is a fact."*

They say that the main disadvantage with the material compared to concrete is noise. Since wood is much lighter than concrete and lighter constructions have a worse resistance to sound travel. There have of course been speculations about fire, but the material have passed all security tests and the company says that this is not the main concern for them anymore. The respondent believes the main reason that CLT have not seen a higher increase in demand is insecurity, probably caused by lack of information and that the main reason for scepticism is tradition. Working with CLT requires a bit of re-think comparing to concrete. It is not more difficult for the construction workers to work with than concrete, but the projection and planning phases look different. Since people are used to work with concrete, the respondent therefore believe that a lot of people don't choose to work with CLT simply because they are not familiar with it.

> *"Tradition, that's the main reason I think many people don't consider the material."*

> *"If you've worked in a certain way for years on end, you will get used to do things a certain way, and continue to work that way out of comfort. It's a bit like if you go to the mountains to do slalom and always rent skis. You will continue to rent skis, even though you know snowboard works just as well. The only reason you would rent a snowboard instead is if you've caught particular interest in it and specifically set out to learn it."*

Finally, the respondent believes that the reason the material have now seen an increased use is that the information have finally reached out and people are starting to see the ease of which bigger wooden constructions can be erected.

4.2 Interview with Contractor

The respondent say that the company started using CLT when the owners were looking for a new, more environmentally friendly material for their slabs. They found CLT and started a journey to develop new techniques over the years in order to meet demands and requirements. They have continued to use CLT in their projects up to this day and they still have a strong belief in the product. The respondent states that the main reason for sticking to CLT is because they want to stay ahead of both the competition and the carbon dioxide questions and regulations that are becoming more and more common in environmental buildings. The problem they experienced when switching from concrete to CLT was that there were no known way or techniques on how to work with the product, meaning that they have had to develop their own techniques on how to work with the product. However, this also meant that they have been able to adapt to one of the strengths of the product, which is the customizability. If there is something that needs to be changed, it's easily done. The respondent also say that there could be an issue with the customer, who can often be concerned about a wooden

interior surface and sometimes need to get used to the material first, before they can get convinced.

> *"People are often used to have a smooth, flat surface. Often in white. The wooden surface takes a bit more getting used to, since it's a more rough material with a bit more brown and yellow colours. Some people feel like it's a bit like a forest cabin."*

However, the society is getting more used to the material and their customers are generally very happy with the finished building. They are then starting to see the advantage with the product. Finally, there's also the regulations for construction to take into consideration. The rules in BBR and PBL needs to be followed and constant thought must be put into how to work with the product in order to meet all the demands. However, the respondent believe that the product have many advantages, among which is the speed that the buildings can be erected.

> *"If I say that I can erect the same building for the same costs, but much faster than the guy who offer it in concrete, that's a big selling point I think."*

The main advantage with the product however, is that it's environmentally friendly, the respondent says. This is an area where city planning and government policies come in to play as well and the respondent believe that in the future we will only see more demand for regulations regarding carbon dioxide footprints. They think that this will reflect in everything we do, such as buildings, cars, food etc. The main influence of what materials are used in the construction lies on the customer. Architects also have a say, but they are according to the respondent usually easy to convince, but they first need to learn how to work with the product and use it efficiently. The customer is however the one paying for the project, which means that they often have the final say regardless. Until now, most of the customers are people and companies who are interested in environmentalism and want something special.

> *"Many of the customers who ask for CLT want to stand out and make a statement – they believe in environmentalism."*

The company have no set requirements for the products they use. These are more based on the demands of the customers, which are then used as a guideline when planning the project. This results in that they don't use many standardized products. The respondent think that the main reason that CLT have now become a hot topic in construction is the environmental aspects. It is also a nice material to be around and it enables lightweight constructions, which can make it easier to erect buildings on tricky plots. At least in Sweden, the speed of which the building can be erected compared to concrete have also caught peoples' attention. The main reason for some companies still being sceptical to the product, especially if they are a major actor in concrete construction, is simply to protect

their brand, the respondent says. Some of the scepticism is also up to the uncertainty. Since the product have not been available that long yet, there is very little record and statistics about problems and capabilities. Time will still have to tell how long the buildings will last and how much they can withstand, and this the respondent believes can put off some people from using CLT.

> *"Everyone is scared when they see something new. Concrete have been around for ages and people have learned to trust it. CLT have not had enough time yet."*

4.3 Interview with Housing Developer

The company started in 2009 based on an idea that the respondent had on the belief that wood gives a very nice interior. In the end of the 1990's, the respondent participated in a course about CLT, which was the start of creating this idea of creating prefabricated, but still architect-drawn houses. The respondent then started to make contact with a producer of the product, discussing the idea, which they really liked. This started the partnership that they've had up to this day with the producer. The goal being to become the biggest CLT housing manufacturer in Sweden. To achieve this goal they have worked very hard with their brand. They started out with smaller cabins, but later moved on to making bigger houses as well. The respondent says that the environmental aspects are important when marketing this kind of house, but the interior environment is also very important.

> *"I know a lot about wood from before, so it was a natural choice for me."*

> *"Wood gives a very nice interior environment, so this is the main idea that we base the marketing on. But you can of course not forget the environmental advantages."*

The most difficult thing that you have to work with when planning with CLT is the installations. This is however just a minor problem for the company since they only work on single family housing, meaning that they can have all the installations against the exterior walls. Other possible problems that the respondent mentioned included sound, but again since they only produce single family housing, this is not a major problem for their company. One other thing to remember is that you have to optimize element sizes after the material, and if you have a big opening you need some complementing structural support, since there are no beams or trusses. The respondent believes that the main reason for public interest for the material is partially because it's existed for nearly twenty years now and it's starting to become a normal part of the market. She also thinks that architects may want to start sooner, but up to now there have been very few building companies that's been interested in using the material outside of the ones that really focus on it.

"Architects were probably interested of starting to use it earlier, but there were very little knowledge and access to the material."

She also says that their company have contributed to increase the interest in CLT, especially in the prefabricated housing market. Together with the other leading companies using CLT, it has contributed to an increased interest from the public as a whole. However, it have led to the problem that material is now hard to come by because of production of CLT not being able to satisfy the demand in time, creating queues for getting it. The main reason for scepticism probably comes from the difficulty for construction companies to switch their methods and way of working. That's a big initial cost which many companies are not prepared to pay, unless there is a particular interest for the product. The respondent also says that part of the doubt can be because it's a new material and not many buildings exist yet, so there is no massive proof of concept yet as far as quality and reliability is concerned.

"By not being willing to change, it results in them working against the material. They don't dare to try before other people have had a go."

4.4 Interview with Housing Developer

"Environmental of course."

This was the answer we got from the respondents when we asked for the main reason they had for choosing CLT for their current project. They said that they felt that they have to do everything they can to save the environment, but they also wanted to prove to others that they can do it. The project started as an open competition in the municipality and the respondent thinks that a big part of the reason that they won was due to the environmental factor. But it was probably also because of the design. The respondent told us that at the time they didn't even know if it was actually possible yet. They were partially right, because due to the shape and function of the building, foundations had to be made from concrete, and while the rest of the building is wood it's not all CLT, but apartment dividing walls are made from traditional truss work for better sound insulation. The respondent say that neither contractors nor architects that worked on the project have any previous experience working with bigger timber projects, so there was a bit of a learning curve for two weeks, but afterwards everything worked perfectly. Fire safety and moisture have also been a concern during the project. Fire engineers have looked at the project and seen that it should work, but they are still a bit sceptical. This also affects the insurance companies. There have been CLT high rises built before in Sweden, but the insurance companies are still unsure if it will work, but the respondents are still determined that it can be done.

"Then we said to ourselves that we will prove it possible."

In attempt to improve the aforementioned issues, the building incorporates a lot of safety technology to prevent the spreading of fire, such as sprinklers, electricity cut-offs and more. In doing this, they have achieved all the requirements set by BBR. A lot of thought and attention have also gone into details and staff education.

"Details are very, very important."

There are however a number of advantages with CLT that the respondent pointed towards. One of these was that the workers really like the material, since the building site is less noisy with a lot less dust generation than on a concrete building. The material is also very light, meaning less heavy lifts and that the cranes can lift more elements at a time, which significantly speeds up the work.

"With concrete you can lift one or two, here it's like ten."

The respondents believe that if you really worked with the material, you could probably halve the building times compared to a concrete building. They say that research conducted at the nearby University also points towards that you feel better when you live in a wooden house. The wooden construction was mainly pushed by owners and part owners of the company who got information about it from other companies they also hold shares for. They also think that it will serve them well long term, since they are not selling the building, but are instead keeping it and will provide the service themselves. However the project is still expensive due to the unique design as well as the high standards aimed for. The company aim for a near-zero energy certificate as well as a silver certificate in regard to environmental aspects. They also follow the Sunda Hus recommendations of what materials to use, and know exactly what materials are put into the construction and where they are located. The respondent think that a lot of the reasons for CLT being such a hot topic right now has to do with the environmental aspects of wooden buildings. This is a way that companies market themselves. They associate their brand name with wooden constructions. The respondent says that this seems to be working, since they've had a lot of interest from future tenants and that they had three hundred people interested in renting one of the apartments because of the wooden construction.

"I think it (interest) will grow, especially from younger people."

However they mentioned that in order to keep the good reputation, the issues of the material needs to be sorted out before there is a big problem. The main scepticism to the material is probably due to the workers being used to concrete. Thinking in concrete is easier because you're used to it. This is often more of a problem with the older workers. The younger ones often say that from now on, they don't want to work with anything other than wood.

"You just think concrete."

"They say: I like wood, but concrete would still be easier."

4.5 Interview with Contractor

This interview was the first one where political questions where discussed, as the reason for the contractor using CLT was simply because the municipality decided that you had to build with wood on that plot. The respondent says that given the choice they would definitely have chosen to do the project in concrete instead. His reasoning being that CLT is expensive and sound and fire insulation is a constant problem when working with wood. Due to the political issues and policies having a big influence on choice of material in that city, the techniques must be developed in order to still be able to follow the rules and regulations for construction. The respondent also has doubt in the material when it comes to taller buildings.

"I think that we may see a lot of problems in about ten years."

Moisture might also be a problem, probably increasing as you add more storeys. According to the respondent there are still many insecurities with the material as wood moves a bit in the construction. The customers might also not understand these technical things and therefore be afraid or hesitant to use the material. There is also a need for education in order to be able to work with the material. Due to regulations that have to be followed and that some of the requirements in different areas can be tricky to achieve with wooden constructions, the projects can turn out to be very expensive. The respondent pointed out three things that can be particularly problematic.

"Three things: connections, fire, sound."

The respondent also agrees that there are benefits to working with CLT though. Wood as a material is very easy to work with and compared to steel, it could actually be easier to work with in regard to fire. It is also easy to fix mistakes and the material is very light. However the respondent stands firm that political decisions about what materials to use is not good, and that the engineers should instead have the free choice of choosing a material that works best for that particular project. He says that we still don't have enough statistics about the material yet and we don't know how well it will hold in the future.

"I put responsibility on politicians."

The respondent also think that the producers should take more responsibility for fire and sound problems, and he also believe that some standardization of connections is needed. These things are needed to increase the market share of CLT even further. Although the material is light, there is also a problem with the foundations since more loadbearing elements are needed, which means that the

foundations can be more expensive. The reason for CLT being in the spotlight in construction discussions are the environmental aspects and the political questions that cover this topic. However the respondent says that, since it's still wood, it makes people sceptical if they don't know how the product work technically. There are also the extra costs for weather protection tents and more. However this increase the quality of the working environment. Finally the respondent says that if CLT is to gain more market share, the producers need to sort out the problems in order to gain more faith in the product.

4.6 Interview with architect

The architect company have as a vision to design more sustainable projects. Wood contributes with binding carbon dioxide, but the respondent points out that for this to work, the forests must also be taken care of in a sustainable way. Wood also have aesthetic advantages and the prefabricated nature of CLT lowers the amount of transports required. However the respondent says that everything should not be built from wood, but they also say that there is definitely room for more wooden constructions.

> *"That which can be built with wood, should be built with wood."*

CLT have its problems for architects though, since the short span limits the plan. The insulation part in the wall is also bigger, meaning the walls are thicker, resulting in a bigger, "dead", unusable area. The measurements for prefabrication also limits the possibilities in planning. The respondent said that even though the architects are not involved in the technical parts of the projects, they still have to take fire and acoustics into consideration. The most important advantages with CLT is that it's sustainable, a light material and that it's fast to build with compared to concrete. The material selection often start from suggestions that can come to the architect from customers or contractors. Depending on what kind of project is done, there could be a dialogue between the architect and customer or contractors. The respondent also states that sometimes the contractors just choose materials without hearing the architect's suggestion.

> *"Sometimes contractors can choose concrete out of comfort."*

However, the customer always has the final decision. The architect company in question have no clear policy regarding use of materials, but they have ambitions to produce climate-neutral projects. The respondent believes that the main reason for CLT getting more attention is that the information have finally reached out and that it's become part of the political discussions in environmentalism. The material is also getting more economically viable and even faster to build with, compared to concrete.

> *"I believe that it's a combination of the environmental aspect and the need to complete more projects quicker."*

However, the respondent said that people are hesitant to use CLT because they don't know how to work with it. There is also the insurance and fire issues. And finally the contractors are also a bit concerned about the moisture and that working with weather protection seems complicated. A lot of the decisions taken is due to monetary causes and the producers of CLT are still limited. This means that competition between them is not that fierce, which in turn mean that the prices are still kept quite high.

"It's always about the money."

4.7 Summary of empirical material

The gathered material is from quite a lot of varying sources. There is input from most of the actors within the construction business, everything from a producer of CLT to housing developers that will continue to rent out apartments in the finished building. However, despite their differences in focus and activities, they all seem to point towards roughly the same interests, aspects and discussions about CLT, and even though most of the respondents advocate the material, there is also one respondent who is still sceptic towards using it. When asked what the advantages and reasons for choosing CLT is, all of the respondents said, in one way or another, that it's mostly the environmental aspects of wooden construction that stands out as the key factor. A lot of them also points out the lightness of wood and that it's a nice and easy material to work with, with the architects focusing more towards that wood gives a nice interior climate. Many respondents also mention the speed of which it's possible to erect a building with using CLT. The main problems with CLT that most people pointed out is the fire and sound insulation along with some concern for moisture. There is also the question of how to work with the material that rules high when planning projects, especially among the contractors. Most of them were hesitant at first, but once they learned how to work with the material, they all found it nice and easy to handle. This uncertainty is mentioned by a number of respondents and some of them say that this could lead them to choose a concrete construction out of comfort. None of the respondents mention special requirement for materials to fulfil in order to be used by their companies, but the solution is simply tailored for the project at hand. However, there were a few respondents that mentioned that although they didn't have any standards for the materials to fulfil, it would be good if the requirements for fire and sound could be met with help from improvement of the product. There is also one aspect that all the respondents point out as a key factor, and that is the costs. Money is a big factor when it comes to the different construction projects and CLT is still an expensive solution. The ones that have used the material either did it because of external pressure, out of own interest as a way of marketing themselves, or that they see it as a long time investment.

5 Analysis

In this chapter, codes have been found in the empirical results. These are then classified into different categories and themes.

5.1 Grounded analysis

The interviews were coded after the interviews were concluded and to start with thirty codes were identified, but one was eliminated, due to it being roughly the same as another, bringing the total down to twenty nine. These codes where then examined and we found that they could be categorized into six groups; *technical problems, disadvantages, advantages, benefits, external problems and incentives*. These groups where then reviewed and some of the codes where moved from one category to another, making sure that each category included all the relevant codes. Finally, these categories were grouped into three themes, with two categories in each theme. These themes are problems, marketing points and influences. A hierarchy of the themes and the categories can be seen below. Since there are many codes, these are not displayed in this figure, but a full figure of the coding can be found in the appendix.

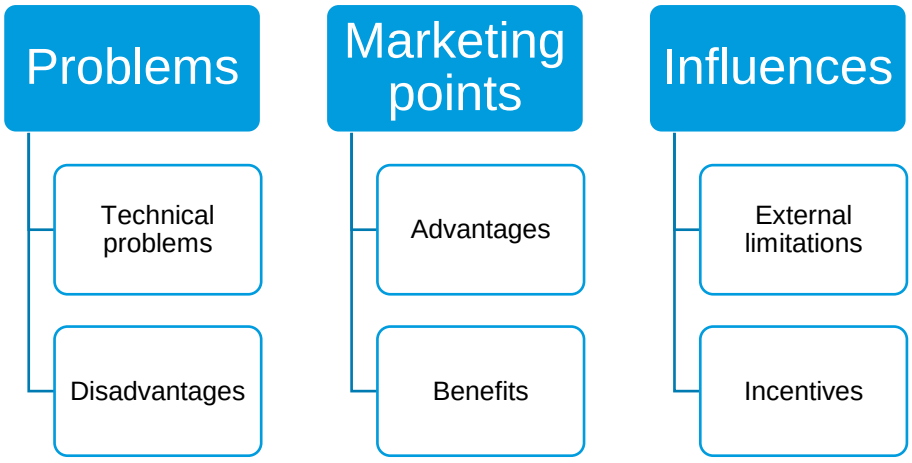

Figure 5.1 - Hierarchy of categories and themes.

Each of the themes are also described in more detail under the respective headlines, along with the corresponding categories and the codes that belong to them. The different codes were classified into the six categories in figure 5.1 (technical problems, disadvantages, advantages, benefits, external limitations and incentives). These categories were derived by looking at CLT from different levels and perspectives. The categories (and by extensions the codes underneath them) below the problems and marketing points themes are directly related to the product, where technical problems and benefits are connected to the aspects of the material itself, and the disadvantages and advantages are when you compare the product to its competitors (in this case concrete and steel). The

categories and their codes under the influences theme are derived from applying a wider perspective and look at CLT from a "world" point of view. This includes all of the aspects not directly related to CLT, but things that affect, or are affected by CLT. This includes external stakeholders, companies or other things that may limit the product as well as incentives to choose it as a construction material.

5.1.1 Theme 1 – Problems

From the interviews, it became clear that the problems are made up of two categories; the technical problems of the product itself and the disadvantages compared to other products when using it. The technical problems for CLT includes the problems connected to the wooden material, namely noise, fire and moisture insulations mentioned by many of the respondents. Some respondents also brought up the problem that, since the walls and slabs are thicker due to thicker insulation, they take up more space, resulting in that less of the building area can actually be used. Finally, the connections between elements are not yet standardized and many have to be custom made to fit the specific project at hand. This was especially pointed out by the more sceptical respondent. The disadvantages of the product are things that are not necessarily related to the product itself, but due to other problems you face when using CLT, such as the costs, which most of the interview respondents said was the main concern, but they still felt that it could be justified. The product itself doesn't cost substantially more than concrete or steel, but since more material is needed and special solutions need to be made in order to meet regulations, the final costs usually ends up being higher than the competing concrete solutions. The need to re-think how to work with the material and the extensive planning needed before the construction actually start is also a disadvantage, where some respondents mentioned the extended planning phase and the one or two week learning phase once construction starts. The prefabricated nature of the material also limits the different sizes of the elements and forces companies to carefully plan installations in advance. The architects and engineers therefore need to be educated on how to work with this product in order to fully utilize it. In the case of CLT, this seems to work pretty well, and from the interviews it's clear that many of the consumers are involved in the innovation process of the product in the way that Hoogma & Schot (2001) describes.

The problems are the main direct negative points of using the product. These are usually the ones that people opposing the material mention to convince others to stay away from the product or when they are asked why they don't like it. It seems that some of the interview respondents are aware of this, although they sometimes see it as people just protecting their concrete brand. This makes it a bit hard to determine how they really view the product, which according to Armstrong & Kotler (2013) is important, since people's feelings about the product may be as important as the actual performance (Cooney, n.d.). However these

problems are just the things that are visible on the surface - the tip of the iceberg. It's clear from the interviews that there are still things that the producers needs to fix in order to win over more customers though. The most important problem to take in mind here are probably the costs, since costs seems to be at the centre of most discussions if someone wants to build with CLT or not. But as Luet al. (2013) and Ottman (2011) states, it does not matter too much if there is a higher cost, as long as it is justifiable.

5.1.2 Theme 2 – Marketing Points

The marketing points include the direct, technical advantages with the product compared to concrete, as well as other benefits received when using CLT. The technical properties of CLT makes it an easy material to work with compared to concrete as well as the prefabricated nature of the product makes it much faster to erect buildings. Wood is also a very light material (Brandner et al., 2016), meaning more elements can be transported and lifted at the same time, further decreasing build time, but also reducing load on the rest of the construction. This was mentioned as a favourable property by many of the interview respondents. The other benefits of CLT is the ease of which changes can be made on site and the compared to concrete excellent working conditions – not only on site since noise and dust levels are substantially lower, but also since it's a prefabricated material, ergonomics and climate level is a lot better due to the product being manufactured in a factory and not shaped so much on site. This was also mentioned by a lot of the respondents. Another benefit is the nice interior climate that the wooden elements give. This is probably more subjective, since it involves some degree of aesthetics, but according to some of the interview respondents, it seems that most people feel that it is nicer to live in a wooden house, and the public interest in living in the buildings made by several of the respondents seems to prove this theory.

These things could probably be enough to sell the concept of a CLT building, but the big selling point for this product seems to be that it's environmentally friendly. This is a fact that was mentioned as a top reason by all respondents, regardless of profession and view of the product, which confirms the findings of Ottman (2011), that people are interested in environmental benefits. It's therefore no surprise that the people speaking for increased use of CLT mostly focus on these environmental aspects. In fact, they may have done so as much as to almost overshadow the other benefits of using the material, since other people not experienced with the product don't seem to know much else about it, and as Lu et al. (2013) points out, people will not sacrifice functionality just for environmentalism. Therefore they could hesitate, since they will not know that there are functional benefits as well as the environmental ones. It is therefore important to spread the full information on the product and not just focus on environmentalism.

5.1.3 Theme 3 – Influences

The influences theme consists of external problems or incentives mentioned in the interviews. These can either hinder or encourage the use of CLT. These can be directly related to the characteristics of the product or simply some reasons to why it is or is not used. A more direct external problem is the weather, as mentioned especially by the producer respondent. When working with wood, you often need some kind of weather protection. This also gives the benefit of better working conditions, but it can be tricky to solve and therefore potentially make the project more expensive. According to many of the respondents, the product takes some getting used to before being comfortable working with it and be able to build at the speed that is theoretically possible. The more indirect external problems include political policies (as mentioned in particular in one of the interviews), lack of information, tradition, "concrete-heavy" companies trying to protect their brand, customer decisions, uncertainty and the difficulty to get insurance for the finished buildings. The political discussion are always something that can intervene with a products success or failure on the market. In the case of CLT, it's not been such a big hindrance, but more of a concern among some contractors, where they feel that the decision of what materials should be used, should not be made for political reasons, but the engineers should have the responsibility to choose the best material for each project, which coheres with the findings of Samli (2016). The lack of information seems to be a bigger problem, especially according to the producers themselves. A lot of the respondents, including the producer believes that this is the main reason that the product have not seen a bigger increase in market share until recently, which coheres with the findings of Joshi & Sharma (2004). However there is also the problem of tradition and companies trying to protect their brand. This is more related to companies, even though they know of the product, either not use it out of comfort or disregard it just to protect their own brand of concrete buildings. It could also be because of the traditionally conservative views that the industry have according to Gambatese & Hallowell (2011). These views could also lead to some increased resistance from the public, especially if the companies are bigger reputable brands. It could therefore lead to the customer turning away from the innovative wooden material and instead opting for the traditional concrete construction, and according to the contractors and architects that we interviewed, the customer always have the final word when it comes to making big decisions about the project. The uncertainty of the product could also put off some potential customers, as not enough statistics for buildings with CLT exists yet. This is also off-putting for the insurance companies, since they base their quotes on a lot of statistics. Many of the respondents therefore feel that getting these buildings properly insured can be hard.

In order to balance these external discouragements there needs to be some encouraging incentives. The aspiration to stay ahead of the competition, the

interest of customers seeking something exclusive or different as well as the environmental incentives are the incentives most commonly mentioned by the respondents. Up till now, the companies focusing more heavily on CLT have done so to stay ahead of the competition. This is a way for them to market themselves as innovative and interesting. This in turn has attracted customers that are looking for something a bit more exclusive, or are more aware of what materials go in to the project. This directly links up to the environmental incentives for choosing wood as a construction material. These environmental arguments have therefore been a big part of the marketing strategy for these companies as well as the customers' main reason for choosing them. This goes in line with the findings of Peattie and Charter (2003) that green marketing is really a relevant way of marketing a product, and Noppers et al. (2014)'s findings that people are willing to adapt innovation if there are environmental benefits. If there is one word that have dominated the interviews when talking about CLT and the incentives to use it, it is "environmentally-friendly".

5.2 Reflection to the industry

These results seem to go in line with what we have already come to expect from the often traditional/conservative (Dubois & Gadde, 2002; Blaise & Manley, 2004) construction industry. There are always some "front runners" that will embrace new materials and try new ways of working, and the companies that are not interested in radical innovation usually don't give it a second thought. This was confirmed for this study when interview candidates were searched for, as people that hadn't worked with CLT before didn't even show any interest in it when we mentioned the advantages of working with it.

5.3 Environmentalism vs Money

As expected, there were a lot of discussion in the interviews about the environment and that the construction industry is one of the major contributors of waste and damage to the environment. The people that had used CLT all made it clear that this is actually an important reason for choosing CLT. However there is currently a price to be paid for this environmentalism, and many companies and customers are simply not willing to pay the premium. This may well be, as Lu et al. (2013) describes, that they don't feel that there are enough functional benefits beyond the environmental ones. This brings us to the proven fact that, in the end, money is the deciding factor. The big question here is; how much are customers and companies willing to pay extra in order to "save the environment", as discussed by Peattie & Charter (2003) and Lu et al. (2013). Some people obviously think that the current price is worth it, but for how long will they hold on, and what will they say if the price increase even further? Maybe the answer could be found if we look at another industry. The car market, as studied by Noppers et al. (2014) have had so-called environmentally friendly options in the

form of electric cars for about the same time as CLT, but since cars are fast to produce in big numbers, they are more common on the road compared to CLT buildings in the cities. These cars, just as CLT buildings have often come with a price premium, but customers are still plenty enough to keep making the cars. The electric car customers, just as the CLT customers, have been willing to pay the premium price to make an environmental statement, which confirms the findings of Ottman (2011). They have, just as the companies working with CLT, been willing to make sacrifices in other areas as well, such as range and charging time. The car manufacturers also seem to know that if you want to charge a higher price for the product, it needs to have an exclusive feel and contain the latest technology, which adheres with what Lu et al. (2013) describes. Therefore it is important for the producers of CLT, and the people designing the buildings to design a product with a high quality feel that is attractive to people, without mentioning the environmental aspects. Because if the only thing you sell is environmentalism and nothing else, then customers will, according to Lu et al. (2013), probably stop paying if there is no other beneficial qualities, especially if the price increase. Therefore it is important for the people advocating CLT to not get blinded by the environmental aspects, but also, as Joshi & Sharma (2004) states, provide information, and highlight the other benefits of the product.

6 Conclusions

This chapter links the analysis back to the original research purpose and questions, in order to answer the questions.

The purpose of this thesis was to find out how CLT could be marketed towards a previously inaccessible market that have opened up because of legal or technical changes and/or development. We looked at the timber construction industry and how CLT has developed and been used over the years and what problems it faced along the way, to be able to find some hints on what has gone bad, or what has been a success. We also investigated if there is any special key factors needed in order for CLT to be successful. Since CLT is a more environmentally friendly product than its competitors, concrete and steel, we also looked at "green marketing", to see if there is any advantage that can be gained in this area.

6.1 Research question 1

"What difficulties has CLT faced along the way and why hasn't it seen a strong growth until recently?"

The product have faced numerous challenges since the first appearance on the market. Most of which, according to many of the interview respondents, have come from the different rules and regulations that surround construction. The biggest problems here have not been the structural integrity of the material, but more related to its characteristics when it comes to sound, fire and moisture insulation. Moisture is, according to the producer, solved while fire remains a bit questionable and the sound is at the moment the most problematic aspect to deal with according to most respondents. The technical problems have not been the only problems though. Since there are no statistics on CLT buildings yet, insurance is hard to get and a lot of people are sceptical to the performance of the product, or even still unaware of it. This became apparent when trying to find respondents for the interviews, where all of the people contacted who did not have any previous experience of CLT were not at all interested in taking part. This is also partly due to the lack of information, which until very recently have been present. In turn, this is the reason for the sales not increasing until recently.

6.2 Research question 2

"Is there a key factor that could contribute to CLT seeing increased use?"

It seems from looking at the results, that there is no set "recipe" for a successful product in construction in general, more than that it should be able to pass the regulations and not contain any dangerous material. There is however some guiding aspects to the products in this industry, such as that the product should not only function on its own, but it also need to be flexible, working good in

numerous different situations and being changeable to fit whatever purpose is set for the project. CLT seems to pass these criteria, since it's easy to work with and changes can be made quickly. There is a problem with the structural flexibility though, since floor spans can't be as big as on concrete buildings and the prefabrication process somewhat limits the plan design. However, from the interviews it seems like, that although the customers don't possess that much knowledge of how to use the material from before, as discussed by Joshi & Sharma (2004), the producers of the material are willing to involve them in the development of new working methods and solutions. This is according to Hoogma & Schot (2001) favourable for a good development.

There is also one big factor that often have the final say, and that is the money. Many of the interview respondents say that monetary reasons will almost always weigh above everything else, which is why, if a product is to be successful in the construction industry (or probably any market for that matter), it needs to be economically viable, or that the costs at least can be justifiable. With CLT it seems to mostly be the latter that rules the decisions of customers and contractors alike. If the price is higher, there needs to be some other kind of incentive to use the product.

Even though the construction industry in general don't seem to have a single clear success factor, there are still ways for products to gain market success by incorporating some key benefits and advantages. For CLT, these factors seems to be mostly the environmental aspects of wood, but many of the respondents feel that things like the faster build time and nice interior are also major arguments for justifying the higher costs.

6.3 Research question 3

"How could CLT, when entering a previously inaccessible market, be marketed when people have a long-held idea that all products made from the same material is inferior, no matter how they are made?"

There are a few things that are important when marketing CLT. The first, and probably most crucial one is information. If the public and other companies have developed an idea that your product is inferior simply because of a material that you use, you need to inform and educate them on how your product works. This must be done in order to be able to prove to them, that all products of the same material does not necessarily have the same characteristics. Information is also needed in order for people to actually realise that your product exists and that it's actually a new product. The story of CLT has shown that if information does not reach out, people either don't know about the product at all, or just mistakes it for a different kind of working method. However, it is clear from the interviews that the producers closely collaborate with their customers to engage in learning

and developing as Hoogma & Schot (2001) suggest that you do when creating a new, complex product.

Another important thing to highlight is the benefits of the product. Not only the technical benefits from the materials used, but also the benefits gained while using it. As not only the construction industry, but other industries as well have proven, environmentalism is a strong marketing point (Noppers et al., 2014; Ottman, 2011) and if your product can be marketed as environmentally friendly, at least compared to the alternatives, it is a big advantage. From the interviews, it is also clear that focus could be put on how you use the product as well, for example the easy to work with, and make changes aspects that CLT inherit. Of course a strong performing product in terms of reliability and technical strength should be marketed with these things in mind, but it's clear from the interviews that the other factors should definitely not be overlooked.

Our impression of these kinds of situations from looking at CLT is that the first thing to do is to actually have a fully functioning product that can be sold and used. At least according to the one sceptical respondent we found, since they said that sorting out the technical problems would make them like the product a lot more. The second thing to do is to market it by spreading information. Information about the product, why it's different from other products of the same material and what advantages this leads to. Spreading information about the product, will not only increase the number of people that know about the product but also what advantages it possess in comparison to the competition (Ernst et al. 2010; Joshi & Sharma, 2004). People should then hopefully take interest and find out more about it, as well as trying it out for themselves. This is where the availability and price comes in to the picture. Producing companies need to be able keep the waiting times and prices down. Price premiums here don't seem as a too negative aspect, as long as they can be justified by the advantages (such as the environmental friendliness), but they cannot be put too high and they always need to be justifiable (Lu et al., 2013; Ottman 2011).

7 Discussion

The final chapter of the thesis. This includes a discussion on the conclusions from the previous chapters to try and widen the perspective and discuss how relevant it is to different industries. There is also a discussion about what future research is needed and what is still limiting this thesis.

7.1 Discussion of results

There has been quite a lot of talk about the uncertainty of CLT during the interviews. This is because these buildings have not even existed for twenty years yet and buildings are expected to last between fifty to a hundred years. This means that there is not that much statistics to rely on, which in turn, as some of the respondents confirmed, makes it difficult to get insurance for these buildings. The product is simply too new for it to be completely proven to stand up against all the challenges it will face over the years. This is something that the respondents view very differently when talking about it. The people who are enthusiastic about the product mention it more as a waiting time, where they can say that we simply have to let the years pass, and then the buildings that are built will prove to the rest that it's been a good material all along. This would then be in line with Bohlmann et al. (2010)'s views on early adopters. In this case the initial adopters want it to work so much that they almost assume that it works. On the other hand, the sceptical respondent, or even those with a more realistic view of things realise that there could potentially be problems that rise up over time. They are therefore more cautious with their words, even if they really want the product to work perfectly.

One thing that surprised us, was the little to no attention on the lumber industry itself. A lot of respondents talked enthusiastically about how good the product is for its environmental aspects, but only two of them mentioned anything about the importance of actually keeping the extraction of the material on a sustainable level. This is an aspect that is usually lacking in research about green marketing, and not integrating these topics feels a bit strange to us. The lumber industry itself, while providing an environmentally friendly material, may not be as good for the environment itself. Things such as transporting wood across the continent and what machines operate in the woodcutting and where the power comes from was never discussed on the interviews either, except with the producers themselves. Nor was the level of deforestation, which if not kept at a sustainable rate, could result in large masses of forest disappearing as the level of timber construction increase. Only one of the respondents mentioned this, which indicates that, although a lot of people are interested in the environmental aspects

of a product, they do not seem as concerned about how environmentally friendly the process of making it is.

Finally, there is the question about money. This is usually a deciding factor for anyone when selecting products, and it seems to be so here as well. However, the results also show that expensive costs could still be accepted, as long as there is a good trade-off on other qualities, which goes in line with Ottman (2011)'s findings. The people that up till now have paid the higher prices to use CLT have often done so for the environmental purposes as well as the other benefits. However this also seems to be a way of marketing themselves, which also coincide with Ottman (2011)'s findings. Many of these companies seem to be willing to pay the extra price in order to look advanced or exclusive, convincing the customers that it's worth the extra costs. This could change in the future though, as more CLT buildings are built and especially if the price or waiting time increase.

7.2 Limitations

As this thesis is done only with the construction industry as a reference point, and with a unique product situation, there is some limitations to how applicable this work is to other business areas and industries. Since the rules and regulations covering construction is very strict, there are also many other things that needs to be taken into consideration when using CLT. So even if the product itself adhere to the material specific rules, there are other rules. These are not directly aimed at the product, but still controls how it can be used as well as how other elements need to be designed. These kinds of regulations and needs for consideration does not exist in all industries or on all markets. Many times when a product is developed, as long as it is functional on its own or at least follows the general regulations, there is no need for considerations to be made other than the ones that directly considers the product properties themselves compared to its competitors.

The limited numbers of actual projects completed with CLT is also something that needs to be taken into consideration. This means that there is a low sample size of the product being used. Also, since buildings are built to last for at least fifty to a hundred years and the material have only been used for barely twenty years, it still have to stand the test of time. Because of this, there are also very limited statistics on how the product performs against things such as wear and fire.

7.3 Recommendations

In order to be able to sell products that have the same or similar background to CLT, our main recommendation is that you properly spread information about the material and its benefits. This is, just as Joshi & Sharma (2004) found, also in this case a must in order to get people to even have a chance to change their mind about the previously looked-down-upon material that make up the product,

along with realising that just because it's mainly made from the same material, it can have different characteristics. The producer and some of the respondents agrees that it's the lack of information which is the main reason for CLT not gaining much market share until recently. They also believe that the reason for the product finally seeing increased use is because the information have finally gotten out.

To deal with the sceptic people, the best thing to do is try to sort out the problems. This is something that a lot of the respondents mentioned, including the one that was sceptic. They said that if these problems could get sorted out, it would make him like the product a lot more. Sorting out these problems will take time though, which is why we recommend to focus on solving the most commonly mentioned issues, namely sound and fire. The problem with the insurance companies however will probably have to remain unsolved for a while, since they operate based on statistics, something that we can only get through the course of time.

Our final recommendation is to try not to increase, and if possible lower the costs of using CLT. This includes both the direct costs of the product itself, as well as all the indirect costs that come from working with it and from measures taken to pass regulations and demands. From the interviews it's proven time and time again that money is always going to be the ruling factor in the end, and this is the case for this product as well. However, the interviews have also proven that expensive costs can be made up for if gains are made elsewhere, which coincides with Ottman (2011)'s findings, but the gains have to be important to the customer, since they are the ones paying for the project. Although some customers are willing to pay a price premium for the product, more customers would probably be gained if the costs could be lowered.

7.4 Future research

Since the product have not been around for that long, there are still studies needed to be done on how it actually performs, along with gathering more statistics as time moves along. More studies on how the problems with the product can be solved need to be conducted. We recommend that the producers keep integrating the customers in the innovation process, as Hoogma & Schot (2001) describes. It would also be a good idea to keep looking into different ways of solving the weather protection problems and how to utilize the prefabrication to its fullest, in order to be able to erect buildings even faster.

In order to be able to increase the market share of CLT, there also need to be more, or bigger producers. This however, poses a question of how many can be sustained. Trees do not grow at the same rate that we cut them down and use up the material to make buildings, meaning there is a lot of effort needed to be put into forestry. Further research about how we can keep a sustainable forest

industry over a potential boom in wooden construction is therefore also needed, along with more integration of this topic in the green marketing research.

Finally, since CLT is such a unique example of where a product is created from a material previously viewed as inferior, or even dangerous, there need to be more studies conducted in other markets, where a product have also been made out of previously illegal or unsuitable materials in order to see what made it gain market share. The marketing points found in this thesis may or may not apply to other products in other markets, which is also why studies of other markets are required to tell what the selling points could be for products within that market.

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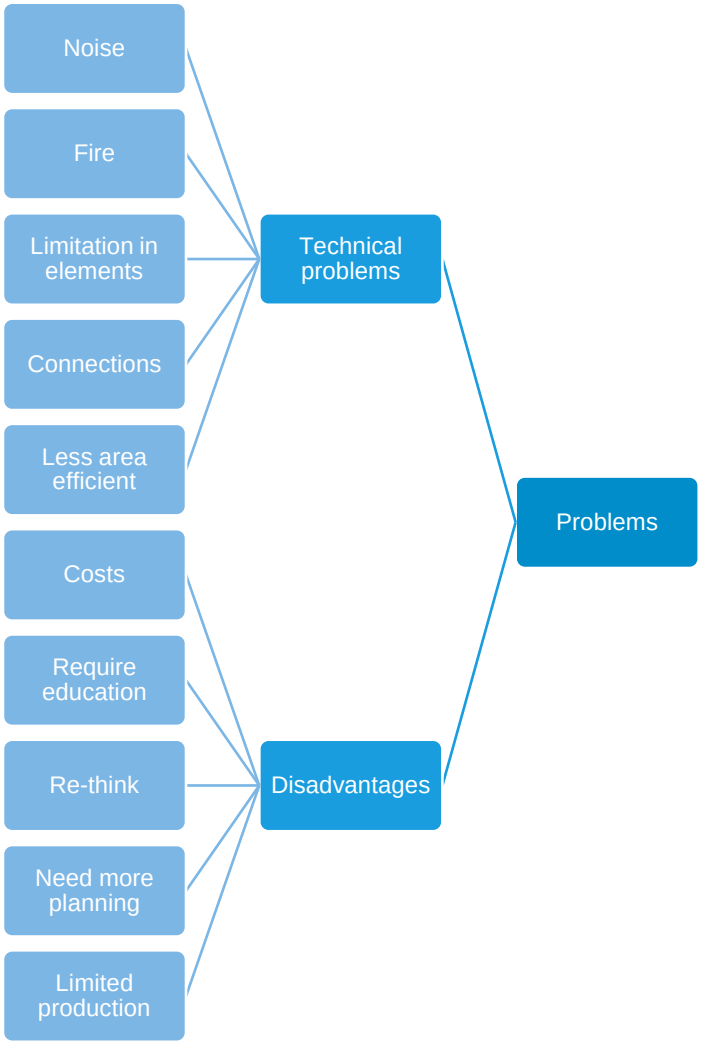
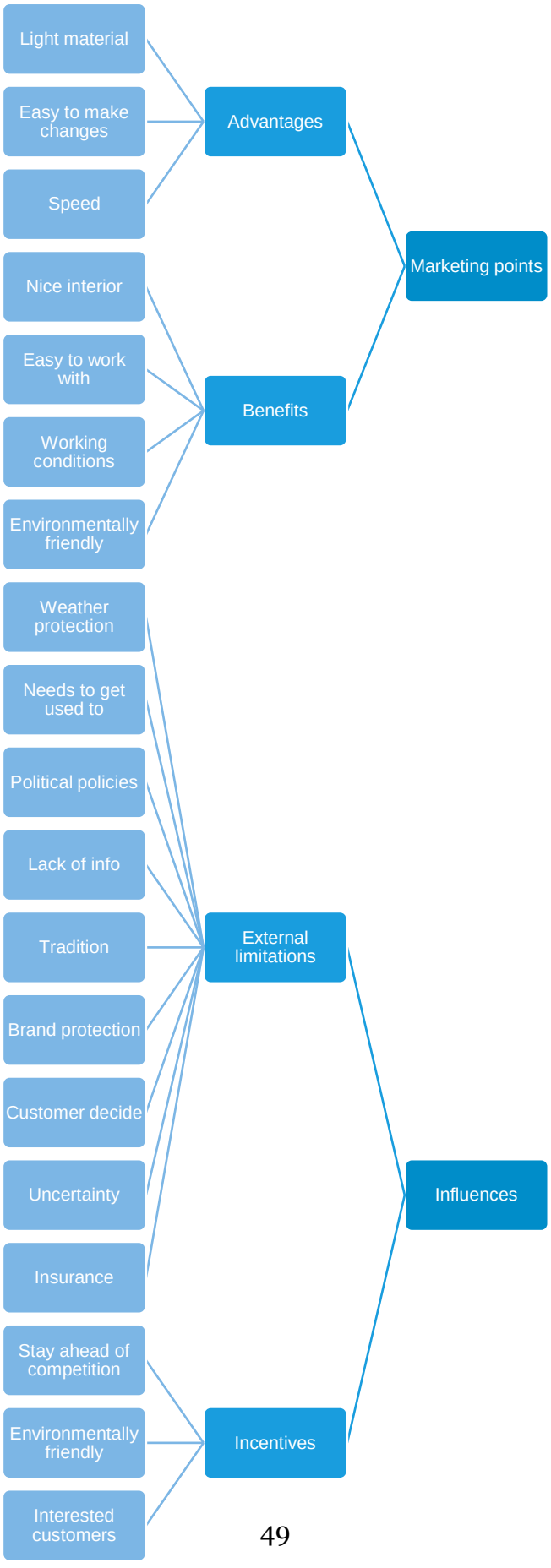
Appendix

Appendix 1 - Coding process




Light material
Easy to make changes
Speed
Advantages
Nice interior
Easy to work with
Working conditions
Environmentally friendly
Benefits
Marketing points
Weather protection
Needs to get used to
Political policies
Lack of info
Tradition
Brand protection
Customer decide
Uncertainty
Insurance
External limitations
Stay ahead of competition
Environmentally friendly
Interested customers
Incentives
Influences