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Co-operation for innovation: A descriptive foresight study for a regional industry cluster in the Järviseutu area

Järvi-Pohjanmaan Yrityspalvelu Oy

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Thesis Abstract

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Title of thesis: Co-operation for innovation: A descriptive foresight study for a regional industry cluster in the Järviseutu area

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The thesis represents a foresight process which recognizes future change drivers influencing businesses and future customer behavior in certain industries during the next ten years. These change drivers motivate actors to consolidate their business networks in order to maintain their competitive advantage. As a theoretical background, the study uses the combination of the Cluster Foresight Model (2012), introduced by Sorama, based on the use of cluster-specific foresight information for recognizing future knowledge needs, and the Continuous Strategy Process (2015), also represented by Sorama, which visualizes the opportunities of use of foresight information in the strategic work of businesses and organizations. The present study applies the aforementioned models for recognizing future customer needs and joint business opportunities for an industrial cluster.

The study was executed using a qualitative approach. The subject of the study was a regional cluster of manufacturing industries in the construction sector, chosen based on the preferences of the commissioner of the study. The Cluster Foresight Model was used in the recognition of future change drivers and their implications, and the methods used were desk study and semi-structured theme interviews. The selected change drivers were automation and robotics, service economy, cyber safety, sharing economy, emphasis on well-being, shift in power relations, circular economy, and the decrease of natural resources. The recommendations made through the implications were the importance of renewing the regional image by public and private service offerings and enhancing the resource efficiency of businesses through cooperative networks for maintaining their competitive advantage. As opportunities for joint business activities, the study suggests the creation of (joint) service offerings, joint marketing and demand creation, foresight knowledge-oriented R&D, flexible production, and the formation of a resource ecosystem.

Keywords: foresight, future, change drivers, cluster, housing, customer, digitalization, values, ecology

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Tämä opinnäytetyö kuvaa ennakointiprosessin, jossa tunnistettiin ne tulevaisuuden muutosajurit, jotka vaikuttavat tiettyjen teollisuusalojen liiketoimintaan ja asiakaskäyttäytymiseen kymmenen vuoden aikajänteellä, ja joiden vaikutuksesta toimijoiden on syytä tiivistää yhteistyöverkostojaan kilpailukykynsä säilyttämiseksi. Tutkimuksen teoreettisena viitekehyksenä käytetään Soraman kehittämää klusteriennakointimallia (2012), joka alun perin pohjautuu klusterikohtaisen ennakointitiedon käyttöön tulevaisuuden oppimistarpeiden tunnistamiseksi, sekä Soraman kuvausta jatkuvasta strategiaprosessista (2015), joka visualisoi ennakointitiedon hyödyntämismahdollisuudet yritysten ja organisaatioiden strategiatyössä. Tässä opinnäytteessä malleja sovelletaan teollisuusklusterin tulevaisuuden asiakastarpeiden tunnistamiseksi sekä yhteisten liiketoimintamahdollisuuksien löytämiseksi.

Tutkimus toteutettiin kvalitatiivisena tutkimuksena. Työn tilaajan intresseihin pohjautuen tutkimuksen kohteeksi valikoitui alueellinen rakentamiseen liittyvien teollisuudenalojen klusteri, ja muutosajureiden sekä niiden vaikutusten tunnistaminen toteutettiin klusteriennakointimallin mukaisesti sekä työpöytätutkimuksen menetetelmin että puolistrukturoitua teemahaastattelua käyttäen. Muutosajureiksi valittiin automatisaatio ja robotiikka, palvelutalous, kyberturvallisuus, jakamistalous, hyvinvoinnin korostuminen, valtasuhteiden siirtyminen, kiertotalous ja vähenevät luonnonvarat. Näiden muutosajureiden vaikutusten myötä todettiin, että alueen kilpailukyvyn säilyttämiseksi on tärkeää uudistaa alueen imagoa sekä julkisen että yksityisen palvelutarjonnan kautta ja parantaa yritysten resurssitehokkuutta yhteistyöverkostojen avulla. Yhteisinä liiketoimintamahdollisuuksina ehdotettiinkin (yhteisen) palvelutuotteen luomista, yhteisiä markkinointiaktiviteetteja sekä tarpeenluontia, ennakointitiedon hyödyntämistä tuotekehityksessä, tuotannon joustavuutta sekä resurssiekosysteemin muodostamista.

Avainsanat: Ennakointi, tulevaisuus, muutosajurit, klusteri, asuminen, asiakas, digitalisaatio, arvot, ekologisuus

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1 PREFACE

The idea of the thesis started with a discussion with Mrs. Kirsti Sorama (Dr. Econ. Sc. and a Principal lecturer in Seinäjoki Business School) in the spring of 2014. Sorama had recently published the Cluster Foresight Model tested in various industries with a practical outcome. The method appeared interesting, and the fact that the method had not been used in the manufacturing industries in the Järviseutu area ensured the conduction of the thesis by applying the Cluster Foresight Model to the region for its benefit. At the time, Järvi-Pohjanmaan Yrityspalvelu Oy, a local trades division, was implementing an Innovation pilot project for a search of innovative business opportunities for the companies in the area. After contacting the Project Manager Maarit Metsälä the thesis started to seek its form.

1.1 The Research Process

The Research plan got accepted by the thesis supervisor, Mrs. Sorama as well as the Dean at the end of spring 2014. The following figure (Figure 1.) demonstrates the research process step by step, in which the left side presents the project planning and subject exploring as the right side illustrates the proceeding of the empirical research. The interviews were executed in the fall 2015 and the final report was handed over in the spring 2016.

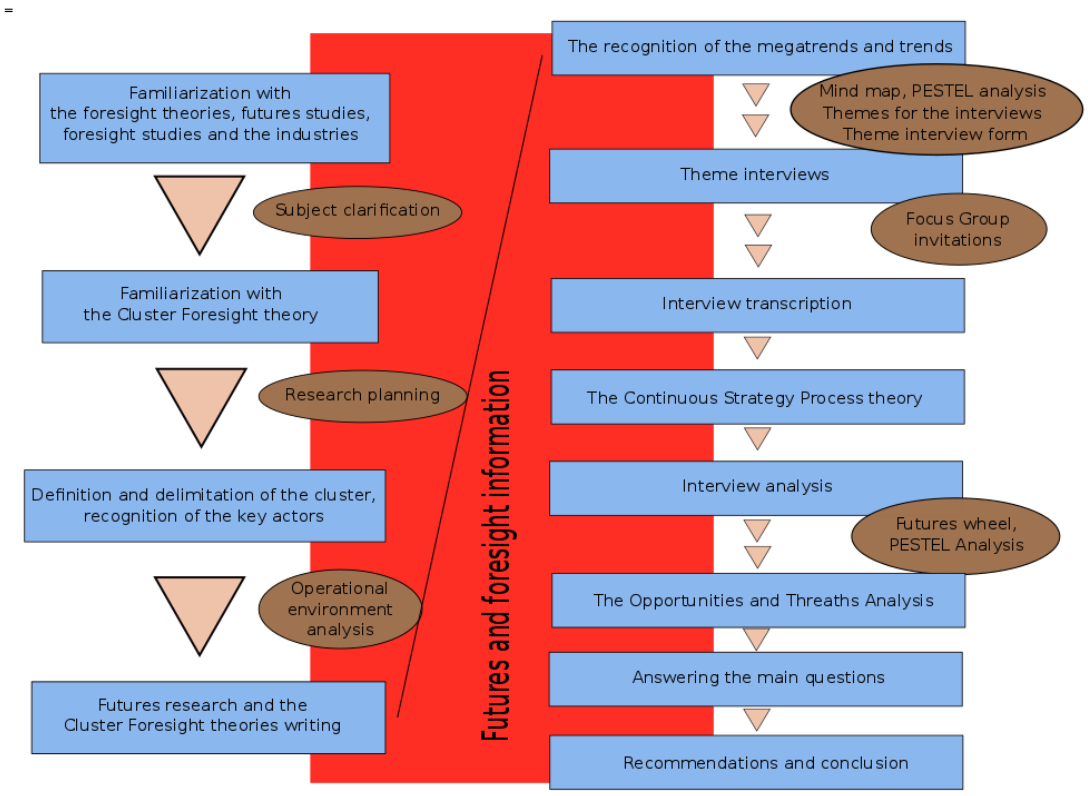

Figure 1. The Research process.

1.2 Backround

Järviseutu sub-regional unit, the cities of Alajärvi, Evijärvi, Lappajärvi, Soini and Vimpeli in South Ostrobothnia, has a strong geographical locus on building product industries, such as aluminum and steel, timber and processed wood, stone, rubber, plastic and decorative products, e.g. carpets. According to Palomäki (2012, 2-3), increase of the processing degree is important for the development of the businesses and will be reached by the addition of the innovation and research and development competence within the companies through innovative co-operation and networks. The study will focus on recognizing the future change drivers which will affect to the building product customer needs and new business opportunities and thus enable the growth of the cluster, its actors and the area.

The construction industry is in turbulence since the economic downturn and the high prices of the raw materials, as well as the business climate in general as a result of the globalization, the ecological changes and the technological revolution.

Industries need to re-evaluate the ways of doing business, the products and the processes, to satisfy the environmental demands suggested by Palomäki (2012, 4), which are the efficiency of the use of materials and energy in addition to material recycling and reuse. The region requires the increase of the business competitiveness which is reachable via cross-industrial co-operation. The thesis will provide information on future changes in the industries and the customer demands in order to enable the recognition of new business opportunities meeting the needs and thus giving a basis for further research and development of co-operation. As said by Palomäki (2012, 2), the companies share the intention and are committed to welcome new ideas for business development through networks. The sponsor of the thesis is the local cities' and business association Järvi-Pohjanmaan Yrityspalvelu Oy, consisting of the Alajärvi, Vimpeli and Soini cities, 22 local companies and a bank. (Järvi-Pohjanmaan Yrityspalvelu Oy, 2014).

1.3 Aims of the Study

The target of the thesis is to produce a descriptive study of a regional cluster for Järvi-Pohjanmaan Yrityspalvelu Oy, aiming to discover the future change drivers in customer demands that could be fulfilled by the formation of a cluster and lead to further research of innovative businesses in construction and the building product industries and hence increase the competitiveness of the local companies at issue.

The idea of the thesis is to examine and foresee the future changes in ten years from the perspective of construction, the building product industries and their business environment, for the recognition of changes in customer demands which could create new innovative opportunities and thus be fulfilled by having potential for further research and development.

1.4 Main Questions

What is the ten-year future outlook for the building product industries in the area? How are the future customer and housing like in 2025? What is / are the change

driver(s) that force the formation of a cluster for innovative practices meeting the future customer demands?

1.5 Study Delimitations

The study focuses on the examination of the future trends and the recognition of the future customer needs by the perspective of a regional cluster in the Järviseutu area and by the use of foresight methods, the Cluster Foresight Model (Sorama 2012) and the stages of the Continuous Strategy Process (Sorama 2015). The study will not suggest product innovations.

1.6 Research Methodology

The research is executed with anticipatory methods, Sorama's Cluster Foresight Model (2012), the Continuous Strategy Process representation (2015) and a use of qualitative research methods including theme interviews and group work. The Cluster Foresight Model comprises the definition and the delimitation of the cluster, the identification of the future change drivers in the industries and the general future view via utilization of the existing information. As the key actors of the cluster are identified, interviewed and the outcome examined through a focus group work, the results analyzed using the stages of the Continuous Strategy Process representation clarify the visions of the cluster's future with the regional perspective, enabling further research depending on the results.

1.7 Structure of the Thesis

The thesis is structured from a theoretical framework in Chapter 2, presenting future and foresight studies and methodology, and the Cluster Foresight Model (Sorama 2012) including Michael J. Porter's Five Forces Model (1998), and the Continuous Strategy Process (Sorama 2015), both used in the execution of the empirical research part of the study in Chapter 3. The empirical research proceeds following the Cluster Foresight Model introducing the area, its industries and the

cluster, the foresight information and the identified and defined future change drivers, the interview, the interview analyses and the recognized future for the cluster. Chapter 4 consists of the recommendations for the cluster based on the research findings. Chapter 5 draws the conclusions of the research by reflecting the models' applicability in the region and the research questions, the process itself and the study learnings. The theme interview form is represented in the Appendices part.

2 FORESIGHT, THE CLUSTER FORESIGHT MODEL AND THE CONTINUOUS STRATEGY PROCESS

2.1 Future, Change and Stability

Rubin, in Topi Tulevaisuudentutkimuksen oppimateriaali, describes the future to be a complex mix and a consequence of an extensive variety of occurrences which we know nothing definite of, excluding the nature laws. It is said to consist of five components and their interrelations: incidents, trends, emerging phenomena, future outlooks and action. Mannermaa proposes the future to be seen, not as a singular “Future”, but as a group of possible futures. (Mannermaa 1999, 17, 19, Topi Tulevaisuudentutkimuksen oppimateriaali.)

Change is said to be the only thing that is permanent, and yet, stability seems to be as permanent as change. According to Hiltunen, change takes place since the atypical behavior of numerous people, and through the technological development with increasing speed. Basic human needs remain the same, though and maintain stability. Challenge of the futures research is to recognize the change, evaluate the speed or the shift of the direction of the change, and to identify the stabilities. (Hiltunen 2012, 22, 43, 76-77.)

2.2 Foresight

Foresight (a part of futures research) is multi-scientific anticipation of the future, including, as Heinonen states, the possible, the probable and the desired future outlooks. Mannermaa clarifies the object of the futures research being “*the human and his systems; technology, economy and society”*, in “*interactive complex*”. Therefore the anticipation is considered challenging; the high-quality research requires a massive set of information in both, different time- and different area dimensions, writes Sorama. (Heinonen 2006, 9, Mannermaa 1999, 23, Sorama 2012, 8.)

Heinonen & Daldoss separate the concepts of the foresight and the forecast as follows: seeing an occurrence before it realizes differs it from the forecast, which draws future conclusions from the present. They suggest the main question of foresight to be "*How to think about the problem?*". Sorama adds the foresight not to be a prediction of the future since the uncertainty of the upcoming, but being an anticipation of the future occurrences and phenomena. (Heinonen 2006, 25, Sorama 2012, 7.)

Hiltunen recognizes three essential tasks of futures thinking to be the foresight, the innovation and the communication. Whereas foresight guides the observation and action towards the future changes, innovation urges activity in creating the desirable future and communication attracts interest, creates new and encourages interaction. (Hiltunen 2012, 18-19)

2.2.1 Foresight Motivation

The development of the societies can be observed as different cycles or phases. A systematic futures research enables the identification and the value recognition of the social and economic impacts of occurrences as well as the chain of events. Heinonen argues the foresight to give an opportunity to influence the future, which is seen as the main motivation, as well as a possibility to sketch and attempt to achieve the desired future. Mannermaa turns the idea to sketching the undesirable future development as well, to avoid its realization. (Heinonen 2006, 9, Mannermaa 1999, 20, 23.)

In the context of corporate strategic planning, the decisions traditionally base on probabilities whereas foresight, in comparison, additionally encourages to alternative thinking, states Vuorinen. The combination of futures thinking and understanding the changing operational environment enables the innovativeness and thus a competitive advantage, Heinonen adds. Based on an EU research in 2002 conducted by Patrick Becker, Hiltunen lists various motives for continuous corporate foresight: long-term world and customer views, proactive innovativeness, surprises elimination, open communication and future changes

evaluation for strategy processes. (Heinonen 2006, 26, Hiltunen 2012, 243-244, Vuorinen 2013, 120.)

2.2.2 Foresight Methods

Foresight research can be executed either with quantitative or qualitative research methods. With quantitative methods, the required data is more numeric and the quantities enable the research validity, opposite to qualitative methods that are used when the simple indicators do not serve the purpose of, e.g. important trends or development flows, and when the data does not yet exist. (Sorama 2012, 10-11) The following paragraphs introduce the foresight methods briefly.

Anticipative mindset. Sorama et al. (2013, 11) define an anticipative mindset to be, rather than a method, a conscious way to respond to and evaluate changes in the operational environment and their background influence, and thus able to be actively improved. It focuses on challenging the routines and encourages questioning the known as well as bringing up new ideas and behavior.

Operational environment analyses. "Environmental scanning", or "futures scanning", as it is called as well, is a crucial part of a futures research process, apart from being a method itself. The Finnish National Board of Education defines environmental scanning as "observation and understanding of different phenomena and their changes, from the future consequence perspective of events, decisions and choices". The changes in the operational environment are identified and analyzed via the basic foresight concepts: *megatrends, trends, weak signals, wild cards* and their *driving forces*. For operational environment analyses Sorama et al. suggest statistics, interviews, magazines, publications and the Delphi Method, for example, being suitable sources. (The FNBE, 22, Sorama et al. 2013, 11, Topi Tulevaisuustutkimuksen oppimateriaali.)

Hiltunen explains the idea as follows: the broad changes comprised of various trends are megatrends. Trends, for one, are mixtures of rising phenomena, which are observed via weak signals. Wild cards, black swans (Taleb) and X-events (Wilenius & Kurki) share the idea of sudden changes with wide-ranging

implications. Stabilities (*invariants*), however, barely change. (Hiltunen 2012, 76, 157-158, Wilenius & Kurki 2012, 33.) The relations between megatrends, trends and weak signals are visualized in the following figure by Hiltunen (Figure 2.).

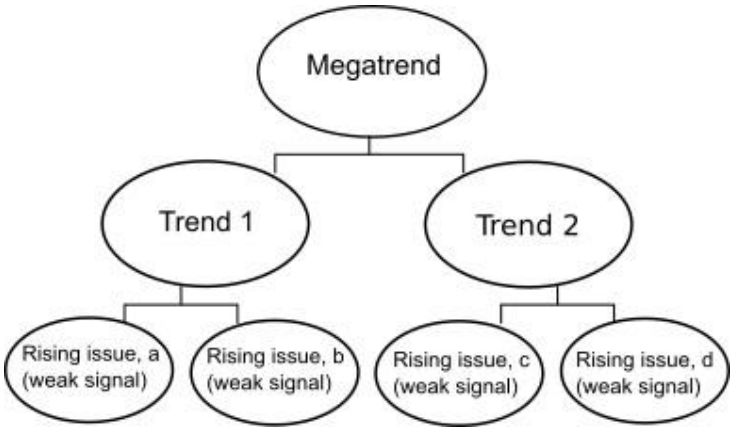

Figure 2. The relations between megatrends, trends and rising issues (weak signals). (Hiltunen 2012.)

The concept of megatrends was first introduced by the Futurist John Naisbitt in the 1980's and is presently one of the essential concepts in foresight. A megatrend is a slowly developing phenomenon representational to present, having a broad influence on matters for certain time, "seven to ten years or so" (Naisbitt), and is widely recognizable. Therefore, a megatrend has by historical means an assumption for customary continuum. An example of a megatrend would be the climate change. Conversely to a megatrend, the comparable future continuum of a trend is uncertain. Yet it sets the direction for a possible significant change. In foresight, one of the basic trend categorizations is STEEP Analysis (or PESTE/PESTEL), where S = Social, T = Technological, E = Economic, E = Environmental, P = Political, L = Legal, helping the observation of the changes in the operational environment. An example of a trend, writes Hiltunen, would be the rewarded recyclability of consumer goods. (Hiltunen 2012, 78-80, 94-97. Opetushallitus, 22, Sorama 2012, 100.)

The identification of the rising issues, weak signals, is one of the most troublesome and hence one of the most powerful parts of the futures research, as the belief of gaining an edge towards rising events by an early reaction, states

Mannermaa. In comparison to trends, weak signals lack history to reflect on. Sorama adds them to seem faint, surprising and strange, yet having the possibility to become the “Next Big Thing”. (Mannermaa 1999, 87, Sorama 2012, 12.)

The driving forces, “drivers” describe the beliefs, issues and common suppositions of the time, and are therefore tightly connected to values, attitudes and appreciations. They guide decision making at conscious and subconscious levels without having a clear direction on their own. (Topi Tulevaisuudentutkimuksen oppimateriaali.)

Delphi method. The Delphi method is one of a few methods particularly developed for futures research. It is a survey, where the information is gathered anonymously using a structured or a semi-structured questionnaire. The idea of the method is to demonstrate an outcome representing the time’s experts’ future images rather than the actual accuracy of the results or a statistical representativeness. (Mannermaa 1999, 146, 148, Sorama et al. 2013, 12.)

Scenarios. Scenarios are visions of alternative futures at the end of logical chains of events, and are drawn as a result of futures research. The idea, in addition to the visualization of possible desired, undesired, likely or unlikely outcomes, is to envision the path between present and the future. (Mannermaa 1999, 57.)

The Future Workshop method and other team work methods. Sorama et al. describe the Future Workshop method as well as other comparable methods, to base on gathering key actors of the subject area to structured discussion, for a composition of an overall picture. Additionally, the workshops enable e.g. innovation, problem solving and spread of knowledge. (2013, 12.)

Time series and mathematical methods. According to Sorama et al., there are multiple numeric methods in use offering accurate quantitative data of the history. However, the qualitative information affecting the possible changes is excluded in the statistics. With the acknowledgement, they provide usable bases on foresight. (2013, 12.)

2.3 The Cluster Foresight Model

The cluster foresight model is introduced by Sorama in the research for anticipating the future knowledge needs by cluster foresight. The challenges of the Finnish competitiveness from the aspect of the work life and the operational environment, such as globalization, the economic structure changes and ageing, force the universities and businesses to act together for the identification of the knowledge and skill needs in the future work life. The model is developed for continuous use primarily in the universities of applied sciences for anticipating the future knowledge needs in a specific cluster for the following five to ten years. (Sorama 2012, 7.)

Sorama (2012, 15) proposes the model of cluster foresight which incorporates four stages: the definition and delimitation of the cluster, the identification and utilization of the existing knowledge of the future change drivers, the recognition and definition of the future and the recognition and analysis of the cluster future needs. The following figure demonstrates the process (Figure 3.).

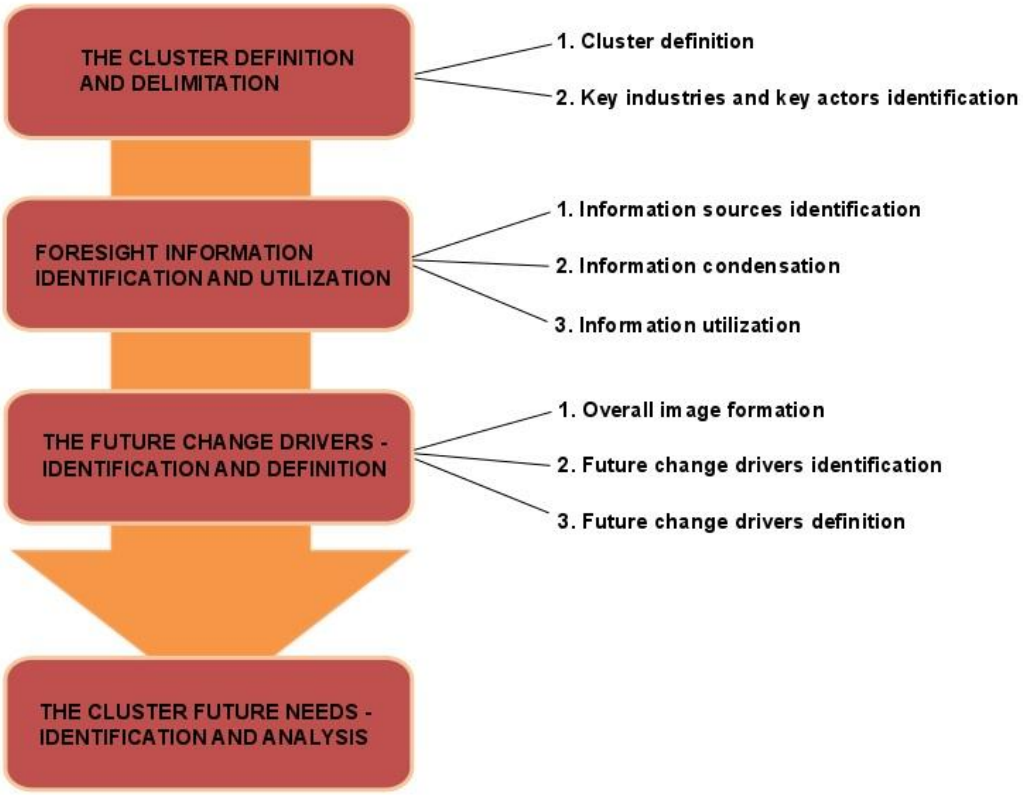

Figure 3. The Cluster foresight process according to Sorama (2012.) Edited.

2.3.1 Definition and Delimitation of the Cluster

Sorama (2012, 19) presents the cluster definition and delimitation model by Lasse Ala-Kojola. The term “cluster” was first introduced by Michael E. Porter in 1990 and now has several clarifications throughout the literature. Porter defines a cluster (2003, 562) being ”*a geographically proximate group of interrelated companies, suppliers, service providers and associated institutions in a particular field, linked by externalities of various types*.” Hence, a cluster is a locus of skills and knowledge between its actors crossing the traditional lines of industries for mutual benefit and synergy. Porter adds the “knowledge spillovers” inside the cluster affecting innovation and heightening performance.

According to Sorama, the cluster structure bases on the approach of the product value network which consolidates the suppliers and the organizations producing goods or services to the customer. The aspect culminates in the key product;

defining the key products leads to the identification of the main customer businesses that create the demand conditions for the cluster. Therefore, when defining a cluster, Sorama recommends of using Porter's "Diamond" model and focusing on the product. (2012, 21.)

Porter's Five Forces. Based on his studies of different nations and their competitive advantage, Porter presents the noted Five Forces, or the "Diamond" Model setting the grounds for a cluster examination. The "Diamond" gathers four elements which individually and in interaction influence a competitive environment and advantage of a business: factor conditions, demand conditions, related and supporting industries and firm strategy, structure and rivalry. (Porter 1998, 71.)

The factor conditions are the competition inputs: labor, infrastructure, capital, arable land and natural resources. The demand conditions compose of the domestic demand by the abilities of a business to perceive, interpret and react to the home customer needs. The related and supporting industries' national presence and international competitiveness improve the competitive advantage. The firm strategy, structure and rivalry comprise the formation, organization and management of a business together with the nature of home market competition. (Porter 1998, 73-74, 86, 100, 107.)

Porter acknowledges two additional determinants to affect the national competitive advantage; the chance and the government. Chance events, such as inventions, world financial state occurrences or wars, may change the competitive positioning of the business by disruptions. The government's politics, in addition, affects the business's status in the international competition by all four elements via laws and regulations. The Porter's Diamond is presented in the following figure (Figure 4.). (Porter 1998, 124, 126-128.)

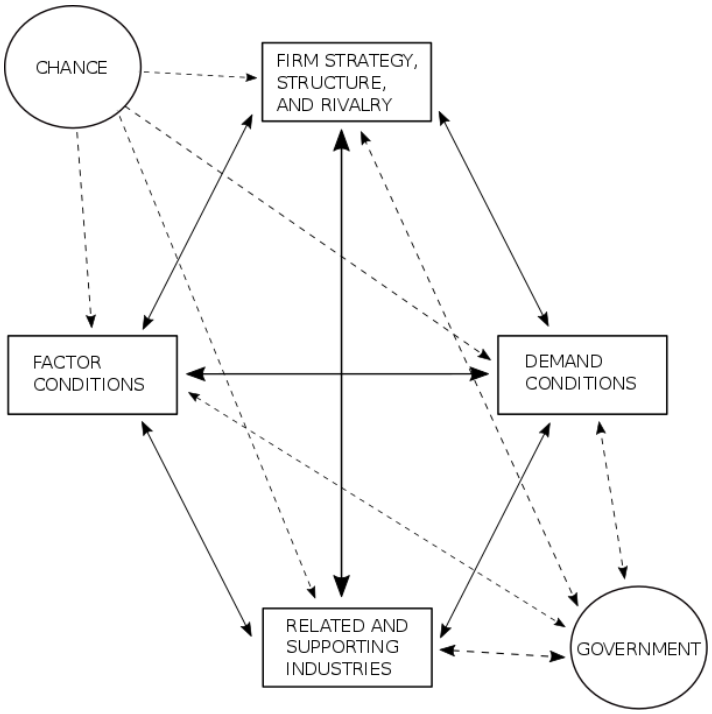

Figure 4. The Porter's "Diamond". (Porter 1998.)

Cluster delimitation. Sorama states, according to Jacobs & De Man (1996), that there are six perspectives to define clusters: geographical, horizontal, vertical, lateral, technological and focal. Ala-Kojola (2009) presents the aspects in the following figure (Figure 5.).

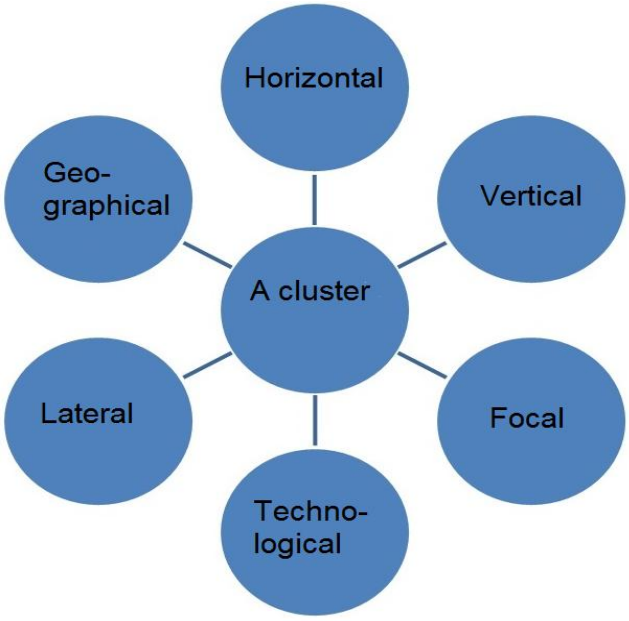

Figure 5. Aspects to a cluster examination according to Ala-Kojola. (Sorama 2012.)

A geographical cluster is a network of companies that are situated geographically close to each other and share the information and the work efficiently by specialization. *A horizontal cluster* considers the traditional thinking of sectors; every actor of the value chain, regardless of the field of operation, is a part of an ensemble serving a certain industry or business, whereas *a vertical cluster* combines the parts of the consecutive production process phases to an entity, aiming to e.g. add value to the customer by refining the raw material. *A lateral cluster* shares the resources and the capacity between the branches for gaining the most economically optimized outcome, and *a technological cluster* employs the technology, such as the information technology, between industries. *A focal cluster* acts around a specific operator, e.g. a business, a university, a research center or a family. (Sorama 2012, 20-21.)

The cluster definitions may often be unified, which is somewhat aspired. According to Ala-Kojola (2009), the delimitation of a cluster, however, bases on a subjective perception and depends on the objectives to be reached by the delimitation. A cluster may overlap other clusters (e.g. the construction cluster and the forest

cluster) thus creating an exceptionally complex entity, which Sorama suggests to be examined from the perspectives independently. Hence, the definition and the delimitation of the cluster are reasonable yet the explicit logic is required. For the recognition of the key industries and actors, Virtanen and Hernesniemi advice to take notice of the turnover and volumes between the cluster's actors in the delimitation process via input – output analysis, for example. Sorama adds network charts to be helpful. (Sorama 2012, 20, 22, 92.)

2.3.2 Foresight Information Identification and Utilization

As Sorama suggests, the recognition and the utilization of existing foresight information sources takes place during the whole foresight process as the information constantly renews. Additionally, the information gathered in the beginning usually needs specification. Sorama emphasizes the importance of scanning the change factors in the operational environment and as a suggestion of approach the trends, megatrends and weak signals identification is applicable (2012, 32, 96.).

There are dozens of sources producing foresight information, megatrends and trends lists. The identification of the essential sources is challenging, yet the perspective of the cluster, its industries and key actors guides to the desired direction. For the relevant and satisfactory foresight source material Sorama recommends exploring diverse, both national and international foresight-oriented organizations, governmental departments, academies, scholars, communities etc. also in both, universal and cluster level. Furthermore, the information produced by different associations, businesses and hubs may indicate weak signals of a sort and therefore advice in interpreting the information or discovering new perspectives for the cluster's future environment. What is there to notice, the focus of the geographical cluster level information needs to be on the key actors' customers' operational environment. (Sorama 2012, 28, 95-96.)

As applicable sources, Sorama lists for example EU Technology Platforms which connects business and research and publishes accurate strategy- and foresight information in the most important industries in the EU, The Federation of Finnish

Technology Industries, The Confederation of Finnish Industries (EK) and Strategic Centres for Science, Technology and Innovation (SHOK). Focusing on five to ten key information sources is advisable. As the information starts to condense by not applying anything new, the search for sources is complete. (Sorama 2012, 95-96.)

The observation of the future changes requires not only the recognition of events and innovations but the understanding the social changes, their causes and affects as well, states Wilenius & Kurki. However Sitra reminds that the objective exploration of the social changes is nearly impossible, since the complexity and the dynamics of the world, and as the phenomena are mixtures of trends and events. Wilenius & Kurki therefore speak for abandoning the mental limitations of current ways to produce and consume as well as understanding the full potential of new technologies. (Sitra 2015, Wilenius & Kurki 2012, 13, 15.)

As the general view of the cluster and the future challenges in its environment develops via the adopted information, the result is presented to the key actors in a form of a theme interview for them to evaluate and comment on the future change drivers in their organizational perspective. The theme interview outcome is analyzed and the main change forces identified and yet represented as the conversation themes in the next phase, a Focus Group workshop. The group work takes the discussion to the actual cluster level for the purpose of the cluster future key change drivers recognition, which sets guidelines for the desired actions for the cluster and its organizations. (Sorama 2012, 95-96.)

2.3.3 Future Change Drivers Recognition and Definition

The future change drivers are the anticipated phenomena which are identified via foresight information examination and are expected to have an impact on the future's formation. For the creation of an overall image of the cluster's future Sorama recommends using applicable sources, such as the key actors of the cluster. After the identification of 6 - 10 cluster's key change drivers, the findings are analyzed separately using e.g. the PESTEL analysis to understand the impacts of every driver. The ideas are presented to the key actors in the theme interviews, which set the guidelines for the following Focus Group work. The aim

of the team work is to create the future views of the cluster; the mission, the actors and their roles, as well as to evaluate the cluster's future needs. The formed views of the future are both written down and visualized using e.g. the Futures wheel as a visualization tool presented in the following figure (Figure 6.), where the theme is positioned at the center, the cluster's mission to the inner circle, the actors to the second circle, the roles to the third circle and the future needs evaluation to the outermost circle. (Sorama 2012, 97, 99 - 100.)

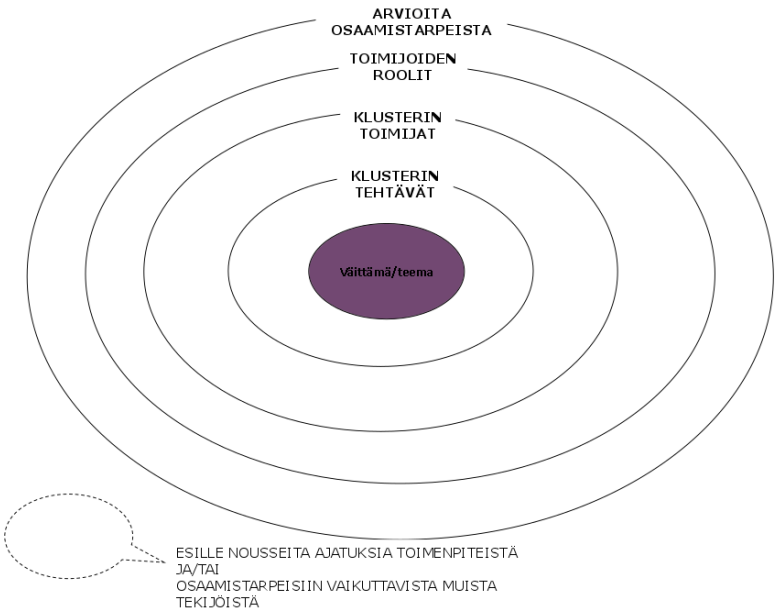

Figure 6. The Futures wheel. (Sorama 2012.)

2.3.4 Cluster Future Needs Recognition and Analysis

Sorama suggests the cluster future needs recognition and analysis to begin with a discussion of the future views created in the earlier stage of the cluster foresight process. The future needs are observed intensively, prioritized and categorized e.g. by answering the following questions:

- *What* does the particular need denote to the cluster?
- *Does it connect* with other recognized needs and the ongoing operations in the cluster?
- *Which* needs are taken action?

– *How* the needs are fulfilled / should be fulfilled; does it concern operations, people or something else?

Again, the results are analyzed using for example PESTEL and SWOT (Strenghts, Weaknesses, Opportunities and Threats) analyses, mind-mapping or a futures wheel to build future scenarios for the cluster and its needs, in order to create a strategy and the implementation plan. (Sorama 2012, 100-101.)

2.3.5 The Continuous Strategy Process

For organizations' strategic update tool Sorama (2015) represents the continuous strategy process, which links the future change drivers defined in the cluster foresight process to the actual strategy process. The continuous strategy process is introduced roughly in the following figure (Figure 7.) and in the following paragraph.

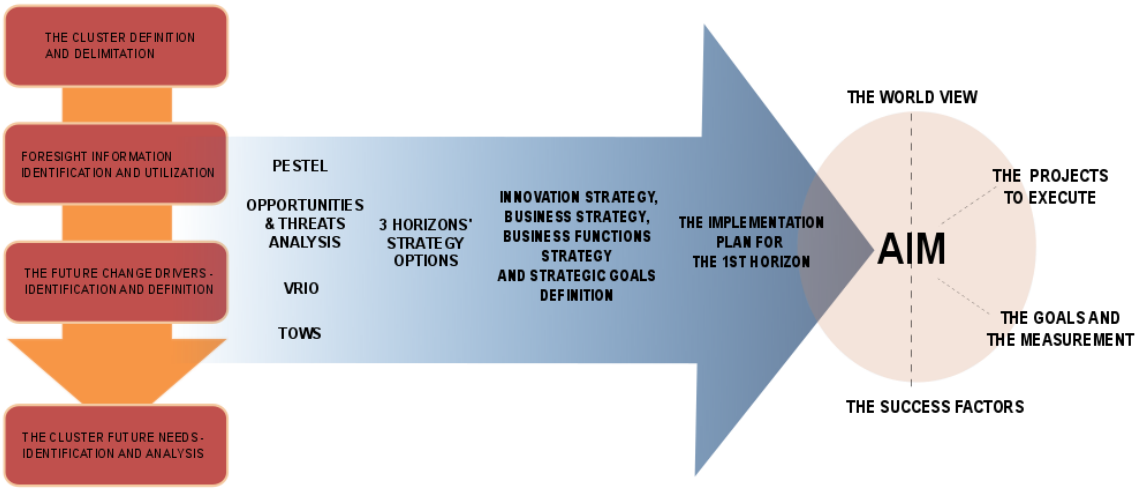

Figure 7. The continuous strategy process according to Sorama (2015. Unpublished). Edited.

As the cluster foresight model is designed primarily for educational development purposes, the continuous strategy process representation clarifies the foresight model's usability in any organization in order to recognize additional business

possibilities through the future customer and future demand identification. Thus, Sorama (2015, Metsälä 2014, 22) suggests the phase of the future change drivers identification and utilization to conduct to strategy options planning from three horizons: the business today, additions or substitutes for the business today and options for the business in the future. Each of the horizons is examined in the time range depending on the industry and the change velocity of the business environment. In addition to PESTEL and SWOT analyses the model offers VRIO (Valuable, Rare, Imitability and Organization, for the recognition of the physical, economic, organizational and human resources adding competitive advantage) and TOWS (advanced SWOT for strategic planning) matrixes introduced by Vuorinen (2013, 90, 150-153) as useful tools for following the path to the strategy options planning. The final phases of the model are the definition of the innovation strategy, business and business functions strategy and the strategic goals of each as well as the implementation plan for the first horizon. The outcome of the process is the aim of the business, answering the questions “What do we want to be?” and “Where are we going?” through the perspectives of the perceived world view and the success factors of the business in the perceived world. The aim guides the operations through the identification of the strategic goals, the goal-reaching measurement and the executed projects.

3 CLUSTER FORESIGHT FOR THE JÄRVISEUTU REGION INDUSTRY CLUSTER

3.1 Definition and Delimitation of the Cluster

The definition and the delimitation of the cluster were somewhat simple through the co-operation with the local development organization Järvi-Pohjanmaan Yrityspalvelu Oy JPYP, which set the regional interest guidelines in its operational area, the cities of Alajärvi, Soini and Vimpeli. However, from the national perspective, the region is recognized as the sub-regional unit Järviseutu additionally including the cities of Evijärvi and Lappajärvi, which facilitates the information relevance and was therefore chosen for the observation in the research. Consequently, the cluster examination of the research concerned the area as a regional cluster. The nature of the industries in the region set the focus on the building product industry from its different sections. The key actors were selected by the recognition of the key product, by the suggestion of the ELY centre and the advice of JPYP's and the South Ostrobothnia Regional University experts.

The following paragraphs introduce the region and its main industries and key actors, the building product industries and construction in general, their present states and future outlooks both nationally and internationally.

3.1.1 The Järviseutu Region

Järviseutu is located in the lakes area, East side of the South Ostrobothnia region in western Finland and comprises the cities of Alajärvi, Evijärvi, Lappajärvi, Soini and Vimpeli, having total of 21 572 inhabitants, according to Statistics Finland (2015.). Figure 8. shows Järviseutu on the map.

Figure 8. Järviseutu sub-regional unit. (Enterprise Finland.)

South Ostrobothnia Centre for Economic Development, Transport and the Environment ELY reports Järviseutu area having 2113 businesses employing 4662 people (year 2012). The main industries are upgraded aluminum production, steel and building component industries, log house and timber industries as well as extractive industries, such as fur production. Thus, the companies compose a strong local building product network and overlap other clusters, such as the forest and the chemistry cluster. Aisapari ry recognizes the strengths and the strategic focuses of the area lying in housing, metal industry, bio-energy, tourism and experience industry. (Aisapari ry 2009, 11-13, ELY centre 2014.)

Table 1 by Statistics Finland (2015) illustrates the main industries in South Ostrobothnia in the year 2013 by turnover, presenting the relations between the building product industries similar to Järviseutu region, where the metal product industry being the largest, the machinery product industry being second, the wood and wood product industry being third, the rubber and plastic industry being fourth and the textiles industry being fifth. The main industries' relations to services in the area are shown in Figure 9.

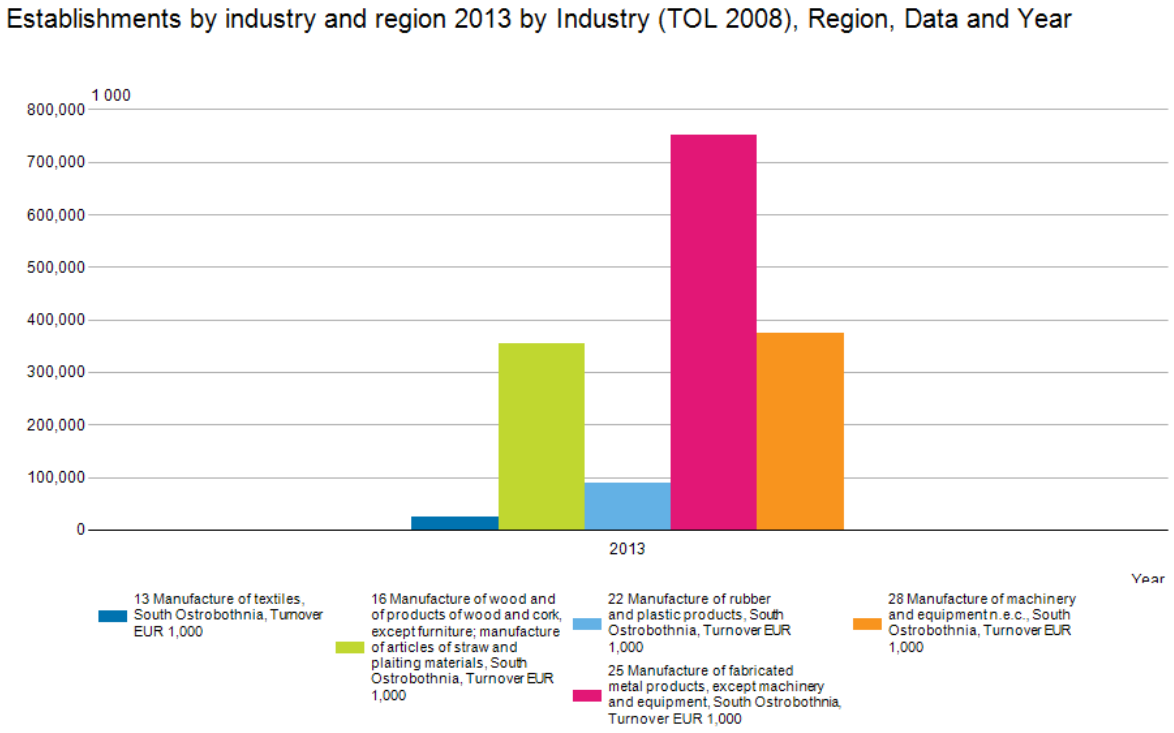

Table 1. Fields of operation in industry by turnover EUR 1,000 in South Ostrobothnia 2013. (Statistics Finland, 2015.)

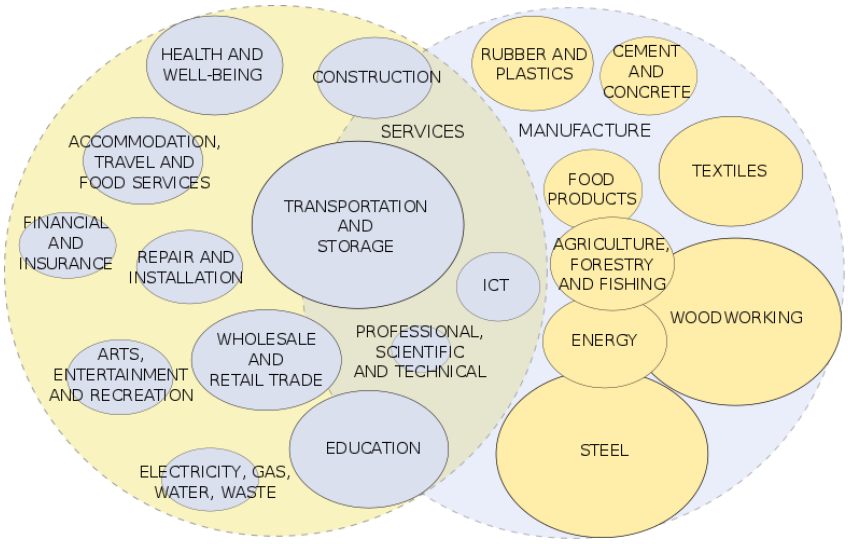

Figure 9. The main manufacturing industries and services in the Järviseutu area.

The main actors in the industries, listed by the ELY centre (2014), are Finnlamelli Oy (log houses), Keitele Timber Oy (sawmill) and Ruukki Construction Oy (steel). Other remarkable innovative and / or export-stressed SME's are e.g. Mäkelä Alu

Oy (aluminum profiles), Tikli Group Oy (spirit levels and aluminium products), Saltex Group Oy (indoor and outdoor carpets and surfaces), Artopine Ltd (windows and doors) and Oy Kohiwood Ltd (wood components). However, the business stock of the area comprises mainly of small and medium-sized sub-contracting companies for the main industries.

The Regional Council of South Ostrobothnia sees the megatrends of globalization, the global distribution of work, digitalization, the changes of population, ecological issues and the consumer-oriented production as being crucial for the competitiveness of the area. South Ostrobothnia ELY centre states to be confident in the development of the log house and sawmill industries in the Järviseutu region through Finnlamelli's growth and the recent opening of the Keitele Timber sawmill in Alajärvi, inspite of the closure of the Honkarakenne log mill. However, the unfavorable age structure and the negative migration threat the future regional development. Siltanen adds the challenges in South Ostrobothnia being the lack of an academic university, slight research activities and a low level of education. Nonetheless, the challenges have been recognized and actively developed. (ELY centre 2014, The Regional Council of Ostrobothnia 2014, Siltanen 2010, 21.) The opening of a cross- laminated timber (CLT) house element factory in Alajärvi in 2016 will rejuvenate the house building business and the employment in the area.

3.1.2 The Key Industries and the Key Actors

The key industries are different building product industries and their sub-contracting businesses. The gathered information and the recommendations of the local experts assisted on the recognition of the key actors and the selection of the interviewees. The key actors are mainly export-stressed and cover different building product industries in the region: log houses and CLT elements and components, aluminum and steel products, molded plastic and carpets and outdoor surfaces. Most of the actors have their own products as well as subcontracting practices; therefore the customers are mainly businesses in Finland and Scandinavia, Baltics, Russia, Europe, North Africa and East Asia.

3.1.3 The Key Industries Overview

Construction. The construction cluster comprises the wood products, the metal structures and the carpentry industries, represents Siltanen, and plays a major role in the forest cluster. The Confederation of Finnish Construction Industries CFCI clarifies the sector to include also infrastructure, HPAC and surface businesses. Thus, the construction industries overlap other networks and clusters, such as metal, energy and chemistry. (CFCI 2015, Siltanen 2010, 23.) The study does not focus on the construction industry itself but is observed since the tight relation to the key industries. Figure 10. illustrates the construction cluster's relations to other industrial clusters.

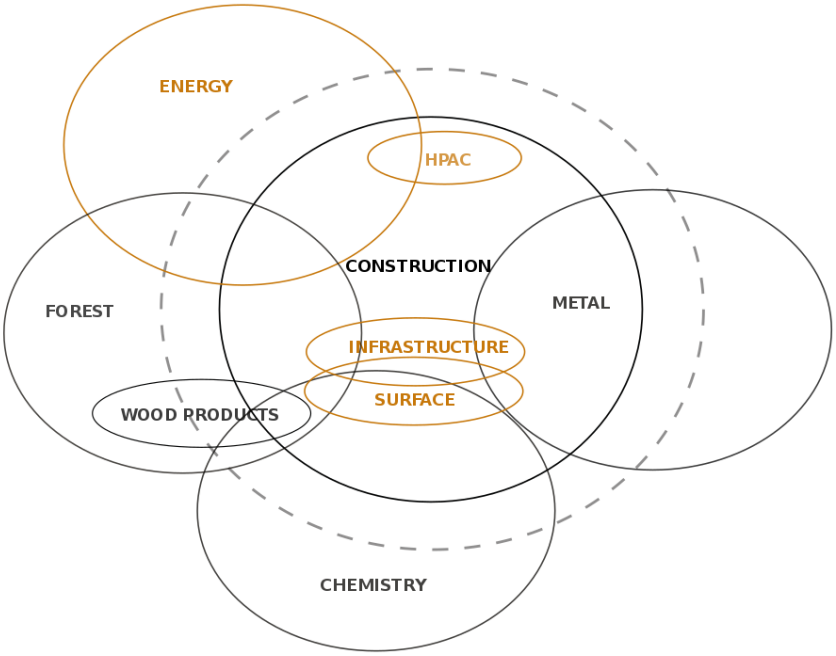

Figure 10. The construction cluster and overlapping industrial clusters.

The construction industry has plunged for several years and has very modest expectations for the near future both in Finland and globally, informs The Confederation of Finnish Industries EK. However, The CFCI reports the urbanization in Finland having started and accelerating which challenges the housing production and the infrastructure since the supply being presently

inadequate. Additionally, the increase of the immigration raises the pressures for urban housing. IHS forecasts the spending in construction in total to focus mainly on developing regions as the Asia-Pacific area, Middle East and Africa, Eastern Europe and South America until 2027, as Asia-Pacific will account for half of the world's residential building spending as well as the major growth expectations for spending in non-residential building led by China and India. (CFCI 2015, EK 2015b, 2, IHS 2013, 7-9.)

Steel and aluminum industries. The steel industry has been in low in profitability since the downturn in 2008. Yet, the confidence in the future is there; while the new technologies are emerging, the dependency to steel is present, and thus will not be threatened in the near future but enabling the new technologies arise, states Birat. The main challenges regarding the industry are sustainability and ecological issues. Yet, the urbanization is anticipated to continue acceleration, which sets enormous possibilities for steel. As a steel producer, Europe is the second largest in the world as the first being China and as a consumer, the European Union region is the largest although Asia being shortly passing. (Birat 2015, 2, 6-7.)

Woodworking. The woodworking industry consists of sawmilling, wood construction products and furniture and plays the most significant part of the forest-based industries at the European level, informs the European Forest-based Sector Technology Platform FTP. Presently, Sjolie et al. state the forest industry being challenged by the attitudes towards the ecology and the varying material prices of the production. Furthermore, the FTP recognizes the future challenges of ecology, changing customer demands and the complex technologies affecting the sector. Simultaneously, it trusts in the possibility of the sector being the key enabler for overcoming the issues in question by the natural and renewal character of the raw material accompanied by sustainable production solutions. Sjolie et al. add the interest in bio-based materials and energy creating opportunities for the full exploitation of the material. As a result of the study performed in Norway in 2013, the confidence in sawn wood and bio-energy demand and sawmill productivity growths along with international trade growth until the year 2020 is present. (FTP 2013, 3-5, Sjolie et al. 2015, 148, 152.)

Plastics. North & Halden list the benefits of the plastics; its energy- and cost-effective manufacture and bio-compatibility creates continual opportunities for the usage of the material. The concerns over plastics are the petroleum usage as a raw material and the massive quantities of disposable material causing pollution. Again, the separation of various plastics for dispose is challenging. They press for considering the plastic life-cycle in the production. (2013.)

The Finnish Plastic Industries Federation FPIF reports the industry having suffered from the fluctuating prices of plastic and raw materials such as petroleum. In the path towards a sustainable future the industry is considered not only to maintain its existence but enable energy efficiency and environmental-friendly goals through the unique characteristics of the material.

3.2 Foresight Information Identification and Utilization

The foresight process started in the spring 2014 by the foresight information exploration and source identification using Sorama's recommendations; the internet, publications, newspapers, journals etc. from national and international foresight-oriented actors. During the foresight information study the search started to result in confirmative perceptions of the future and therefore the megatrends were recognized.

The study is based on The Finnish Innovation Fund Sitra's trend list for years 2014-2015, consisting of 13 issues it considers as megatrends. The trend list distils the foresight information found in the other sources as well.

Sitra (2015) states that

1. "inter-dependency is increasing,
2. power relationships are shifting,
3. job stability is disappearing,
4. Europe´s structures are crumbling,
5. technology is being integrated into everyday life,
6. skills are challenging information,
7. human lifespans are increasing,

8. communities are empowered,
9. the roles of cities are growing,
10. inequity is growing,
11. well-being is becoming more important,
12. the effects of climate change is broadening, and
13. ecological footprints are outgrowing our “shoes”.”

The scarcity of natural resources is already realized. Wilenius & Kurki state the efficient use of resources to be the key component of competitiveness as the raw material and prices maintain high, the competition hardens and the environmental awareness increases. Therefore, the bio-, nano- and environmental technologies as well as healthcare are rising via digitalization and automation. Innovativeness plays a lead role in sustaining the global competition, adds the European Commission. Innovations in processes, products, workforce organization, life-cycle management and the adaption of new technologies regenerate and restructure the industry. (European Commission 2009, 4, Wilenius & Kurki 2012, 9, 56.)

Häkämies in EK (2015a) recognizes the digitalization and the circular economy as main megatrends and possibilities for growth in Europe, while Store adds the bio-, Arctic- and sharing economies as well as technology to the megatrends list. Along with others, the European Construction Technology Platform ECTP recognizes the future megatrends to be the demographic growth, the climate change and sustainability, where the construction industry is challenged, yet having the possibilities to develop and succeed by focusing on the human needs and values. The ECTP accredits the construction industry being the key sector in realizing the perceptions of the quality of life and sustainable societies. (ECTP, 2015, EK, 2015a, 3, 22-24.)

In the future, the key construction product will not only be the product of ‘a house’ or ‘an apartment’ as it is known today, but a service with a full entity of integrated smart systems. The European Commission identifies the need for intelligent houses as the consumers’ increasing appreciation for the quality of life, security and the climatic change. As answers to the challenges of urbanization, ecology and rising quality expectations the Commission promotes e.g. the mass production of building components with inbuilt technology, the “open building manufacturing”

which takes the production from the building site indoors with an emphasis on the architecture and the use of innovative and eco-friendly techniques and materials such as stone drilling and textiles. Kotilainen & Hedman emphasize the perspective to sustainable residential construction being not only in ecology but the comprehensive human well-being as well. (European Commission 2009, 5, 10, 12, 14, 17, Kotilainen & Hedman 2015, 14.)

3.3 Future Change Drivers Recognition and Definition

The megatrends chosen for a closer examination in the study were digitalization, changes of values and ecology since their indisputable affect on the future customer needs. By the finish of the study Sitra announced its trends list for 2016 emphasizing the fast development of technology, world inter-relations and the global sustainability crisis (2016) convincing the issues chosen for discussion in the study being essential in the future's examination.

Digitalization has changed the communication by enabling the compatibility of different media contents and the power shifts, in a sense of content creation and audience reach, from large media organizations to individuals, states Wilenius & Kurki (2012, 50.). Thus, the Ministry of Employment and the Economy (MEE) (2013, 9), adds the crucial source of growth being the ability to utilize the possibilities of the information and communications technology.

The concept *"values"* for an individual is described by Rubin in Topi Tulevaisuudentutkimuksen oppimateriaali as symbols which guide the behavior, choices and assessments in e.g. decision making and other action in various circumstances, in addition to being fundamentally impacted by the human's needs. In social context, the values are for unifying the society and attempting to eliminate disruptions towards the system. Valuing the individual quality of life changes the business environment via the changes of demand.

As far as *ecology* is concerned, the European Commission points out the massive amount of energy used by European buildings in addition to the industry's use of natural resources and generation of waste. The development of technology and

the pressure of low energy consumption in construction and housing forces, as well as enables the search of novel approaches to construction engineering and implementation in terms of future living. Therefore, in addition to the development of low energy processes, the ECTP calls for the importance of researching innovative materials as well in creating sustainability by their energy performance and durability. (ECTP 2015, European Commission 2009, 4.)

The future change drivers were conducted from the examination of the mentioned megatrends via PESTEL analyses (Figures 12-14). Vuorinen (2013, 222) visualizes the key issues to concern and to have implications for an organization in the figure of the PESTEL analysis (Figure 11).

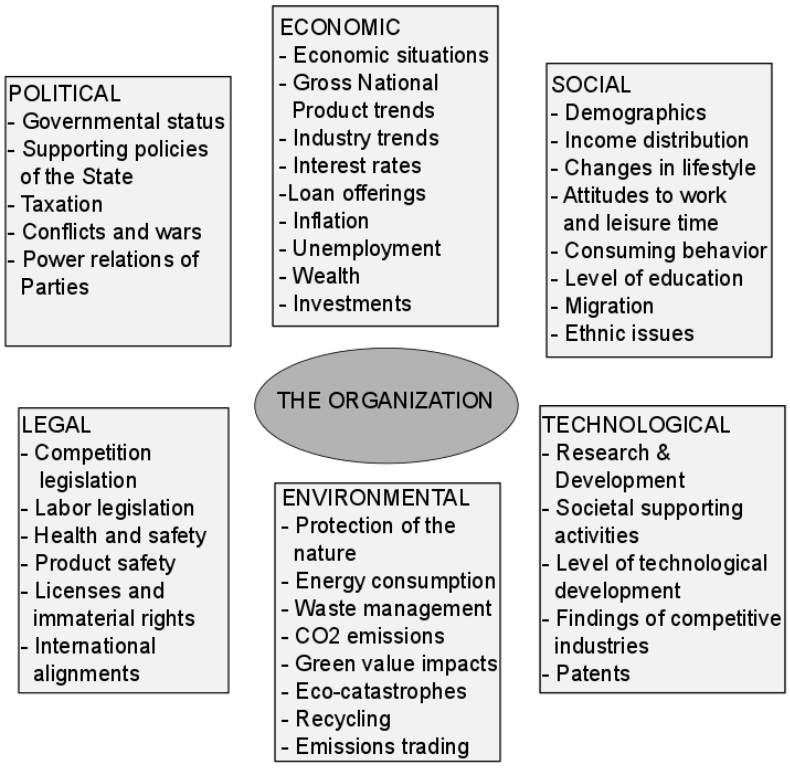

Figure 11. The PESTEL analysis. (Vuorinen 2013.) Edited.

From the political viewpoint, Vuorinen suggests considering issues such as the governmental status, the supporting policies of the state, taxation, conflicts and wars and the power relations of the parties. As it comes to economics, considerable matters are economic situations, Gross National Product trends, industry trends, interest rates, loan offerings, inflation, unemployment, wealth and investments. The recognition of the social implications requires thinking of the

demographics, income distribution, lifestyle changes, attitudes to work and leisure time, consuming behavior, level of education, migration and ethnic issues. The technological implications clarify by considering research and development, societal supporting activities, the level of technological development, the findings of the competitive industries and patents. Environmental issues to take into account are protection of the nature, energy consumption, waste management, CO^2-emissions, green value impacts, eco-catastrophes, recycling and emissions trading. Legal matters that may implicate are the competition legislation, the labor legislation, health and safety, product safety, licenses and immaterial rights and international alignments.

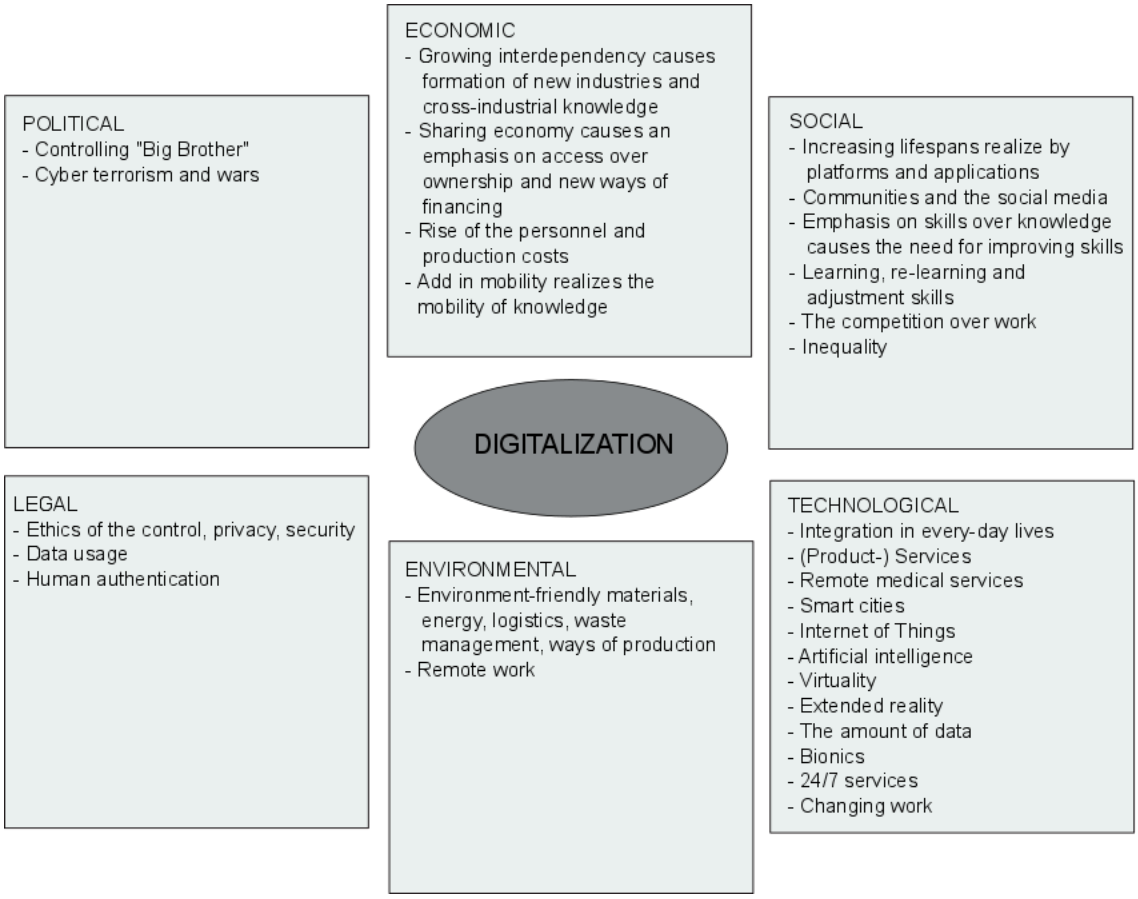

Figure 12. The PESTEL analysis of the digitalization.

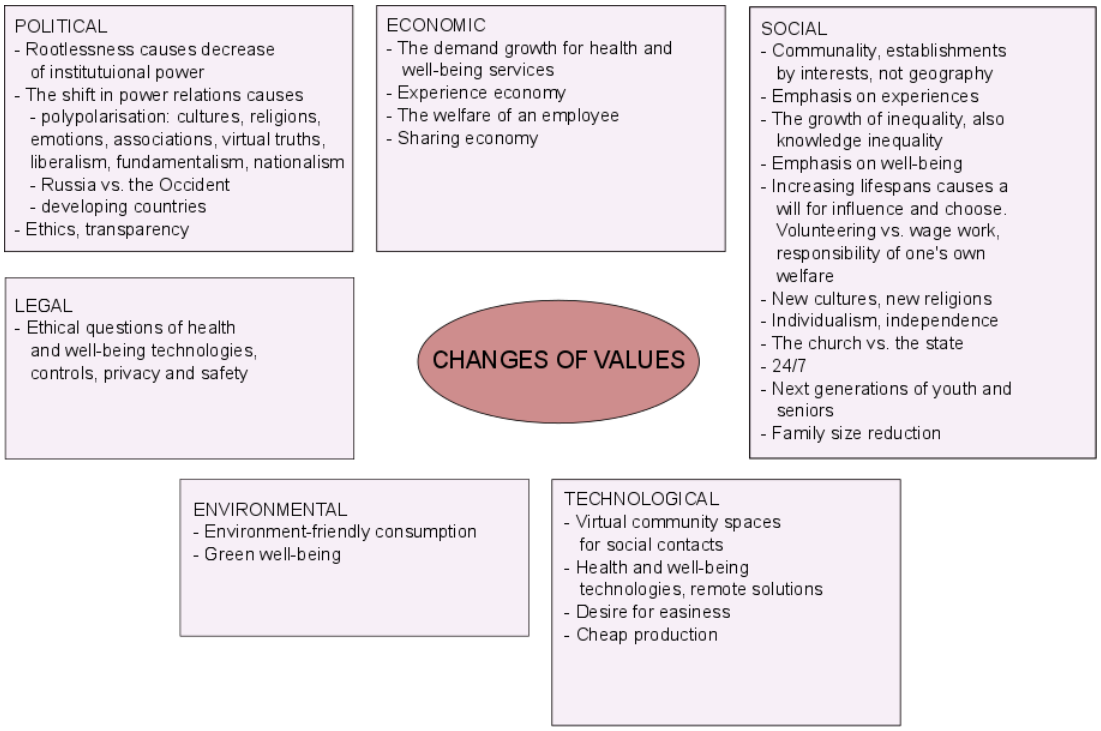

Figure 13. The PESTEL analysis of the changes of values.

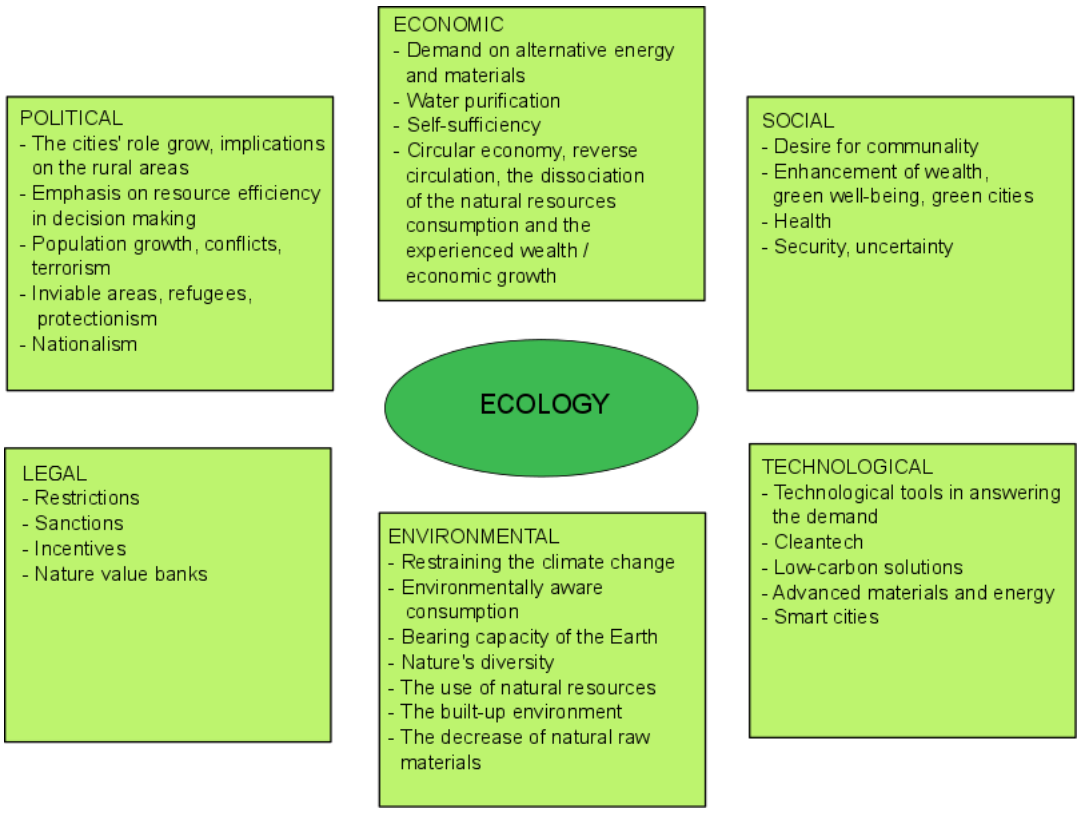

Figure 14. The PESTEL analysis of the ecology.

Via PESTELs, the change drivers were recognized as *automation and robotics*, *service economy, cyber safety, emphasis on well-being, sharing economy, the shift in power relations, circular economy and the decrease of the natural resources.* Each theme was brought to discussion in the key actor interviews and is introduced briefly in following.

3.3.1 Automation and Robotics

Automation and robotics have already assisted and replaced manual work in manufacturing since their cost effective and low error marginal advantages. The idea of the “Internet of Things”, where devices discuss and share data without human involvement, has been acknowledged since the end of the twentieth century. Daecher & Galizia (Deloitte 2015) update the term for “Ambient computing”, which is yet developing and waiting for its full exploitation. Paajanen & Vainionkulma-Immonen in MEE (2015) name production processes and logistics as an example to apply digitalization. What is more, they list new processes the digitalization will enable: new business and working opportunities and models, new larger user groups, new value chains and ecosystems, faster information flow and real-time economy. As a following phase, they describe the platform economy, which Collins & Sisk in Deloitte see spreading and platforms being applicable to products and services in various ways. In fact, they state applications to realize the internet of things and to move the businesses to the next level by the possibility of becoming products or services themselves. They recognize the common problematic in discussions about IT investments and their expected return, however, seeming often invisible and undervalued. (Deloitte 2015, 23-24, 35, MEE 2015, 113-115.)

The internet of things and platforms are entering the building products and creating housing services as well. As an example of intelligent housing, Kotilainen & Hedman mention structure integrated systems with mobile control over domestic appliances and devices, and Daecher & Galizia in Deloitte describe a “conscious home” to offer safety, comfort and savings of energy. The customer and consumer needs drive the product / service design, as Scheibenrief et al. in Gartner remind.

They emphasize the customer engagement at all levels, from innovation processes to market delivery innovations, for the addition of value and competitiveness, particularly in consumer-driven manufacturing. Consequently, with the added services, products become more complex. (Deloitte 2015, 39, Gartner 2015, Kotilainen & Hedman 2015, 46.)

3.3.2 Service Economy

Service is widely recognized as the key element of future business, by itself or integrated with traditional goods, since the customers' desire for easiness and carefree living. The Research Institute of the Finnish Economy ETLA describes the modern economy to base on the service needs and digitalization as well as the determination of consumption to goods production and technologies usage. Already, the industrial production is not solely to be relied on since the competitive advantage rises from the whole value chain and its other parts, says Vapaavuori from the Ministry of Employment and the Economy MEE (2014), adding the demand to multiform as well as the limit between industrial and service production to become more and more unclear. In MEE (2015) Vapaavuori as well as Paajanen & Vainionkulma-Immonen see the growth possibilities via the platform economy and emphasize the service-dominant logic over the traditional industrial goods-dominant logic. The service-dominant logic is explained by Vargo and Lusch as following:

> "-- a mindset for a unified understanding of the purpose and nature of organizations, markets and society. The foundational proposition of S-D logic is that organizations, markets, and society are fundamentally concerned with exchange of service—the applications of competences (knowledge and skills) for the benefit of a party. That is, service is exchanged for service; all firms are service firms; all markets are centered on the exchange of service, and all economies and societies are service based. Consequently, marketing thought and practice should be grounded in service logic, principles and theories."

(ETLA 2015, MEE 2014, 5, MEE 2015, 7, 112, sdlogic.net.)

3.3.3 Cyber Safety

The collection of customer behavior, product usage etc. information, “Big Data”, brings up the ethical question of surveillance with a concern over privacy and personal safety. Cyber security activities and data privacy regulations guide the exploitation of big data, but the virtual data is constantly under a threat of attacks. Furthermore, the privacy management is yet a rather new skill for maturing generations to adopt. Thus, cyber safety in business may seem foreign and undervalued issue which importance grows as the overall business functions increasingly address towards the developing technology. Daecher & Galizia worry over the vulnerability of unsecured data, stating that the connected devices are often physically accessible. In addition, the lack of human control over device-to-device data may have undesired implications; passing the decision-making control to machinery enables them to harm the business. Kark & Vanderslice stress the importance of proactive cyber security involvement throughout the operations and project life cycles especially in actions that concern organizational growth and performance, focusing on the likely threats instead of the barely imagined ones. They remind the continuous management of cyber safety as a part of the risk management to actually add value to the business. (Deloitte 2015, 15, 44.)

3.3.4 Sharing Economy

The sharing economy is an economic model that bases on the ideology of shared production, use and consumption in order to restrain excessive consumption. Not only products are shared, but knowledge, time, money and other resources are being exchanged and accessible. The technological progress has forwarded the sharing principals via novel networking possibilities, in addition to changing values that promote usage over ownership and saving both money and the environment. To succeed, such communal activity requires shared values and trust. As a consequence, the sharing economy has already engendered new businesses and the growth of funding options. (Jakamistalous.fi.) PricewaterhouseCoopers describes the sharing economy model to consist of four elements: digital platforms that enable the real-time supply and demand, transactions for access over owning,

consumer collaboration and branded experiences for engaging emotions. In their opinion, the mature industries need to carefully assess the sharing economy implications for the business. To profit, PwC recommends activities such as the recognition of the customers' values, reassessing the business model and the resources, embracing change, offering sustainable quality and the reputation management. (PwC 2015, 15, 20, 22, 24, 28.)

3.3.5 Emphasis on Well-being

According to Kotilainen & Hedman, one of the major future societal changes is the individual's freedom of choice which leads, amongst other, to the diversity of housing. As a result, the acceleration of the urbanization has already changed the housing needs from family homes to smaller apartments especially in urban areas. On the contrary, the housing costs may drive individuals for communal options. The ageing population with the ability and willingness to reach for the maximum quality of living create the demand for customized and upgraded goods and services, including residences. The wider understanding of the relations between health and the built surroundings as well as the progress of advanced solutions for domestic health care offer enormous potential for the development of the residential building. However, the inequality rises as the differences in individual income deepens making the social exclusion and experiences of loneliness more severe. The Finnish Government agrees on the growth of wage disparity, presenting Heikkilä to stress on the disappearance of the middle class. As a consequence, the economic growth decelerates and heads towards crises. (The Finnish Government 2012, 21, 35, 88, Kotilainen & Hedman 2015, 42, 44-46.)

One of the major trends to consuming is experiences. Already in last century Pine & Gilmore (1998) introduced the concept of "experience economy" they saw emerging as customers seemed to desire experiences. They stress the value of experience in every business activity from the manufacture of commodities to the offer of services extended to the point where the customer is willing to pay for the access to the experience and thus for the initial goods / services. The shift towards the experience economy has been noticed and taken action already in several

business fields and it has additionally created totally new businesses. However the concept's application to the industrial environment is yet to be assimilated and implemented.

3.3.6 The Shift in Power Relations

The shift in power relations is happening at levels such as individual – group – institutional power, cities – non-urban areas, regional – state politics and developing – advanced economies. The development and influence of urban areas steadily grow and the European Commission sees it having bidirectional effects; the cities are economic centers and nests of innovation and creativity, solving yet simultaneously causing social, economic and environmental challenges. The Forum for the Future states the trust in institutions to diminish however, due the public financial decisions and the promotion of peer-to-peer (between individuals) trading activities as well. Likewise, the Finnish Government worries over citizens' trust in economic institutions. Referring to a study performed by Kahma and Takala in 2012, it presents the trust in others being low amongst those with lower education, correlating to trust in institutions. Heikkilä points out the increase of conflicts and catastrophes to continue. (European Commission 2016, The Finnish Government 2012, 12, 74, 90-91, Forum for the Future 2013, 8, 14.)

The global economic power shift is expected to realize, raising developing countries such as Brazil, Russia, India and China (BRIC) to the economic lead, informs Forum for the Future. The emerging markets are anticipated to be taking over the major share of economic activities for 2025, basing on resource markets since the industrialization and the need of grain. Conversely, the Finnish Government sees the problematic of economic development in non-democratic country such as China, in addition to the elite interests of Russia, hence regarding conservatively towards the expectations to their economic lead. It admits the change happening though in the economic statuses of the superpowers. (The Finnish Government 2012, 37, 39, 67, Forum for the Future 2013, 7, 12.)

3.3.7 Circular Economy

The circular economy is described by the Ministry of Environment as the total use of resources through the whole product life cycle. The aim is to eliminate waste and the use of non-reusable materials by pre-designing the raw materials' path to the afterlife of the product. In addition to waste prevention, the target is on energy production, re-use or recycling, underlines the Federation of Finnish Technology Industries. To realize, the companies need operative networks. The European Commission is currently forwarding circular economy in the EU through four perspectives: supporting better product design, creating incentives and promoting improved production process and innovative industrial processes, to meet the waste management targets set for 2030. (FFTI 2013, 2, 13, European Commission 2015, 1, European Commission 2016, Ministry of Environment 2016.)

3.3.8 The Decrease of Natural Resources

A known fact is that the Earth cannot withstand current consumption and exploitation of its nature. According to the Federation of Finnish Technology Industries FFTI the water and energy shortage realize raising material costs causing the escalation in searching for novel manufacturing techniques and services. The Finnish Government adds oil demand in the near future to stay superior to supply and presents Haukkala worrying over the political implications of competition for the environmental resources in the means of the dominance of state-owned and global companies care for nature. The FFTI states design to delineate 70 – 80 % of the product's environmental impacts during its life cycle, proposing efficiency in the use of materials as a nature, climate and costs saving practice. (FFTI 2013, 7, 10, 24, The Finnish Government 2012, 60, 84.)

For diminishing manufacturing's negative environmental effects in the United States, conservation banking, or "ecosystem service markets" as BenDor, Guo & Yates present it, was launched in the late 1980's as a "no net-loss" program to protect wetlands and streams. The idea was to offer credit for manufacturers who take harmful actions towards wetlands and streams, to compensate the harm in protecting similar environment elsewhere. Kniivilä, Kosenius & Horne present

additionally approaches to environmental compensation holding a conservative position on success in mentioned practices in Finland and in EU area. The FFTI, however, believes in the market orientation and incentives instead of authorial regulations as a change driving force. (BenDor, Guo & Yates 2014, 496-497, FFTI 2013, 13, 21, Kniivilä, Kosenius & Horne 2014, 4-6.)

3.3.9 Key Actor Interviews

The target of the key actor interviews was to gain organizational evaluation and perspectives to the described future themes. The actors chosen for the interviews were mainly export-stressed and cover different building product industries in the region: log houses, CLT elements and components, aluminum and steel products, molded plastic and carpets and outdoor surfaces. Furthermore, a future-oriented start-up company of CLT house element manufacture as well as a local hardware store were chosen to add perspective. The key actors were contacted in weeks 45 to 47 in 2015, and seven of the nine actors chosen were willing to participate in the research, leaving out the carpeting / outdoor surface industry. The actual interviews took place in weeks 46 to 49 in the participants' organizations and were conducted as individual interviews using a semi-structured questionnaire (Appendix 2.). The interviewees were the executive personnel of the following organizations: Finnlamelli Oy, Oy Kohiwood Ltd, Ruukki Construction Oy, Mäkelä Alu Oy, Plastec Finland Oy, CLT Finland Oy and Rautia Alajärvi.

At the beginning, the interviewees were asked to give the basic information of the organization, its products and services as well as its sub-contractors and customers for understanding the organization's business and relations. Next, the interviewees visualized the development of their industry in the becoming 10 to 15 years both from national and global perspectives. The future of the industries' national development was seen as

- stable, but slightly positive since the recovery expectations of the Finnish market as well as the rise of the industrial investments
- successful since the ecologic awareness is re-shaping the governmental guidelines on construction

- secure since the unyielding status of the construction industry
- challenging, the competitiveness and good products enable growth, and
- negative since the local nearly unsubstantial public and private investments and construction conditions as well as the effects of the demographic changes.

The global development of the industries was foreseen as

- having tremendous potential especially in Eastern Europe, Baltics and in Scandinavia, but an extreme competition as well. The export enables growth
- expecting, in the means of the cancellation of the economic sanctions of Russia
- going forward since the cost-efficiency and the experience economy
- opening new markets for bulk products, and
- successful since the ecologic awareness.

The first introduced megatrend was digitalization, and the themes brought to discussion were automation and robotics, the service economy and cyber safety. The opinions and issues of automation and robotics including the internet of things, the platform economy and intelligent housing were following:

- robotics is already replacing routines and work that requires lifting and is yet to increase in every phase of the product life cycle, in the bulk production and in the extractive industries, as long as the cost-efficiency stays at the competitive level
- the production systems are required to register data to fulfill the quality certificates and standardization needs
- the requirements of the knowledge increases
- the effective exploitation of the automation is necessary
- work safety increases by monitoring
- the “Internet of Things” will realize more rapidly than the intelligence in housing

- production control, monitoring and product life cycle control systems will develop
- platforms are used in production and energy control, sales and customer contacts
- platforms have enormous potential, for example decreasing human role in work
- solar energy control and exploitation develops, affects every housing product and the pricing will become reasonable
- the intelligence will become a crucial part of the product / service / customers' product
- the technical building engineering, the maintenance of the product and usage monitoring increase causing price rationalizing
- new products, services and businesses emerge and thus develop the intelligence in housing
- effectiveness in energy and resources, registration, measurement, adjustment and control increase in housing
- the customer respond to technical building engineering solutions is positive yet the technologies need to develop by becoming user-friendly instead of basing on engineer logics
- enabling systems in the product is necessary
- intelligence affects the whole value chain.

The discussion about the service economy including the themes of technologic / service innovations and the customer as a designer brought up following topics:

- The customers are more willing to use services, however, not necessarily willing to pay for locality or quality
- Services are the key of the business; customers change and the production needs to adapt in customer-oriented means
- Service offering possible through digitalization / mobilization and operational networks
- Production is a necessity alongside to the service offering

- Law enforcements on housing product maintenance would add the local service demand
- The competition of the sales closure hardens since the customers are more price conscious than brand loyal
- Companies need to invest in turning service into a product and product launching
- Product / service innovations throughout the product and the product life cycle
- Web and mobile sales in B-2-B activities
- The constant update of customer segments
- The customer need recognition and involvement needs to appear in the earliest stage possible (design) by discussing the essential issues with the key persons
- The concrete exploitation of the customer data; foresight, data analysis and customer insight from the end customer utilization in the product / production / service design
- Foresight in technical data, e.g. fire / energy regulation changes from the constructor enables focusing and gaining cost-effectiveness which advances marketing and sales
- Crowdsourcing in product development.

The thoughts of the digital safety theme, including cyber safety, control and ethics, are represented in following:

- The concept of “safety” is defined by the safety experience of the end user
- By the perspective of safety the digitalization is mainly seen as a risk in order to abuse, such as plagiarism, customer data and product detail usage. However, the enormous amount of the data complicates the effective exploitation for abusing purposes
- The control of the product usage should take place in order to clarify the responsibilities of the manufacturer in case of misusage as well as to define the actual emissions concerning e.g. energy consumption

- The ideal usage of the product, e.g. temperature / energy consumption should be compensated via real estate taxation easements or premium discounts
- The responsible actor of the control; the manufacturer or an authority
- Ethical issues will exist, the detailed contracts of data collection and usage are the key; the customer's approval for control eliminates the risk.

The second megatrend discussed concerned the consumers' changing values including the themes of sharing economy, emphasis on well-being and the shift of power relations. The sharing economy topic was conducted by the viewpoints of ownership vs. usage, ecological consuming and changes in funding. The following issues emerged in conversations:

- The ownership will not be a desired value
- The financial industry will advantage
- A possibility for business as the financial risk of the customer decreases, and as the usage preference causes detailed resource optimization
- Will direct the production via the reduced size of a house / apartment
- Will reduce the overall market size
- Small neighborhood construction with shared real estate maintenance services etc. increase, but is relatively expensive
- The ecological consuming forwards the product development and the research of new ecological materials to substitute non-environmental matters
- The recognition of the positive CO_2 effects of wood increases the material usage
- The opportunity lies in the assistance of customer's funding both in B-2-B and B-2-C sales.

The discussion about the emphasis on well-being consisting of the topics "experience economy", "new generations of consumers" and "the growth of inequality" engendered following viewpoints:

- Easiness in living and in using services, e.g. the web stores vs. physical shops, the paid services of leisure, mobility

- Bases on the end-user data collection
- Valuing the money itself decreases, as well as the physical environment through the global data transfer
- Values will change in fast phases
- Temporary work becomes desired over permanent positions
- Safety guides the decisions; however the perception of “safe” may change
- Opportunities in personal safety equipment
- Experiences, perceptions are the basis of the product / service, marketing and sales and needs to fulfill the customer expectations
- Travelling becomes easier and as an experience will challenge owning
- The next consumer generations are both an opportunity and a threat for construction since the leisure home construction decreases; however, the total cost of a house rises
- The rise of the wealth and the willingness on spending money
- The ability to make the ecological decision through the wealth may forward the establishment of nature value banks
- The B-2-B customer demand changes via the end-users’ value change
- Purchase decision criteria change, segmentation guides the production
- The product’s ability change along with the changing needs
- Dwelling for elderly with well-being services, home care funds should be raised to grow the business
- The inequality growth is constant and smooth.

The next topic for discussion was the shift in power relations related to following subjects: urbanization and the availability of personnel, regional vs. national politics, developing countries and conflicts. They brought up matters such as

- The need for correction to the current monopolistic status of concrete in the new regional building in order to timber’s access to the markets
- Strong belief in the non-urban living and remigration exists
- The non-urban industries’ power to change the direction of migration
- The urbanization does not affect on solid client base especially in Finland

- The products must change when the housing changes; the emphasis on the recognition of whether or not to react
- The construction will center around smaller geographical areas and to apartment construction
- Improving the local competitive advantage needs emphases on regional marketing, maintaining the level of local services and rationalizing the land use for the benefit of both businesses and residents
- Urbanization challenges the recruitment of a knowledge-based work force and it may affect the future position of the production
- The competitive advantage of the employer will suffer from the higher personnel costs caused by urbanization added to the high costs of the logistics in the non-urban area
- The industrial locus of the area needs to be seen as a regional asset and the service offerings to employees adjust accordingly
- The remote work utilization
- The regional politics will override the national politics and the need exists, rises from the initiation of the non-urban regions since the high diversity of geographical regions
- The regional politics will not gain status that will remarkably affect the highly conservative construction industry nor the global companies in it
- The growth of the developing economies create possibilities as the middle class gains wealth and as the perceived level of wealth originates from the certain level of consumption thus changing the economic emphasis
- The growing markets are in Eastern Europe, Africa and in South America but they will not gain economical dominance, and the protectionism decelerates growth
- The new markets are not yet familiar or politically stable and the competition increases correspondingly to growth
- The developing countries create transient market distortion by lower costs but as the rapid development stagnates the prices heighten, import becomes more profitable and the markets settle
- The developed countries will decline
- The unsteady situation in Russia will settle

- Conflicts decelerate growth, however the latter effects are positive since the post-war growth
- The international relations improve due the joined battle over terrorism
- The mass movement of people brings opportunities
- The concern over ecological disasters, energy production and fresh water shall be considered, and
- The anticipated changes in the economy earn less respect than the organizational discretion.

The final concerned megatrend was ecology which was examined through the subjects of circular economy and the decrease of natural resources. The circular economy discussion included the maintenance, the prevention of waste, value recreation and the product life cycle themes and resulted in following mentions:

- Ecology gives competitive advantage
- A massive effort has and will be put into ecology in forms of material recycling, emissions reduction, energy consumption and waste management
- Considering the energy efficiency in residential construction the costs of component and energy production and logistics need to be included
- The construction costs would be reduced via the optimization of the end consumption; the isolation requirements are often over scaled
- The increase of wood usage in construction may occur bringing opportunities for competing materials as well
- The production of plastic is both cost-efficient and eco-friendly
- The circular economy to realize requires focus on the logistics; in transport, in production and in stocks
- Maintenance actualizes via digitalization
- The value recreation materializes in wood products as the material is both durable and ecological, the demolition is painless and as the innovations regarding chemical pulp brings opportunities
- The customer data gives signals to the product re-value development
- Possibilities to value recreation via networks, and
- The durability of steel.

The conversation on the decrease of natural resources and the nature value banks disclosed following opinions:

- Wood as a construction material will be used and the strength lies in its renewability, positive effects on climate and availability, causing an increase on the constructional usage in addition to the composite raw material usage
- The Nordic forest industry's sustainability gives secure, and the material exploitation is rational
- The effects of wind and hydroelectric power production are unknown
- The nature value banks are considered positive since the search for advanced materials and probable due the Finnish governmental alignments
- The realization will affect on the steel industry through the mineral, chalk, concrete and bauxite quarrying and hence on wood usage
- The burning of wood may be prohibited
- The actual advantage of nature value banking may not exceed the causing costs to a single actor
- The equality in the banking practices in the global scale is nearly unobtainable and may lead to the production transfer to low regulation countries, and
- The incorrect use of the product transcends the negative effects of the production.

At the end of the discussion, the interviewees were asked to name themes that already affect or will affect their business and / or industry significantly in the future, especially if not brought up by the interviewer. The emphasis was on

- authoritative regulations
- customer data / customer insight exploitation
- the creation of desire
- the effects of international conflicts when entering new markets
- digitalization and the changes of value
- ecology and energy regulations
- the conservativeness of the industry, and

- the local demand and the regional decision-making including lot policies and landscaping.

The interviewees were inquired for the willingness to participate in the Focus Group work and offered date suggestions for the becoming weeks. Although the reception was positive at the time, the enrolment was unsubstantial. Thus, the Focus Group did not realize.

3.4 The Cluster's Future Recognition and Analysis

The interviews were analyzed using the Futures wheel, the PESTEL analysis and the Opportunities and threats analysis for the recognition of the cluster's future.

3.4.1 The Futures Wheel and the PESTEL Analysis

The continuous strategy process representation recommends using the PESTEL analysis for the classification of the future change drivers' impacts. First, the study in hand used the Futures wheel introduced by Hiltunen (2012, 212-213) for the recognition of the two level impacts of the change drivers. Hiltunen's Futures wheel is presented in the following figure (Figure 15).

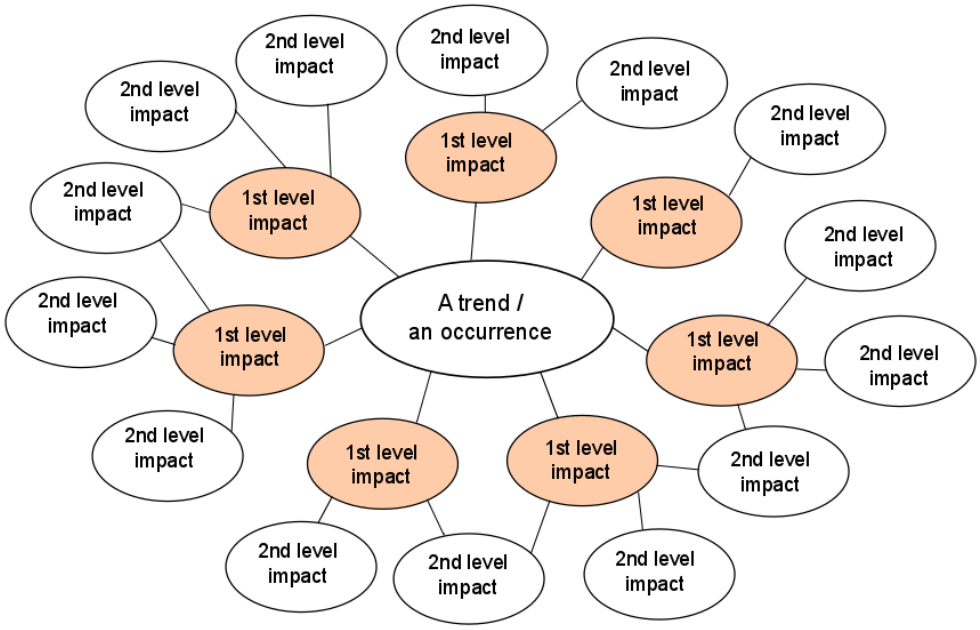

Figure 15. The Futures wheel. (Hiltunen 2012). Edited.

As mentioned, the study in hand used a combination of both, the futures wheel and the PESTEL matrix mix as the visualization tool for the recognition of the first and the second level effects represented in the following figure (Figure 16). In the figure, the centered triangle demonstrates the future change drivers and the inner circle illustrates the implications discussed of the change drivers analyzed via PESTEL. The second level effects are put into the outer circle again in a PESTEL form. The key implications to the cluster, conducted from the second level effects, are listed below the figure.

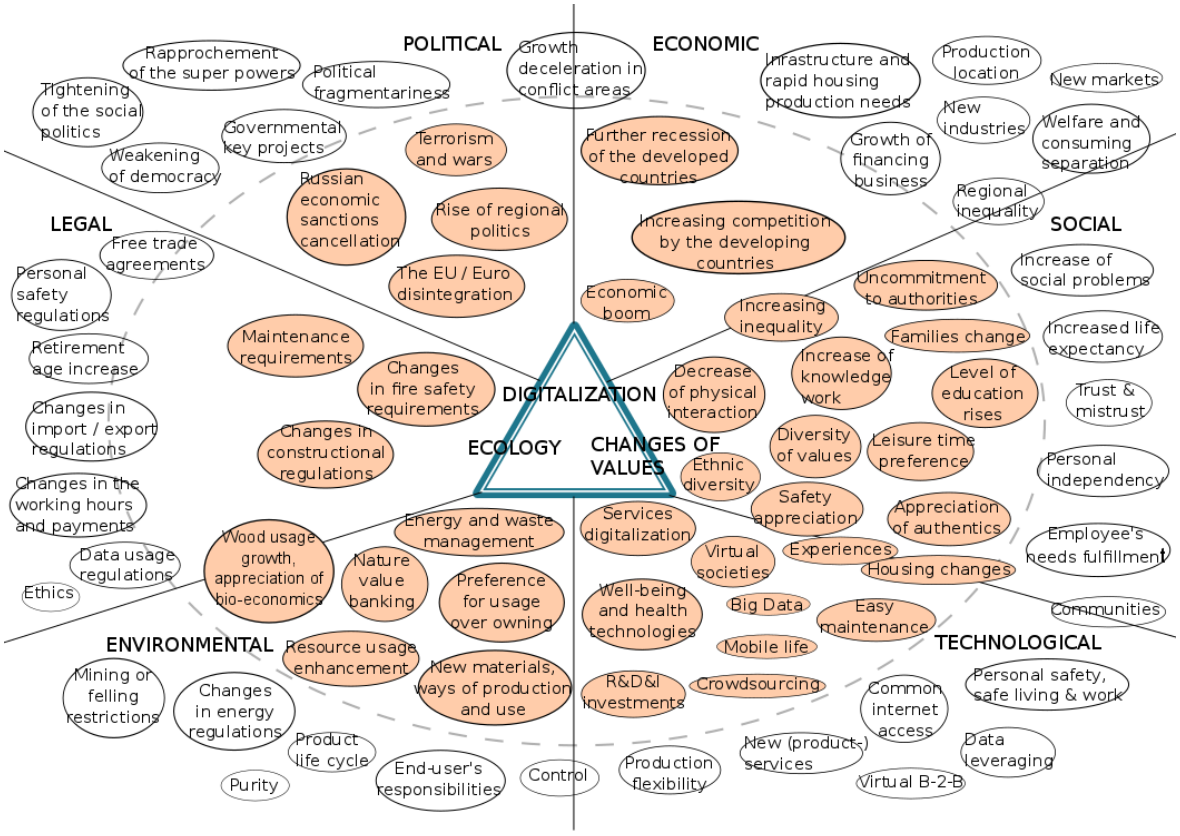

Figure 16. The Futures wheel – PESTEL mix.

Political implications

- The governmental key projects set the focus on economic growth
- The counter-terrorism activities draw super powers closer.

Economic implications

- Conflict areas suffer from growth deceleration, yet have a need for rapid infrastructure and housing production
- The growth of developing countries create new markets
- Digitalization, ecology and changing values create new industries
- The rise of regional politics and regional level of education affect on regional competitive advantage, causing regional inequity
- Environmental regulations, emissions trading, labor policies and regional competitive advantage affect on production location
- Preference for usage over owning causes reduction on the whole market size and growth of financing industry.

Social implications

- The increase of foreign employees affects the organizational culture & language
- The level of education in the area does not meet the requirements of the future work life and it causes competition over skilled knowledge workers
- Money and owning lose their significance as a value and experience of welfare separates from consuming causing changes in consuming behavior
- Desire for easiness accelerates services demand
- Decreasing physical interaction in business causes trust issues.

Technological implications

- Customer data collection increases and is not completely leveraged by the businesses in the cluster
- Technologies enhancing health, well-being and safety reach the customer
- Rapid reaction to market changes ensures competitive advantage
- Business-to-business activities become more and more mobile / virtual.

Environmental implications

- Energy and waste management causes changes in energy regulations
- The energy regulations apply to the end-user's responsibilities for the correct product use, setting the focus of the energy consumption on the whole product life cycle and adding control over product usage
- Protection of natural resources causes restrictions over usage, such as mining and felling restrictions
- Appreciation of authentic causes a search for purity.

Legal implications

- Political turns cause changes in importing / exporting regulations and free trade agreements
- Social politics affect on working hours and payments
- Data usage regulations affect on the customer data collection and leverage as well as the control over consumer behavior

– Trade and data usage regulations as well as social politics raise ethical questions.

3.4.2 The Opportunities and Threats Analysis

The opportunities and threats analysis is a part of SWOT analysis, focusing on the issues in the business environment. (Vuorinen 2013, 88.) The issues are examined and presented in the following table (Table 2). The results of the analysis are opened up by applicable parts in the following paragraphs and in the Recommendations chapter (Chapter 4).

Opportunities	Threats
- Wood usage and bio-economics growth - The governmental support via the key projects - An access to the post-conflict reconstruction - Value adding production - Resource usage enhancement - New markets from developing countries - Entering in new markets and industries via digitalization and networks - A regional competitive advantage by the rise of regional politics - Promoting health, well-being and safety in the product - The image of Finnish quality and technology knowledge - Creating services around the product	- Growth of the developing countries adds competition - Reduction of the whole market size via preference for usage over owning - The level of education - Restrictions on natural resources usage - Nature value banks / emissions trade implications for single actors - Industry's conservatism.

- Mobile / virtual B-2-B - Customer data leverage - Enhancing the reaction speed to match the changes in the customer demands.	

Table 2. The opportunities and threaths analysis.

3.4.3 The Future Customer and Housing in 2025

Based on the foresight study the future customer and housing will polarize further depending on the societies' progress and wealth. As technology continues to integrate deeper in every function of living and as the values guide the customer behavior by the ability to choose, the solutions with quality and conducive to ecology and health lead both human and technological service supply as well as the customer decision making from smaller purchases to greater accessions. Sustainable consuming thus increases causing reduction to the number of product sales. The wood usage growth in construction and energy production starts to raise a question of wood felling restrictions in the means of preventing an overuse of the particular natural resource, leading to a constant new materials search. The development applies throughout the Western countries.

The known "Finnish dream" of a single-family house, garden and privacy remains, but the demand for easy and care-free living adds the services spending to the former product spending. The net floor area reduces since the demographic and living expenses change and as the low-income population suffers severely having limited options for housing requirements. In addition, the popularity of communal housing increases as a consequence of the appreciation of ecology, will for independency, search for security and increased expenses, making ownership status become less meaningful and thereby giving birth to various novel owning, financial and exchange practices. The innovators create novel housing options to meet sustainable and individualistic requirements.

The urbanization adds the constructional focus to cities and their surroundings, but the rise of the regional politics enables meaningful living outside cities as well, mostly by the assistance of technological service solutions in business, working life and public services. The multicultural population adds challenges to the work life in the means of interaction and organizational cultures, yet it answers partly to the need for work force. Hence, the “Finnish” values transform decreasing the appreciation of domestic products as such. Nonetheless, the quality, health and ecology of the Finnish products and production carry in the global competition.

Globally, the size of households decreases as well, by the urbanization and the rising level of education. Since the growth of wealth adds consumption through the experience of well-being, the developing countries’ markets temporarily grow. At first, the housing quality, inbuilt technology and services do not play a major role in customer demand, but the increase of wealth, the adaption rate of the novel technologies and care for the environment add housing requirements in the developing countries.

3.4.4 The Ten-year Future Outlook for the Building Product Industries in the Area and The Future Change Drivers that Force the Formation of a Cluster for Innovative Practices Meeting the Future Customer Demands

The region will suffer from the demographic changes that reflect especially to the small and medium sized industrial companies which are the foundation of the business environment in the Järviseutu area. The environmental regulations, emissions trading, labor policies, the recruitment of competent work force and regional competitive advantage will impact on profitability and eventually on the existence of the businesses and their production location. The megatrends of digitalization, ecology and changing values in the forms of advanced daily life robotics and service platforms, environmentally aware consumption and the appreciation of health and safety create new requirements for businesses, in addition to new industries to compete with. Therefore the companies need to actively seek multi-range co-operation for gaining an access to novel opportunities

to add in the business for survival. As the business-to-business activities become more mobile and virtual, the decreasing physical interaction in business causes trust issues.

The supportive actions of the government in the form of regulations will further enhance the wood and bio-based materials and energy usage. Public construction thus adds the wood and wood product usage domestically. As the European Union shares the aspect, the wood construction will grow progressively in Europe and in aware countries, yet the construction in general is low. The focus will be on the public construction, small residential construction and renovation work and on the creation of dense, compact and affordable housing, as the demand for single-family housing diminishes heading to the lowest levels in history. The ecological materials will challenge steel, but in ten years time steel maintains its powerful status in urban construction. What is there to notice, it is not impossible to mining or wood burn to be restricted in the next ten years slowly changing the statuses again. As for the energy regulations, the concern over energy consumption will grow, and with the assistance of the developing technology the control over product's appropriate usage attracts attention, finally causing the spread of the energy consumption burden to the product whole life-cycle including the end-user. Anyhow, the customer data collection and utilization increases by the slow ethical acceptance of the personal control shift to the authorities. The foresight-oriented data exploitation by rapid reaction to market changes thus enables the competitive advantage.

New construction markets rise from the Middle East and developing countries in Europe, Africa, South America and Asia. The economic sanctions cancellation towards Russia turns the Russian market to growth again, unless another enter into a conflict. The conflict sensitive areas require a cautious approach. They suffer from growth deceleration, but have a need for rapid infrastructure and housing production. However, the political turns, as well as eco-catastrophes change the markets, practices and importing and / or exporting regulations rapidly.

4 RECOMMENDATIONS

In the light of the study findings, the matter to pinpoint is the insurance of the Järviseutu regional competitiveness in the global operation field. The competitive status is gained through *a regional image renewal through the public and private service supply* and *the corporate resource efficiency through networks* including the following activities:

1. Service offering, productization, branding and launching.
    - Creation of a joined (service-) / (technology-) product to add on the housing product(s) by the exploitation of the different service providers in the area, e.g. mobile business-2-business solutions, virtual home experience or real-time home construction / element production surveillance, maintenance contract housing or financing offerings.
2. Joint marketing and the creation of demand.
    - Customer data collection and crowdsourcing, constant foresight-oriented trend analyses and data exploitation in research & development, marketing and production. Promotions of the product quality, ecology and health / well-being.
3. R & D activities and production flexibility.
    - Early stage trend observation turned into rapid product and service offerings .
    - The value addition of the recycled product.
4. Resource ecosystem.
    - The full exploitation of the material and immaterial resources of the region, including knowledge sharing and shared work force through the innovative ways of work.

What is remarkable is the existence of the networks in the area as well as the will for co-operation. However, the conversation needs to be steered even further to the joint activities of digital service offerings alongside with the product and the share of knowledge. Additionally, the higher level education in the area needs to correlate accurately and flexibly with the exigencies of the businesses even in the

minor scale to assist in meeting the mutual benefit. The open mindset and foresight-oriented observation over multisectoral competencies must be intense and constant in the search and execution of synergies.

For further action, the study recommends a closer look for the cluster's strengths and weaknesses from the perspective of the mentioned co-operation opportunities, by following the Continuous strategy process introduced in Chapter 2.3.5. The starting phase of research would be the VRIO matrix analysis for the identification of the resources that create competitive advantage, followed by the TOWS matrix and three horizons strategies, on the path to the recognition of the worthwhile and precise actions for the cluster's development.

5 CONCLUSION

In conclusion, the Cluster Foresight Model combined with the stages of the Continuous Strategy Process offered a practical tool finding the answers to the main questions of the study and thus reaching the research goal. The model is applicable in any business as a basis to a strategy work and should be in constant use. As a development tool it offers information on matters relevant to further investigation in the whole operational environment of the industry or the cluster. Better yet, if the becoming changes in the cluster are related in industries that do not obviously correlate with the studied cluster. Since the industrial nature of the Järviseutu region, it did not realize in the study in hand.

Studying and applying the Cluster Foresight Model to the actual business environment was challenging, yet extremely interesting. Personally, the challenges related to the feel of limited familiarity with the business life in the region, causing massive uncertainty at times. For the relevance of the study it would have been important to get interviews from all the companies chosen, as well as succeed in uniting the interviewees in the Focus Group for more accurate future image formation. However, the strength of the external observation was that it enabled the unlimited and objective exploration of the businesses and their future opportunities. Studying the entire cluster instead of a single industry gave more comprehensive perspective to the business environment. As it comes to the foresight process, the challenge was to recognize the reliable information sources amongst all the future predictions available. In addition, the foresight information did not significantly differ right from the start, despite the source. Thus, the vision of the main trends to observe clarified rapidly. The endeavor to catch the rising trends behind the obvious was problematic.

The study learned a foresight-oriented mindset that was not familiar before for the student. Again, it raised enthusiasm for trend observation and further learning of future customer behavior and customer data analysis to own competence to utilize in personal future work life. The commissioner of the study was very pleased for the research findings and the results were taken into action immediately. Therefore the study was granted by its usefulness in the regional business life.

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APPENDICES

APPENDIX 1. Theme Interview Questionnaire

TEEMAHAASTATTELU 1.12.2015 1(2)

Teemahaastattelun tavoite: Haastatellaan alueellisen rakentamiseen liittyvän klusterin avaintoimijoita tulevaisuuden muutosvoimista.

Haastattelut: vuonna 2015 viikoilla 46-49, 8 avaintoimijaa, puolistrukturoitu teemahaastattelu

Haastattelun eteneminen
- kesto 1 tunti
- avaintoimijan omassa organisaatiossa
- kysytään lupa äänittämiseen

Haastattelun sisältö:
- Kerrotaan lyhyesti projektista ja sen tavoitteista. Pyydetään vastaajaa miettimään asioita sekä oman organisaation ja sen arvoketjun että asiakkaan ja loppukäyttäjän kannalta.
- Kirjataan kohdeorganisaatio, haastateltavan nimi ja asema sekä avainpalvelut.
  Organisaatio:
  Vastaaja:
  Asema:
  Sijainti:
  Avaintuotteet / -palvelut:
  Organisaation kumppanit:
    - Toimittajat ja asiakkaat?

- **Toimialan kehitys 10-15v. aikajaksolla**
    - kotimaassa
    - globaalisti

Pyydetään haastateltavaa kertomaan mielipiteensä seuraavista megatrendeistä johdetuista teemoista.

Teemat ja ajurit:

<u>Digitalisaatio</u>

Automatisaatio ja robotiikka
- esineiden internet
- internet-alustat laitteiston pohjana
- älykäs asuminen

Palvelutalous
- Teknologiset ja palveluinnovaatiot
    - asiakas palvelun / tuotteen muotoilijana

Turvallisuus
- Kyberturvallisuus

- Yksityisyys vs. kontrolli

- Eettiset kysymykset

Arvomaailman muutokset

Jakamistalous
- Käyttö vs. omistus
- Ympäristöä säästävät kulutustottumukset
    - vaihdanta, lainaaminen, vuokraus, myös aineettomat hyödykkeet
- Uudenlaiset rahoitusratkaisut

Hyvinvoinnin korostuminen
- Kokemuskeskeisyys
- Uudenlaiset kuluttajien sukupolvet

Valtasuhteiden siirtyminen
- Kaupungit
    - työvoiman saatavuus, työttömyyden vaihtelut
    - alueellisuus, paikallinen päätäntävalta
- Kehittyvät maat
- Maiden ja eri ryhmittymien väliset konfliktit, massaliikehdintä

Ekologisuus

Kiertotalous
- Huolto, uudelleenkäyttö, uudelleenvalmistus arvo säilyttämällä
    - jätteen synnyn ehkäisy
    - arvonluonti lisäpalveluilla ja älykkyydellä
    - tuotteen koko elinkaari

Vähenevät luonnonvarat
- Luontoarvopankit

Pyydetään haastateltavaa kertomaan mikäli mieleen nousee muita jo olemassa olevia tai tulevia yrityksen toimintaan / toimialaan vaikuttavia tekijöitä joita ei ole mainittu.

Kerrotaan Focus Groupeista ja pyydetään vastaajaa osallistumaan johonkin seuraavista tilaisuuksista: 8.12., 11.12., tai 15.12. klo 13-15.

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