

## **Sustainable Workwear Label - Business Feasibility**

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<p>Can a sustainable protective workwear label be a profitable business for a start-up company aiming at targeting forest industry in Finland? This is the research question, which is tackled with business planning methods. The research outcome, feasibility analysis of a business opportunity, serves the researcher's own organisational needs.</p> <p>This study's literature and information sources are presented and limited as follows: Theoretical framework consist of business planning and market analysis theories. Conceptual framework holds in: Occupational Safety introduction as it is the trigger for the business idea. Workwear industry is presented analytically, as it is the target business industry. The empirical part feasibility analysis concentrates to protective workwear. Forest industry cluster in Finland, is chosen as target customer market, thus other prospect industries are not studied for the business idea purpose. Sustainability (nature sparing circular economy aspect) is presented solely from the perspective of how it can provide opportunity for the business idea in question. Protective workwear currently is a burden for nature since it is fabricated of oil based polyester which takes 200 years to decompose – this justifies re-searching solutions to mitigate the waste burden.</p> <p>The key finding of the research is that shift in global economic power towards emerging economies leads to sustainably produced (circular inputs based design) protective workwear to be scaled in global dimensions, starting from Asia. This is highly tied to the technological research and development already in process in Asia, never the less that the European operators make strong efforts in circular economy currently. The answer to the research question is: Not yet, since there is no accurate demand currently. Demand can be built if quality and pricing wins the current offer.</p>	
<b>Keywords</b> Protective workwear, Sustainability, Business plan	

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# 1 Introduction

Can a sustainable protective workwear label be a profitable business for a start-up company aiming at targeting Forest industry in Finland? This is the research problem to be answered, in the limitations set by the researcher. The research question is tackled with business planning methods. The outcome of this thesis study will be feasibility analysis over a business concept. The research question is answered in chapter 5. The business idea itself is sourced from selected environmental changes and the megatrends. Thus, the hypothesis of this research is that: 'Selected macro-economic trends allow opportunity for establishing competition in protective workwear business, with sustainability elements included'. This hypothesis is justified in the empirical part, chapter 3.1.

Theoretical framework includes Business planning theories. The Business planning chapter introduces business planning basics, situational analysis and Market research methods introductions. Business planning methods are used in the empirical part business feasibility analysis. Conceptual framework defines first the main driver, Occupational Safety trend, which let research to Protective Workwear. Workwear industry literature is introduced shortly in the conceptual literature chapter. The literature is presented in depth through findings in the empirical part. Forest industry in Finland is presented in the conceptual literature chapter in such depth that a reader is able to follow the justification for choosing it as target customer market later in the Empirical part market screening chapter. Sustainability topic and literature is presented in relation to both of the industries.

Besides the main research question, the empirical part looks answers to below presented sub-questions: What kind of protective workwear business model turns to be feasible & valuable? This are iterated in chapters 4.2, 4.3 and Appendix 2.. How likely is Forest industry a good choice as a target customer segment? Findings are in chapters 2.3.3, 3.3 and 4.3. How much does it cost to produce a specified workwear garment? See chapter 4.2 and Appendix 2. What are the boundary conditions that affect Forest industry in relation to workwear business? Findings are presented in chapters 2.3.1, 2.3.4 and 3.3. What kind of competition exists in workwear? For what kind of workwear product or services is there demand for currently? See Appendix 2 and chapter 5. Theories and methods that the researcher chooses, permit to answer the questions and form the empirical part feasibility analysis.

## 1.1 Object and value of this research

The object of this research is to conduct a feasibility analysis on a business concept, designed by the researcher. (The researcher herself is thus the research commissioner). The beneath lying thinking is to enlighten the workwear supply chain value structure and to identify business models in the protective workwear segment and evaluate the potentiality to enter the market with a new sustainable workwear label. This is discussed in empirical part. Protective workwear is also a burden for nature since it is fabricated of oil. This study findings might also create interest, discussion and thus open opportunities to add circular based competition on protective workwear markets.

## 1.2 Structure of the thesis

This thesis research structure is divided in two: First part is Introduction (Chapter 1) and Theoretical & Conceptual framework (Chapter 2). These chapters introduce the literature used for this research work. Empirical part (Chapters 3, 4 and Appendices 2,3 and 4) reflect the researcher's own thoughts against literature and summarises main findings and iterations in the end of each chapter. These findings and iteration results are thereafter profited in the initial Business plan, which is presented in Appendix 2.


THESIS STRUCTURE	Role of the information	Contents
<b>Theoretical framework:</b>		
Chapter 1	Introduction	Research question, hypothesis, value & etchics
Chapter 2	Theoretical literature: Business planning theories Conceptual literature framework:	Occupational safety Protective workwear Forest industry
<b>Empirical research:</b>		
Chapter 3	Preliminary market screening	Selected trends and boundary conditions
Chapter 4	Business idea feasibility analysis	Preliminary screening, PESTEL, PORTER's five forces and SWOT analyses
Chapter 5	Result, Findings, Discussion and Recommendations	 <b>Business Feasibility</b>

Figure 1. Thesis structure. Mäkynen 2017. The figure 1. visualises the flow of information. The causalities of theories, findings from interviews and the conceptual literature are benefited in the empirical part research work and provide the result for Business Feasibility. The empirical part uses partially zipper-technique. This means that in many chapters findings are summarised in the end of the proper chapters. Result is presented in Chapter 5.

## 2 Theoretical and Conceptual framework literature review

For this thesis research, business planning theories by Barrow, Barringer, Reuvid and Stutely was chosen as main theoretical literature. This thesis empirical part business planning structure follows the business planning process presented by Barringer (2014, 33). The business planning theories and practices are yet profited from each business theory writer. PESTEL model is used in the empirical part in order to identify the situation in the larger economic business environment against the business idea. Porter's five forces and SWOT models are used for the micro-economic level business planning; to facilitate the marketing planning part for the initial business plan (Appendix 2). Through the business concept feasibility analysis, answer is looked for the research question: Can a sustainable protective workwear label be a profitable business for a start-up company aiming at targeting Forest industry in Finland?

The decision to exclude other important business theories from this study presentation, is simply to respect the pages limitations and work amount criteria of Master's thesis study. Some other relevant theories would have been e.g. business modelling, supply chain & cost management, sales & marketing related theories (and sales funnel specific theories of e.g. retail and e-commerce).

### 2.1 Glossary

This glossary presents the acronyms used in this thesis research literature. This section also introduces definitions for concepts used in this research.

Business plan = definitions can be viewed in chapter 2.2.1

Business idea = topic is introduced in chapter 2.2.2

CSR = Corporate Social Responsibility ([en.wikipedia.org](http://en.wikipedia.org))

EU (Commission) = European Union (Commission) ([ec.europa.eu](http://ec.europa.eu))

EU OSHA = European Agency for Safety and Health at Work ([osha.europa.eu](http://osha.europa.eu))

FAO = Food and Agriculture Organisation of the United Nations ([fao.org/home/en/](http://fao.org/home/en/))

GDP = Gross domestic product ([Wikipedia.org](http://Wikipedia.org))

GRI = "Global Reporting Initiative (GRI) is an international initiative for creating a generally accepted model for reporting on economic, social and environmental performance of different organizations." (Siljala 2009, 34)

Hard wear = safety workwear, synonym to Personal Protective equipment

ILO = International labour organisation ([ilo.org](http://ilo.org))

SIC = Standard Industrial Classification of all Economic activities (e.g. [Investopedia.com](http://Investopedia.com))

Megatrends = is presented further by PwC in chapter 3.3. yet the expression 'a megatrend' is defined here below in the end of this section.

OJ L = the Official Journal of Legislation (European Commission web pages)

OSH = Occupational Safety and Health (osha.europa.eu)

PPE = Personal Protective Equipment/ Safety workwear (definition e.g. Technavio.com)

R&D = Research and Development (definition from e.g. OECD.Stat; OECD.org)

Safety wear = PPE in this thesis context, also synonym hard wear in this thesis context.

Sustainable = in this thesis context a synonym to circulation related and nature sparing.

CAGR = Compound annual growth rate (definition from e.g. Investopedia.com)

A **megatrend** is a large, social, economic, political, environmental or technological change that is slow to form. Once in place, megatrends influence a wide range of activities, processes and perceptions, both in government and in society, possibly for decades. These are the underlying forces that drive trends. (*e.g., aging population*). (The US Council of State Governments, 2017-08-22.)

A **trend** is an emerging pattern of change likely to impact state government and require a response. (*e.g., adult children taking care of parents*). Discerning trends and state responses to trends affecting states involves these questions:

- Does the megatrend/trend impact the states?
- Is it significant? Is it broad-based? Is it national or regional in scope?
- Is it short-term or long-term?
- Is it measurable/trackable/observable?
- Is it actionable? Is there an innovative response to address new circumstances? (The US Council of State Governments, 2017-08-22.)

An issue is a controversial, debatable or "hot" topic or an innovative state action. (*e.g., changes to Medicare*). (The US Council of State Governments, 2017-08-22.)

## **2.2 Business planning theories used in this research**

This chapter enlightens in chapter 2.2.1 what a business plan is; its purpose, to who is it targeted to and who is to deliver it. Next is introduced the business plan components and structure. Chapters 2.2.2 to 2.2.4 introduce Market research theory. Market research for



this thesis purposes introduces markets preliminary screening including business opportunity identification, the target market and the targeted customer market scanning and re-searching for preparing a business plan. These business planning basics provide a base for the empirical part.

The business planning depth and amount of the theory, presented here, is limited to these listed above. Thus, this thesis does not present any insight to other business plan related theories due to the decision to keep the thesis research work load in the Master's thesis limits. Never the less, even if excluded from this study, essential in effective business planning is to acquire a coherent understanding especially of supply chain & logistics management, cost management, as well as sales funnel management all the way to marketing theories with their various subjects e.g. retail in general and further specified e.g. e-commerce. Knowledge over these needs to be covered for conducting an accurate financial plan. There by, before conducting the full effective business plan, crafting first understanding of business planning basics is relevant for the initial business idea feasibility testing. Next chapter introduces the initials.

### **2.2.1 Business plan – purpose, components and structure**

As a first thing, to understand Business planning theory, it is useful to look up few definitions of a business plan: Business plan is a written statement. The statement identifies the business goals and means of how it is expected to realise the goals. It shows not only why the planner believes in the business idea but also inspires the possible investors to believe in the businesses growth potential with the business holder's capabilities. It justifies the attainability of the business goals by spelling accurately the business structure, financial resources as well as equipment, talents and premises needed for the business. (Barrow, 2012, 2.)

Another definition is in short that a Business plan should explain "how the business strategy is going to be put into practice through functional strategies". In other words, "what the business intends to achieve and how" (Open learning foundation, 2007, 535).

All business planning methods and tools viewed for this thesis business planning purposes list practically the same components with slightly differing in sequence, structuring and naming of themes. Here are presented few business experts views that cover the theme. Mirroring one another; every approach emphasises the meaning of Executive summary (or Business Concept) in the business plan which is a short, preferably one page summary of components presented below.

A Business plan structure, in short, should cover these five main sections: Concept and background, Market, Product/ Service, Business strategy, Management team and Financial planning (Reuvid 2012, 46-47). The optimal length of a business plan is 20 to 35 or max 50 pages. Shorter is better than longer as investors and stakeholders need to get a solid understanding of the venture or business by glancing through the plan in some ten minutes. This puts the Executive summary in key role. (Barringer 2015, 101; Barrow 2012, 13; Stutely 2012, 16.)

The business plan is targeted to potential investors, bankers, clients, suppliers, advisors and at some extend the employees. Thus, a start-up company planner cannot write the business plan to one self, not even if planning of relying on one's own funding. The business plan should be tailored according to the audience at the time. One can use non-disclosure-agreement (NDA) in order to be able to address the business plan for others to read. The plan is an essential platform to test entering methods, price level and growth potential calculations against the assumed market. (Barrow, 2012, 4-8.) In an enterprise, the chief executive of business or a business unit is responsible of the plan. The most fruitful business planning methodology is to work it out together with all stakeholders that the plan considers, even without minding possible overlapping. The planning phase can involve i.e. employees from all levels or partners that are partially outsiders of a company. (Stutely, 2012, 18.) A start-up-planner could profit this methodology, as well.

In the starting point, one should pay attention to his or her own motives towards start-up entrepreneurship, before starting even the preliminary screening phase of business planning e.g. Reuvid (2007, 7 and 14-16) and Barringer (2015, 32). Both stress one's own motivation; capabilities and timing on starting up a business and for becoming an entrepreneur. These matters influence the business plan. E.g. Barrow (2012, 3) stresses that the coherent plan should show the planners thinking; instead of plan details, the process of how one came to propose a concept. This implies to show comprehensive research and experience that is put in the process in order to be reliable and interesting. Reuvid (2007, 46) seconds Barrow's opinions by suggesting that investors are as strongly interested about the management's credibility for the business than they are about the actual plan. The entrepreneur's capability to capture this should show most importantly in the executive summary, which triggers the interest towards the plan itself (Barringer, 2015, 103).

After deciding one's own motivation and capabilities, the actual process of creating a business plan starts by reasoning the specific business plan's purpose. The active process starts by defining a business opportunity by developing and screening business ideas.

Usually the triggers are one or more of these: changing environmental trends, economic trends, social trends, technological advances, political actions and regulatory changes, unsolved problems or gaps in the market place. (Barringer 2014, 41-47.) The sources of business ideas are dressed also in relation to the preliminary screening, in chapter 2.2.2.

Reuvid (2007, 35) and Barrow (2012, 21) remark that in order to write a successful business plan one needs to carry out a comprehensive market research as an initial for making an actual Business plan. Barringer (2015, 54-56, 121 and 143) seconds, yet, clarifies it further by separating initial market screening to consider the business idea preliminary feasibility, a phase before conducting more coherent markets analysis. This is explained more in detail in Market research chapter 2.2.4.

For getting the business plan on paper, Stutely (2012, 15), proposes a general theme of ten steps to be taken: “1 Begin with certain inevitable preliminaries (contents, contacts, definitions). 2 Provide an executive summary. 3 Set the scene by describing the business. 4 Review the market, your competition and your market positioning. 5 Explain your vision, mission and objectives. 6 Describe your strategy. 7 Explain your plans for developing your products and/or services. 8 Set your financial projections. 9 Highlight the risks and opportunities. 10 Reach a conclusion.”

And practically the same issue, a merely operational emphasising approach for a start-up Business plan is proposed by Barrow (2012, 12). He suggests the following as a logical sequence for a business plan:

1. Marketing: Marketing includes the product information, target market information, competitors analyse, pricing and selling, promotion and distribution methods.
2. Operations: Operations includes all processes specifications. Process can be e.g. manufacture, assembly, purchasing, stock holding, logistics and delivery as well as website.
3. Financial projections: Financial projections include consistent information on sales and cash flow for the next 12 to 18 months. This information needs to show when and for what the finance is needed for. Reuvid (2012, 47) emphasis that this part to further: The financial projections should show profit and loss calculations for three next years. Whereas the Year 1 shows monthly calculations and the next years quarterly calculations. Cash flow calculations should be presented similarly. There should also be proforma balance sheets with opening of year & end forecasts and capital expenditure yearly plans.
4. Premises: Premises equals to all equipment planning, including the space needed. Barringer (2015, 216) gives a lot of weight to business location for operations planning.
5. People: The plan to acquire the talents pool needed.

6. "Administrative matters": The section includes Bookkeeping, insurances systems to be used, it considers client, employer and supplier records modelling as well. Intellectual property rights.
7. Milestone timetable: Equals to project planning starting from setting up the theme ready for production and finally sales.
8. Appendices and Glossary: The section includes batches of Market studies, technical data, patents, competitors analyse leaflets, endorsements and CVs. The glossary will open technical definitions and industry related terms.

The above presented listings enlighten that structure as well as contents will be stressed differently according to the company strategy and purpose of the plan. Open learning foundation (2007, 536) lists examples of business plan purposes which effect the structure: a plan for setting up new business stresses the revenue calculation as it needs to show the return on investment. A plan for new product within a business emphasis the portfolio fitting and manufacturing operations against investment level. A plan for next five-year period emphasis the implementation part.

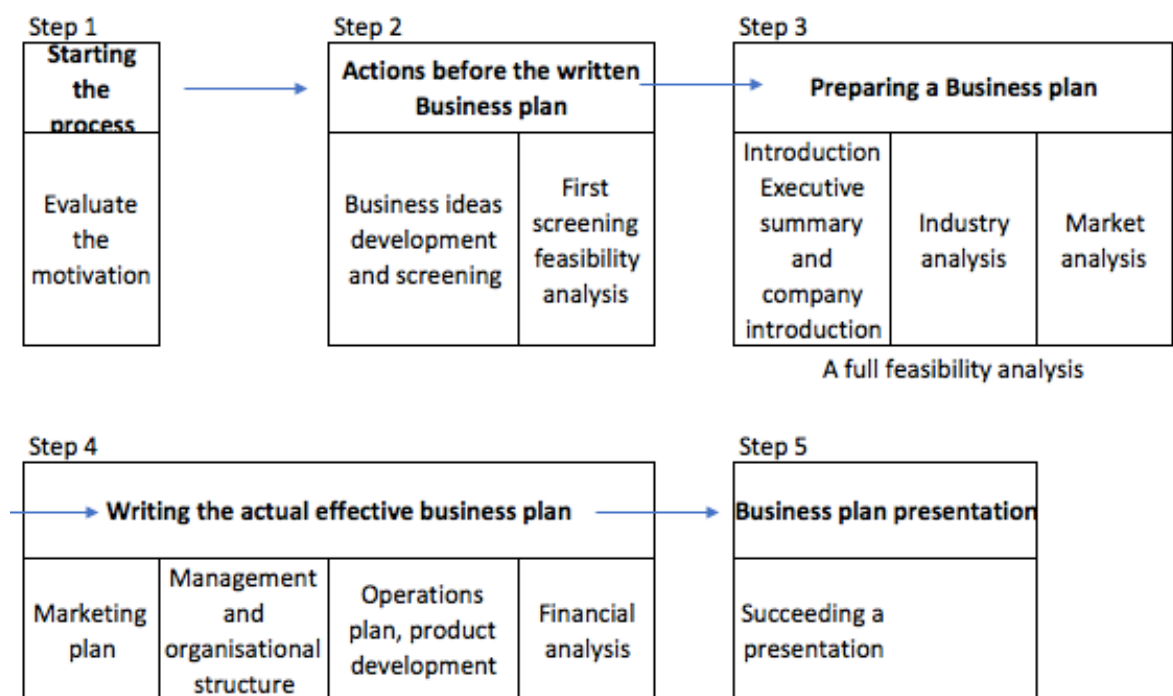


Figure 2. Business planning process. Barringer 2015, modified by Mäkyänen 2017.

This thesis business planning process, in the empirical part, will follow Barringer's process flow (Barringer 2015, 33), which presents five steps to follow, see figure 2. Following Barringer's business process structure, yet leaves space for content variation in each step to

take. Barrow (2012, 11) confirms that there is no “universal” format, though key components are the same in all successful business plans. As mentioned in the previous chapter, the purpose of the business planning stresses different areas and components of business planning according to the planners needs. - In this thesis study case, the empirical part iteration and the actual business plan feasibility analysis output form is addressed to meet Master’s thesis research metrics.

### **2.2.2 Business opportunity sources and preliminary feasibility analysis**

There are three main sources that business ideas are usually generated from. These are Changing environmental trends, Unsolved problems and Gaps in the market place (Barringer 2015, 41). The first one corresponds to PEST model, as Changing environmental trends include: economic trends, social trends, technological advances and political actions & regulative changes. The PEST (or PESTEL) is explained in the next chapter 2.2.3. Noticeable is that the second source for new business ideas, Unsolved problems, forms often a pair with the first business idea source. The third one, filling a gap in market place, refers to product or service gaps, geographical gaps or in relation to Environmental trends; changing a business model (Barringer 2015, 46-47.)

A preliminary feasibility analysis, presented by Barringer (2015, 55-59 and 63-66) includes these topics: Strength of business idea, Industry-related issues, Target market and customer-related Issues, Founder/s related issues, Financial issues. These five topics consist of twenty-five sub-points to consider under each topic. The researcher finds this method to have similarities with other analysis methods such as Porter’s five forces on industry competition and SWOT over a company or business idea. In the empirical part, the feasibility is considered further only through the last two mentioned. Market research topics are introduced in following chapters in the sequence from larger scale to smaller.

### **2.2.3 Situational analysis on different environment levels**

This chapter introduces, out of the three levels of situational analysis that this research empirical part uses, the macro-economic level analysis. The market and micro-level analysis are presented in chapter 2.2.4.

Macro-economic level environment analysis’, PEST model’s, acronyms refers to: Political, Economic, Social and Technological factors. They are analysed in relation to how they affect to markets, industries and enterprises’ businesses. This is the business environment,

which is now a day extended to separate the Legal from Political to its own title and Environment to its own. Thus, it is called either PESTEL or PESTLE. Ethical aspect is separated from Social, when relevant. The model will then be called STEEPLE. PESTLE is favoured in U.K, whereas STEEPLE in USA. (Sloman 2008, 12-13.) It is useful to keep in mind that: “political factors are led by government policy, whereas legal factors must be complied with” (Oxford College of Marketing 2016).

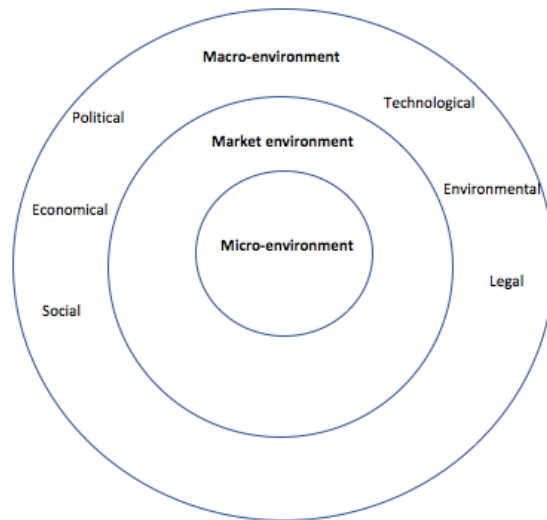


Figure 3. PESTEL model concept by Business Banking Coach 2017.

The figure 3, presents the macro-environment in relation to market and micro-environment level businesses. The ‘Political’ aspect holds in policy making on tax, fiscal and trade issues as well as stability of political situation. The ‘Economic’ holds in interest rates, employment rates, raw material costs and foreign exchange rates. ‘Social’ holds in e.g. identifying emerging trends; understanding attitudes. (Ethical aspect, is part of Social, unless separated to its own, if using STEEPLE). ‘Technological’ holds in e.g. digital, logistics and manufacturing. ‘Environmental’ holds in CSR, climate related issues; recycling, carbon matters, waste and sustainability aspects. ‘Legal’ holds in employment legislation, OSH and trade regulations and restrictions. (Oxford College of Marketing 2016.)

The value of PESTEL analysis for businesses strategic tool is noted by Sloman (2008, 12-13). Oxford College of Marketing (2016) in its blog second this and describe the significance of PESTEL such vital it needs to be the preliminary thing to conduct before entering to any strategy or tactical planning. The latter suggests screening the macro-level environment every half a year, at least, in order to benefit it for the business.

#### **2.2.4 Market research, from screening to feasibility analysis**

Barringer (2015, 33) separates market research process in two phases: The first market screening against a business idea takes place before writing anything on paper and it is conducted fairly quickly. The second market research is to be conducted as part of preparing a business plan, as a full situational industry analysis. Barringer (2015, 56) notes previous research findings showing that scanning the industry attractiveness is extremely important as industry factors effect directly to profitability of companies, varying between 8 to 30 %. The researcher takes it that the maturity of industry is in key role.

The industry analysis refers to studying thoroughly the business one tends to enter. The targeted business segments one tends to enter is researched in the markets analysis (Barringer 2015, 121 and 143). The first market screening against a chosen business idea is to be conducted to reveal if a 'Window of Opportunity', a metaphor presented by Snull, is open for entering the market (Barringer 2015, 55). Yet, in general, market research can be divided to understanding your market as customers and competition in the business one intends to enter. The purpose of these is to ensure that the targeted customers are interested of your offer at the price you are willing to sell it. (Barrow 2012, 21.)

As a natural continue of the preliminary business idea sources analysis, referred in the chapter 2.2.2, having identified the target market, one can move on to Market segmentation. Market segmentation is useful tool for checking if a target customer market is attractive for proceeding to build a business plan against it Barrow (2012, 51). He indicates four rules to enlighten the problem:

1. "Measurability": One must be able to get an understanding on the customers base and size in the segment.
2. "Accessibility": Is one able to reach the target group via the marketing efforts one is ready to make.
3. Solvency: Be sure the segment is able to pay for the product and thus create a profitable business development.
4. "Size": The segment size should provide possibilities for success, yet the bigger it is, it attracts more competition. (Barrow 2012, 51.)

Reuvid (2007, 38-39) suggests that Market research for checking demand for one's business idea can basically be conducted as desk research and field research. Desk research is about getting information of the researched subject via any publically available information source; especially internet. Field research implies to person-to-person interviews

or surveys. Certainly, ready-made professional market researches can be bought, yet the cost of them is not economic for the purpose of business design phase. Depending on the business field, gathering the information through desk research or field research varies greatly. Never the less how the information is gathered, it is important to stay objective while conducting the research and analysing results. As well, in field research, it is recommendable to avoid interviewing people you already know in order to avoid receiving biased answers. (E.g. Reuvid 2007, 39,42.)

Reuvid (2007, 38) proposes ten key questions one needs to answer:

1. What is the value of the market you propose to enter?
2. Is the market growing or shrinking?
3. What and where is the main competition?
4. What are the market shares of your main competitors?
5. Are your competitors profitable?
6. What are your consumers/ customers looking for?
7. Where in the market should you position your product/ service?
8. What is the profile of your average target customer and what market share could you capture?
9. How can you fulfil consumer/ customer demand profitably?
10. How can you promote economically to your target audience?

The researcher considers these questions in the feasibility analysis (Corresponds to “Step 3” in Barringer’s Business planning process structure, see figure 2).

Barrow (2012, 21-22) reminds the usefulness of Porter’s “Five forces theory of industry analysis” tool to be used at feasibility analysis phase. In this research’s empirical part, the Five Forces theory analysis, which includes Supplier power, Threat of new entrants, Threat of substitutes, Industry competition; Rivalry and Buyer power, is used in the market analysis phase. The structure of this theory is presented in the figure 4.





### 2.3.1 Defining Occupational Safety and Health

Occupational safety and health (OSH) are national systems that protect both workers and the environment. Coordinating it, requires a vast range of structures, knowledge and analytics. Generally, Occupational safety and health is defined as “the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment. “(Alli 2008, vii).

According to European Agency for Safety and Health, the cost of accidents at work and occupational diseases ranged in the EU-15 countries from 2.6% to 3.8 % of gross national product, on year 2007. Thus, the achieving return on investment for setting proper OSH at that time was stated to give a result as high as 12:1 (EUR 12 profit for every EUR 1 invested) (EU-OSHA 2007). On EU Commissions’ report about OSH legislation and policy modernisation (10.1.2017) the International Social Security Association, 2013, study showed at least EUR 2 return on EUR 1 invested in OSH (EU Commission 2017a, 2).

Few figures that awakes for taking care of OSH policies in practise:

- “Work-related accidents and injuries cost EU €476 billion a year according to new global estimates”. This is 3,3 % of EU28 GDP. On global scale the cost was EUR 2 680 billion, which is 3.9 % of global GDP. Approximately half of the accidents were fatal (Elsler, Takala & Remes 2017, 2).
- “The costs of accidents are of particular concern to small and medium-sized enterprises because SMEs account for 82% of all occupational injuries and 90% of all fatal accidents” stated by European Commission, year 2004 (Gervais et al. 2009, 11).

Protection of workers against sickness, disease and injury related to the working environment has been in focus through almost a century and seems to be ever more in focus today. International Labour Organisation (ILO), together with the World Health Organisation (WHO) are the institutes that have the mandate to formulate guidance for national systems. The recommendations and codes of practice are addressed to policy makers; governments, legislators, labour inspectors as well responsible in employer’s and worker’s organisations. (Alli 2008, vii-ix.)

Occupational safety and health legislation in EU can be divided to EU directives, EU guidelines, EU standards and National legislation. The European directives set out the minimum standards for occupational safety and health at work places. These directives

are implemented through the national legislation of EU Member States. (EU-OSHA, 2017.) The Directives create a legal framework and thus obligation for the employer to take the measures necessary for the safety and health protection of all workers (European Commission 2017a, 10).

Summarising the benefits of the OSH actions for businesses, according to OSHA Europe (OSHA 2007) are that by conducting the OSH the show social responsibilities also to stakeholders and partners; enhance their brand value, OSH helps in productivity; enhances employees' commitment to the business, reduce costs of accidents and absences of workers, and also encourages the workforce to stay longer in active life. The same listing seems to apply still year 2017, as the benefits has not been promoted to be updated.

EU-OSHA declares that Across Europe, some incentives have been put in place to reward organisations financially for having safe and healthy workplaces. These include: Lower insurance premiums, Tax breaks and State subsidies and grants. These are national actions and thus do not apply in every EU country. (Gervais et al. 2009, 16).

### **2.3.2 Workwear and Protective wear literature review**

Here in this chapter is defined Workwear and protective wear industries to provide a base ground to follow the empirical part analysis. Also in this chapter is expressed the legislation, EU directives, that guide and bind protective workwear market. The market size, maturity, industry trends, strategies, value chain and growth rates situation are expressed in the empirical part, as part of industrial and market analysis, in chapters: 4.2 and 4.3. The literature for gaining the figures for the protective workwear is mainly market reports such as reports from Technavio at Businesswire.com, reports from Ibisworld and GradVision-Research. For gaining insight for the supply chain values and strategies; very enlightening articles from PPE industry expert Turmel and from industry publication Just-Style, Aroq Ltd's analysis are profited for the industry and competition analysis forming as well as the actual output the initial Business plan. Tahvanainen and Pajarinen's literature provides great insight to Finnish textile and apparel market and is used in this work. Previous thesis researches that consider PPE are also used this study for benchmarking.

Here is defined what is workwear: Workwear is used at work for identification and company image reasons, as well as comfort; health and safety reasons. Today some 25 % of adult age population in developed countries uses workwear at work, offered by their employers, who occupy the procurement decision power on workwear. Since the 1990's the

workwear was also thought as corporate wear due to the purpose of companies' image wearing. (Aroq Ltd 2015, 8-9.) Bibs, aprons and tabards were profited for means of protective wear before the industrial revolution. The actual workwear business was started in US by Levi Strauss offering harder wear apparel, the blue jeans, which were more durable than workers own normal clothes for conducting manual tasks. The definitions of soft wear (corporate wear) and hard wear (protective wear) have sprang from the usage purposes. (Aroq Ltd 2015, 9-10.) The latter is officially Personal Protective Equipment (PPE) and commonly also called Safety wear. Interviewee A (13.6.2017) tells that safety wear, among industry, is often still today called 'hard wear'.

In short: "Workwear is defined as apparel bought by enterprises/institutions which given to their employees to perform their work." Workwear outfit is built to provide durability and safety. (Market.biz 2017.)

"Protective workwear is protective or safety apparel that is worn by workers for protection against various thermal, chemical, mechanical, and biological hazards." (Technavio 2017). Thus, the Classification is divided to: Anti-static Workwear, Anti-acid Workwear, Anti-flaming Workwear. (Technavio 2017.) And the applications of Workwear are: Manufacturing industry, Service industry, Mining industry, Agriculture and Forestry industry. There-by the garments are: Chemical protective workwear, Thermal protective workwear, Biological protective workwear, Visibility protective workwear. From these the chemical and thermal are the most growth sectors (Technavio 2017).

Safety Equipment & Supplies operators manufacture e.g. protective equipment for hands, feet, eyes, ears, faces and respiratory systems. The manufacturing sector also includes ergonomic and fall protection equipment, and protective clothing such as hazmat suits and reflective vests. (IbisWorld.com, 2016a.)

Safety Equipment & Supplies Distributors industry operators "distribute and deliver safety equipment and supplies to businesses and consumers". Generally, procurement of the PPE is in bulk as it is mostly b-to-b business. Distributors with retail outlets are included to this sector. Yet, medical and healthcare markets are excluded to its own sector. (IbisWorld.com, 2016b.)

Legislation over Personal Protective equipment for European market is set at the European Commission. Current technologies and processes of bringing PPE to the market has

led to update the 20 years old directive with a new Regulation, (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment, and repeals the Council Directive 89/686/EEC (bsigroup.com 2017; European Commission 2017b.) The new (EU) 2016/425 regulation is applicable as of 21 April 2018. OJ L 81 of 31 March 2016. Legislation base of the Personal protective equipment was originally set in the Directive 89/686/EEC by the European Union Commission and it has applied of 21 December 1989 (on the approximation of the laws of the Member States relating to personal protective equipment), and was published in the Official Journal of Legislation (OJ L) 399 of 30 December 1989. Before 2016, the directive has been modified as follows: Directive 93/68/EEC (CE Marking), Directive 93/95/EEC (OJ L 276 of 9 November 1993) and Directive 96/58/EC (OJ L 236 of 18 September 1996). The directives and regulations set the base for standards. As one example of titles and references of harmonised standards under Directive 89/686/EEC for Personal protective equipment (PPE) is EN ISO 20471:2013; High visibility clothing. This standard for test methods and requirements has been renewed to EN ISO 20471:2013/A1:2016. (European Commission 2017b.)

### **2.3.3 Forest industry literature review**

This chapter introduces the forest sector with metrics that enlighten sufficiently, for this thesis study purpose, the industry as a target group for workwear business, in Finland. The main literature is from Finnish Forest Industries webpages and several publications by Finnish Forest Association, Ministry of Agriculture and Forestry Finland, Food and Agriculture Organization of the United Nations (FAO). Previous research on the industry is available massive amounts. Previous academic research for this thesis purposes is used, especially in relation to CSR and sustainability (Siljala) and for benchmarking the cost of protective workwear provided by employers to employees (Kauhanen). The literature is profited in the market analysis in chapter 4.3. as well as in the Appendix 2 and 3. Here below, the introduction starts with the Forest sector definitions.

The Forest sector means Forestry and the Forest industry both, together. Forest cluster is combination, an ecosystem, of varying industry branches and businesses with interdependences together with Forest sector. These definitions are opened here below.

The Forestry's descriptive designation includes, besides of the main business; planting, caring, managing and logging forests, also extensive services for forest owners. Thus, the Forest products can be divided in to wood products and non-wood products. The latter, vary from forest-related services e.g. expertise services to actual non-wood products such

as berries and mushrooms. The forest's recreational aspects and nature tourism are also included in the category. (Finnish Forest Association 2017a.)

The Forest industry (also called the Wood processing industry, the name referring to wood products manufacturing) is divided into two: The Pulp & Paper industry and the Wood Products industry. The pulp and paper industry is usually called "Chemical" or "Fibres forest industry" and the wood products industry "Mechanical forest industry". In some Central European countries, the printing industry is also included in the forest industry, but not in the Scandinavia, Finland. (Finnish Forest Association 2017b.) Forest industry's major products are industrial roundwood, sawnwood, wood-based panels, pulp and paper (FAO news 2016).

The Chemical forest industry manufactures pulp and mechanical pulp, and further on paper and board (Finnish Forest Association 2017b). Approximately half of Finland's bio-economy is based on products and services of the forest sector. Wide range of new and innovative wood-based bio-products such as fibre packages, biofuels, composites, biopolymers, pharmaceuticals, and cosmetics products are created by joining the traditional forest industry products to other industry's products. (Lier, Korhonen, Tuomainen, Viitanen & Mutanen 2017.)

The Mechanical Forest Industry manufactures sawn timber, plywood and other wood panels as well as their further processing such as windows, building components and furniture. Chips and sawdust are produced as a by-product at the sawmills. Chips are used as raw material for pulp and sawdust in the manufacture of wood panels such as particleboards. In addition to these usage purposes - the chips, sawdust and wood bark are effectively used for energy production. (Finnish Forest Association, 2017b.)

Forest cluster has emerged from the forest sector as other industries and diverse businesses e.g. paper and forest machinery industry and diverse engineering, consulting and expertise services add up to the sector. The forest sector and this entity are commonly called forest cluster. (Finnish Forest Association, 2017c.) In close relation, as part of the cluster, are also partnering logistics activities.

When it comes to main figures and products, Food and Agriculture Organisation of the United Nations (FAO) is the global instance that gather yearly forest product statistics.

FAO's statistics present figures for the production and trade; the quantity and value of forest products cover 55 product categories, 21 product groups, and 245 countries and territories. (FAO 2015.)

In Finland, the forest industry's share of total exports in 2016 was about 22% (Chamber of Commerce 2017; Finnish Forest Industry 2017a). The Chamber of Commerce (2017) states (by using Customs, SITC3 as source) that paper and board (EUR 6.8 billion) was the most significant export product for Finland year 2016 (EUR 6.8 billion). The second is diesel fuels (EUR 3.7 billion) and third stainless steel plates (EUR 2.3 billion). Forest industry is the second biggest employer in manufacturing category in Finland. The biggest is Metal industry. See Table 1. The table shows that Forest industry manufacturing employed on year 2014 some 41 000 persons. Forest industry employed directly 42 000 persons on year 2016 in domestic sites. (Finnish Forest Industry 2017b). According to Lier et al. (2017), the employment was approximately 60 000 persons.

Table 1. Employment in manufacturing 2014. (Finnish Forest industry 2017b).

Employment in Manufacturing Industry	1000 persons	Share, %
Metal industry	137	41,1
Forest industry	41	12,3
Manufacture of electrical and electronic products	39	11,8
Food industry	34	10,2
Chemical industry	33	10,0
Manufacture of other non-metallic mineral products	13	4,0
Textile, clothing and leather industries	10	3,0
Printing	9	2,7
Manufacture of furniture	8	2,3
Other manufacturing	9	2,6
<b>Total</b>	<b>333</b>	

An entire forest cluster is strong in Finland. The manufacturing of paper and forestry machinery as well as diversified sector of engineering, consulting and expert activity has global demand (Finnish Forest Association 2017c).

Forest industry is the only self-supporting and globally succeeding industry sector, for entire Finland. Together, with the food sector, Forest industry is the other of the two industrial sectors which have both primary and industrial production in home country. Differing to food sector, the forest sector does not need continuous financial state aid. A special character for Forest industry is also that the industry is succeeding in the whole country. (Finnish Forest Association 2017c.) E.g. in 2011 two thirds of money gained from forestry stayed in the municipalities, where the wood was collected. In 2011, family forest owners, which represent 80 % of forest owners, across Finland sold wood for € 1.5 billion. The same year state and the forest industries gained approximately € 0,33 billion for selling timber. (Finnish Forest Association 2017c.) The year 2017 the earnings from forestry chopping from private forest is estimated to reach already € 1,9 billion with a 5-7 percent growth (Pöysä 2017, A8).

Investments in Finland show the strength of the industry. In 2015, five forest industry projects were completed in Finland with a total investment value of EUR 537 million and in 2016 three (EUR 198 million). The largest project is the MetsäGroup's Äänekoski biotechnology and softwood pulp mill, which got ready for in 2017, with a cost estimate of 1.2 billion euros. Upon completion, the plant uses coniferous wood 4.5 and birch 2 million cubic meters per year. Its employment impact on the entire production chain is over 2500 jobs, of which some 1500 are new. The most significant employment impacts are on forestry (wood procurement and harvesting) and transport (Kilpeläinen & Lautanen 2016, 9.) "The new Finnish Bioeconomy Strategy aims to increase the bioeconomy output up to EUR 100 billion by 2025 and to create 100 000 new jobs." (Lier et al. 2017). The biggest forest industry companies in Finland are UPM-Kymmene with 9,812 billion euro, Stora Enso with 9,802 billion euro and Metsä Group with 4,658 billion euro turnovers, of which two are ranking in top five in the PwC top 100 highest earnings list (PwC 2016, 6). Solely, for example, UPM employ 19 300 employees of which 38 % in Finland and, by segment for example, in logistics 4000 persons in Finland (UPM 2017; kilpailukyky.upm.fi 2017).

As a summary, it can be noted here that forest industry was presented here above in such depth that it should convince the reader of the industry's size, strength, stability and prominence of future employment figures. All the information above is thus not repeated anymore in empirical part. Findings in relation to workwear business are driven from information above and presented in empirical part. Next chapter presents the sustainability aspect in relation to both workwear and forest industries presented above.



### 2.3.4 Sustainability in relation to targeted markets

This chapter introduces the concept Sustainability in relation to the targeted business market and targeted customer market. Below chapters presents what the literature used for this thesis study informs about corporate social responsibility and sustainability against Forest industry, then after in relation to Clothing industry on general level. Findings from literature are analysed further in the empirical part of the study.

First here is defined Sustainability the way it suits this thesis purpose. Sustainability can in this thesis context be seen as Environmental responsibility for the ecological environment, thus in practice, the aim is to avoid making harm to environment e.g. by using natural resources efficiently (Siljala 2009, 14).

In the context of Businesses role against the five megatrends, which are listed in chapter 3.3, PrivateWaterhouseCoopers company (2017) webpages stated: "As initiatives such as the Sustainable Development Goals achieve greater prominence, there will be a growing expectation on business to engage with this global framework. The purpose of business is increasingly recognised as needing to go far beyond the narrow definition of maximising returns to shareholders. A reframing of the imperative to operate as a responsible business will involve both understanding and measuring a wider set of concerns that reflect broader reflection of companies' impacts on society and the environment." This view is shared within all CSR related literature observed for this study.

Today, biggest Finnish Forest companies report in accordance with GRI guidelines and provide voluntary CSR related information. The Finnish forest industry carry out proactive and opportunity-driven their CSR expectations in the sense that the companies take CSR as an opportunity towards good image and better competitiveness (Siljala 2009, 67-68). In practice, it means taking care of legalities such as ISO 14000 forest certificates to gain licence to operate, minimize risks reflecting to social and environmental issues against financial risk management and thirdly profiting from these as a competitive advantage in the markets (Siljala 2009, 66).

Then turning the attention to Sustainability related to clothing industry and business. In this thesis empirical part business plan context, the concentration is in circular economy outputs profiting. Thus, the literature is delimited according. Thus, first here it can be stated a finding from literature: Circular economy has six principles: 1. Keeping materials in use as long as possible. As an example of a business model in this genre is Lindström

Group, a leading Finnish workwear operator, has managed to create a reverse logistics model. This consists of a looped service model including high technology solutions. Lindström rents workwear to its clients, maintains the clothes, manages the logistics and collects information of the clothes status via RFID chip. 2. Mitigating the amount of waste through-out any products lifecycle. 3. Economic optimizing through-out a products lifecycle. 4. Sustaining the value of a material as good as possible. 5. Environmental responsibility. 6. Minimizing wastage. (Satuli 2017, 25.)

For clothing industry, the trend of ecology, ethics and transparency limit remarkably the sources of supply for ethically active producers. However, the world's largest organic cotton producers (Turkey, India and China), which are also largest producers of traditional cotton, have activated in sustainability development. (Tahvanainen & Pajarinen 2014, 21-22.) Another example of global environmental changes affecting clothing industry is given by the same authors: Development of oil prices and fibre availability affect the raw materials production. Noticeable is that 70 percent of the world's textiles, such as polyester and polyamide, are oil-based. The rise in oil prices and the constraints of areas suitable for cultivating cotton have led to development of alternative fibre sources. As an example, to avoid oil price risk dependency, the production capacity of cellulose-based viscose has been increased. Large quantities of water and pesticides are needed for cotton production. The areas suitable for cotton growing cannot be expanded, scarcity of suitable ones is met. This leads to looking for alternatives. As mentioned, major raw material producer countries have also made contributions to the future in what it comes to alternative fibres. For this reason, experts predict that the big textile supplier countries increase their position. (Tahvanainen & Pajarinen 2014, 21-22.) Technical innovations meaning for the organisation in question, is analysed further in chapter 4.2., 4.3 and Appendix 2 and 5.

The above-mentioned empirical part chapters and appendices enlighten the touch points of this thesis research to the Circular economy. Previous, and very recent (published 2017), research on Circular economy in clothing industry has been conducted e.g. by Weetman in a form of a Circular economy handbook for business and supply chains. The researcher has considered, for business model planning benchmarking, also a recent thesis (2017) input with Workwear Recycling Model for Image wear by Härkönen. Protective wear industry specific articles are strongly used in the empirical Full Feasibility phase. E.g. Aroq Ltd's literature from Apparel industry publication Just-Style and articles written by PPE industry expert Turmel provide most for the business planning.

### **3 Empirical part – Business idea feasibility**

This thesis Empirical part object is a Business idea full feasibility analysis. The structure it follows is borrowed from the Business planning structure presented by Barringer (2015, 33), which was visualised in the figure 2.

Chapter 3.3. introduces first the sources and the preliminary market screening that consider the particular business idea in case. As explained in the theory part, recognizing the sources of the business idea facilitate to identify target markets the business opportunity considers and the matters that support the business idea preliminary. These above-mentioned reflections correspond to Barringer's process chart "What to do Before the Business Plan Is Written", Step 2. These phases were considered in chapter 2.2.4, in the theory part. And it is reminded in figure 1.2.

Chapter 4.2. the opportunity feasibility evaluation is conducted a more thorough Industry analysis considering the business market and a Market analysis, chapter 4.3. considering the target customer market and competition in it. All these actions are suggested to be done before the actual effective business plan is written, as was indicated it in chapter 2.2.4, calling it the "Preparing a Business Plan" phase.

#### **3.1 Methodology and methods for this research**

Here is explained the methodology of the research in detail. The methodology theory is all based on Sanders et al. (2012). The research methods are drafted in the end. The methods are to be multiple, which allows them to evolve while the study evolves. To evaluate methods matching, here is good to state again the research phenomenon: 'Selected trends form boundary conditions that affect the target group Forest industry in such a way that it allows the possibility to establish competition in workwear business successfully and sustainably – true or false?'. This phenomenon and the main research question: What kind of Forest industry workwear business plan turns to be feasible & valuable for my planned "start-up workwear label business" (to be)? The methodology chosen should match methodology used in business planning, since in the end, that is the method choices to be used for this study outcome.

Philosophy chosen:

Pragmatism, because pragmatism asserts that concepts are only relevant where they support action. As the research question is addressed to answer a business plan's profitability, it requires using all possible methods to gain the answer, so it does not leave out

any philosophical view to that the importance is practical consequences of the issue.  
(Saunders et al. 2012, 130.)

Ontology chosen:

Objective and Subjective – both. As the research is studying business decision making in several contexts (the object is a business plan), all matters need to be simplified. Thus, I suggest that the ontology is first, Objective, because the research question is to answer whether a business plan would turn out to be profitable through the knowledge gained from the answers to research questions. To simplify the concept, the researcher chooses to look at the nature of reality so that every business has similar limits for its profitability, free of social constructionism; the costs of products versus sales of products, instead of studying individual's personal preferences. Then, on the other hand, the reality of nature is also Subjective, in order to be able to understand the circumstances in where the study subjects (Workwear and Forest industries markets operate and make business decisions and what forces effect to the decision makers). This for its half can be related to social constructionism. (Saunders et al. 2012, 131-132.)

Epistemology chosen:

Interpretivism and Positivism, as the researchers view regarding what constitutes acceptable knowledge. First, Interpretivism, because (it includes both phenomenology and symbolic interactionism), since the business plan is to be crafted out unique circumstances and business decisions by individuals. The initial screening of business idea and the marketing phase of the business plan requires certainly interpretivism. In other words, the researcher must meet the challenge to understand the world from the subjects' point of view. On the other hand, as important in this research is to take the positivist knowledge field: a business plan requires resources calculations, which are to be considered as dealing with objects and facts rather than individuals feelings. (Saunders et al. 2012, 132, 137.)

Axiology chosen, comes as given:

Biased, because the researcher is the commissioner of the study and is there by in a way participating of what's been researched, as the researcher herself formulates the study subjects and the final object, a business plan (Saunders et al. 2012, 137 -140).

Paradigms chosen:

Interpretive, as a way of examining social phenomenon. So, because the first point is to understand and explain the circumstances; the workwear and forest industries markets,

and only after that follows findings, suggestions and decisions for action. (Saunders et al. 2012, 140, 143).

Approach chosen:

Abduction, because it suits for smaller samples research as well as Inductive approach. There is enough knowledge sources and literature available of the framework considering Forest industry as business in general, occupational safety in general, clothing industry in general, but far little about the subject the researcher is investigating. The workwear business based, especially on circular economy based research related to business planning has not been published much. There is no research at all specifically targeted for the Forest industry about workwear, with in the context of circulating the cloth material. There for the researcher would suggest that logic of Inductive interference could apply as well, since the research could generate untested conclusions and theory about the subject. The researcher finds, that as the beginning point, Abductive approach serves the outcome of the research most safely. Induction fits anyhow to pragmatist philosophy, so it remains to be seen if both approaches apply in the end. Researcher's decision of using the approaches as combination is based on studying Saunders et al. (2012, 143 -146 and 148) suggestions.

Methodologic chosen:

Multiple methods, in more particular, mixed method sequential multiphase design research in order to be able to expand the knowledge collection to maximum as the research progresses. The researcher need to create understanding of the research context and study subject. (Saunders et al. 2012, 160 -165, 167.)

Strategy chosen:

Archive research will be used to gain the coherence of the researched industries – thus, the research will rely a lot on secondary data. Action research could be used for adding up, if it turns out to be useful when formulating the business plan. Embedded single case study research could apply as well, because the thesis outcome, target, is to form a business plan which requires to research several phenomena (megatrends, trends; circulation economy; corporate social responsibility, workwear and forest industries as such, but also as target markets, yet all for the business idea purpose). So, case studying could be used as triangulation, by using multiple resources of data, which allows to gain rich understanding of the context. The main aim yet, is to gain most data from archive research to be able make useful findings and conclusions. If data received by archive research shows to be

sufficient, then case study strategy is not needed nor specified interviews. (Yin, 2014, 61-64; Saunders et al. 2012, 1673, 178 -181.)

Time horizon chosen:

Cross-sectional study, because the research studies a certain phenomenon and the outcome of the study is needed out in few months' time (Saunders et al. 2012, 190).

Techniques and procedures chosen:

Data collection and data analysis techniques and procedures is planned to be conducted as follows: Main data collection methods are literature studies and interviews, which might possibly follow one secondary data gathering survey about the workwear subject. Reasoning for the chosen techniques is that the (case study) business idea is in first hand to be calculation if it is feasible at all/ how it will be profitable and only after that there is need to go deeper to the design of the actual workwear label – which is a part that the researcher decides to leave as a topic for next following researches to be done.

The data for the theoretical part will consist of market reviews, business reports, interviews and theses of the objective topics. Only the issues that cannot not be cleared by reading literature will be gathered through interviews. The literature review continues throughout the work, while new knowledge is gained which might open new need to re-view literature again from extended aspects.

The data analyzing will take place as mirroring literature data against each other, interviews against the literature (and cost and revenue calculations). This way the researcher believes to show if the theory, business idea and reality meet. Also, the researcher is expecting to make findings while interview answers are compared to each other and against the literature theory – this should create discussion around the findings. The findings will be used for the business plan so that they are referred and discussed in both theoretical and empirical sections. The critical steps are to keep the written literature “clean” from the researcher’s possible own bias. Whereas the researcher is trying also to guarantee the interviewed answers to be left non-affected to any bias either. There for the researcher tries to mirror them against the literature as much as possible. This matter also explains the weight the researcher gives to the scene setting part.

The participation of Action research resulted to few iteration and implementation of recommendations rounds. They are presented in the Appendix 5.

### 3.2 Data collection, process flow and interviews

This study was both research oriented thesis but also practise oriented thesis. The researcher used secondary data collection as main method in order to gain knowledge and understanding over the targeted industries. Data collecting was thus basically desktop research. The tactical method of capturing the conceptual framework data for the feasibility analysis was to gather “a handbook” of notes of published literature of the conceptual framework. This researcher’s own notes book was then used as a manual to draw answers and findings from it. Through iteration these were implemented in the empirical part’s business plan. The business plan represents the practical thesis research. Many of the literature notes made by the researcher are presented here in this study, in order for the reader to understand and follow the thesis entity. As was noted in the research design plan, multiple method allowed yet the knowledge base to expand with new information sources during the research.

The conceptual framework data was gathered as follows:

1. Occupational Safety and Health related findings were mainly result of desktop research. One interview was held.
2. Workwear (as part of Textile and apparel) industry was studied as desktop research. Four interviews were held to complement information from literature. Most valuable data around Personal Protective Equipment (PPE) was gathered from recent apparel industry specific publications, e.g. articles from Aroq Ltd, Barrie and Turmel. The size of the industry was anticipated from publicly available market reports. Tahvanainen and Pajarinen’s publication provided the Finnish perspective. Statistics were viewed from e.g. European Union’s data sources.
3. Forest industry data was mainly gathered from Finnish Forest industry website and other acknowledged institutes such as Food and Agriculture Organisation (FAO). Sustainability findings against Forest industry was adapted from Siljala’s 2009 research. Statistics were viewed also from European Union’s data sources.
4. Sustainability in relation to Circular economy findings were gathered from recent printed and internet literature. E.g. Weetman’s (2017) literature helped to locate the proper business concept in relation to circular economy structure. Recent academic research was also profited, e.g. Härkönen (2017) thesis for circular based business model benchmark.

The reasoning for studying the two markets most thoroughly was given in the theoretical part, see chapter 2.2.4. The theoretical part consisted of Business planning theories by Barrow, Barringer, Reuvid and Stutely. The theoretical part was decided to be limited to

Business planning and Market research in order to stay in the limits of Master's thesis requirements. This thesis theory part excluded theories of Business modelling, Supply chain (and Cost) management and Investments theories. One general level finding was gained from noticing that these excluded theories are essential to master in order to make an efficient business plan.

All together five interviews were held out of the seven requests that were presented. The interviewees expertise areas and specifications are listed here below.

Interviewee A: An Apparel Designer in Finland.

Interview took place on phone on the 13<sup>th</sup> June 2017. Duration was 1hour. Notes were taken down. The interview method was theme interview with two topics: 1. General comments on clothing business in Finland. 2. Sparring for the business idea.

Interviewee B: Expert from the Finnish Textile and Fashion organisation.

Interview took place on phone on the 14<sup>th</sup> June 2017. Duration was less than 0,5hour. Notes were taken down. The interview method was theme interview with one topic: 1. Statistics on workwear business in Finland.

Interviewee C: Expert of forest industry sector from the Centre of Occupational Safety.

Interview took place on phone on the 25<sup>th</sup> October 2017. Duration was 0,5hour. Notes were taken down. The interview method was theme interview with topics: 1. Trends in OSH against forest industry. 2. Workwear utilisation and procurement in forest industry. 3. Sparring for the demand for Sustainable workwear label.

Interviewee D: Expert from Textile agency sector.

Interview took place on phone on the 24<sup>th</sup> and 25<sup>th</sup> October 2017. Durations were less than 0,5hour. Notes were taken down. The interview method was theme interview with two topics: 1. Suitability of circulated fibres based fabric for forest industry protective workwear consumption. 2. Availability of suitable circulated fibres based fabric.

Interviewee E: Workwear distributor.

Interview took place on phone on the 2nd November 2017. Durations was 0,5hour. Notes were taken down. The interview method was theme interview with topics: 1. Evaluation of demand for Sustainable Protective Workwear Label in for Forest Industry (Sustainable in this context means that the garments fabric would be produced of circulated fibres). 2. Forest industry operators' current choices among different workwear labels currently. 3. E-commerce in workwear business.

Interviewees F and G: These interviewees would have represented one Central European Textile company and one international 'Sustainable' Workwear label providing company.



The interviews did not arrange eventually. The textile company re-directed further, but interview did not arrange. The apparel company did not answer to the request.

Interviewees names are confidential information and thus placed the Appendix: 4. Interviews.

As a summary of this Data gathering chapter it can be said that most findings were made from literature (from desktop research). Yet, Interviews role was remarkable as the interviewees where the ones who sparred the business idea against real market situation. The process flow included a lot of iteration and few implementation rounds based recommendations driven from both literature and interviews. The project process flow is marked in the Appendix 5.

### **3.3 Business opportunity and preliminary screening results**

This chapter introduces the drivers that led to research the first topic sustainable protective workwear for Forest industry in Finland. This chapter also justifies the reason for this research.

The first trigger that the researcher finds directly providing a business opportunity for protective workwear is solely a Legal enforcement: Occupational Safety and Health (OSH) regulations guarantee continuous demand for protective workwear. As stated earlier in the conceptual literature framework; employers provide accurate protective workwear to employees by law enforcement, yet as well in naturedly to guarantee their safety. Also, the effect of union bargains, pushed through by the labour unions, might cause companies to provide their employees workwear even to the level of excessing the real need (Kauhanen 2011, 39). This scene opens interesting opportunities to protective workwear business.

The business opportunity for a Sustainable Workwear Label for the Forest industry as target customer market is supported by several matters. The development phase of the business idea and concept can be recognised to be driven out of all the three sources for new business ideas noted in Business planning theory. The subject was introduced in chapter 2.2.2, and is to be mirrored here below.

Identifying the potential target customer market comes in this case, through the megatrends, which effect all industries. The megatrends are listed by PricewaterhouseCoopers (PwC) (2017) on the company's website as follows: Rapid urbanisation, Climate change & resource scarcity, Shift in global economic power, Demographic & social change and

Technological breakthroughs. From these five, few megatrends were recognised to probe the base for confirming the business idea and its target customer market:

Rapid urbanisation guarantees the continuously growing demand for wood, several forms of forest industry products, around the globe. PwC (2017) estimates, referring to its report 'Cities of Opportunity' on the company's website, that "We've estimated that we will invest \$78 trillion in global infrastructure over the next 10 years alone to accommodate this growth." The relation of this information to workwear clothing industry is that the Forest industry cluster is and will remain as a large and inexhaustible target group for protective workwear business – since wood is needed in many ways for construction. Literature shows that Finland's efforts follow the European Union Bio economy strategy. Thus, global future demand of Forest products is expected grow so that wood demand in the production of renewable forest energy, biofuels, in new bio-economy products such as clothing, fibre packages, composites, pharmaceuticals, cosmetic and in wood construction is likely to grow – as well as the investments, and thereby the employment. These facts were pointed in the literature review in chapter 2.3.3. If it was questioned: "Why to study the topic Workwear Label targeted to Forest industry?", these above listed drivers give already the justification. Yet, the Sustainable workwear label aspect is explained below.

Population growth, Climate change & Resource scarcity and Technological breakthroughs encourage to study about the Sustainability & Circular economy aspects in clothing industry. Circular economy can be found already from many organisations programmes. Further reading can be find from e.g. from Sitra (2017) webpages. Here is just few examples, for now: A total of 50,000 tons of garments and other textiles are thrown away as garbage annually in Finland (Jurkko, 2015). Fashion industry is claimed to be the second biggest polluter of all industries (Conca 2015). Workwear is comparable, as it is a commodity product, and it is mainly produced of oil based fibres – it is also huge polluter. This was mentioned in the conceptual literature earlier. Polyester fibre takes 200 years to decompose. Around 370 million workwear garments are produced yearly (Aroq Ltd 2010c). The possibility to circulate workwear has been lifted as a hot topic lately. Successful examples in protective workwear sector is the so called reverse logistics, see chapter 2.3.4.

What regards to circular aspect, Technological breakthroughs allow both to recycle textiles and clothing, but also create new fibres that replace several traditional fibres in textile and apparel industry in order to avoid exhausting the natural resources. This was already considered earlier in chapter 2.3.4. Climate change & Resource scarcity and Technological breakthroughs in relation to clothing business are indeed very interesting, vast and

complex topic areas. This thesis does not cover them in depth, instead concentrates on generating business opportunity from these trends. Sustainability and Circular economy in practice scaling is notified as one of the topics to study further, in next research.

For concluding the iteration against literature, the process went through phases of identifying Occupational Safety and Health as a strong trend providing initially business opportunities in workwear; considering protective wear segment. Then it came in question to identify the target customer market in order to concentrate efforts most optimally and, thus in later phase of business planning, model the business concept according. Preliminary market screening for the business opportunity purposes brought the Megatrends to inspection. These underlying global forces, together with market scanning against economic landscape supported to choose Forest Industry as the initial target customer market. The reasoning's is enlightened further in the full feasibility analysis. Sustainability as a strengthening trend also provide opportunity that need the full feasibility analysis.

The attention can thus be turned to the business planning process, that was presented in chapter 2.2.1. The above presented business idea sources correspond to market screening phase. See the Figure 2a, which high-lights this phase.

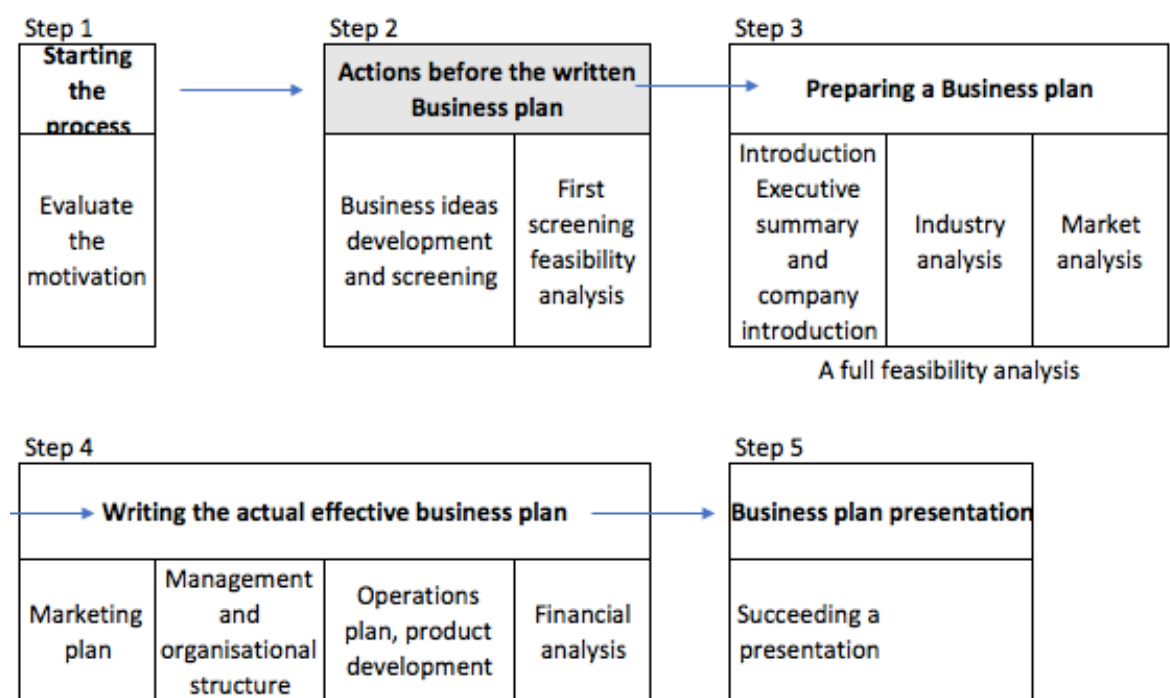


Figure 2a. Business planning process. Barringer 2015, modified by Mäkynen 2017.

As a summary, the preliminary screening proves the hypothesis of this research correct: 'Selected macro-economic trends allow opportunity for establishing competition in (protective) workwear business, with sustainability elements included'. The first screening does not yet answer to the research question, "Can a sustainable workwear label be a profitable business for a start-up company?" Thus, a full feasibility research is in place.

## 4 Sustainable Workwear Label - Full Feasibility Analysis

This part presents the business idea full feasibility analysis implementation. Feasibility analysis is here in below chapters conducted against the proposed business idea. The phase in business planning process structure is “Step 3”. This section provides thus the following elements: Introduction of the business idea concept, an industry analysis and a market analysis considering competition on the targeted market. See Figure 2b.

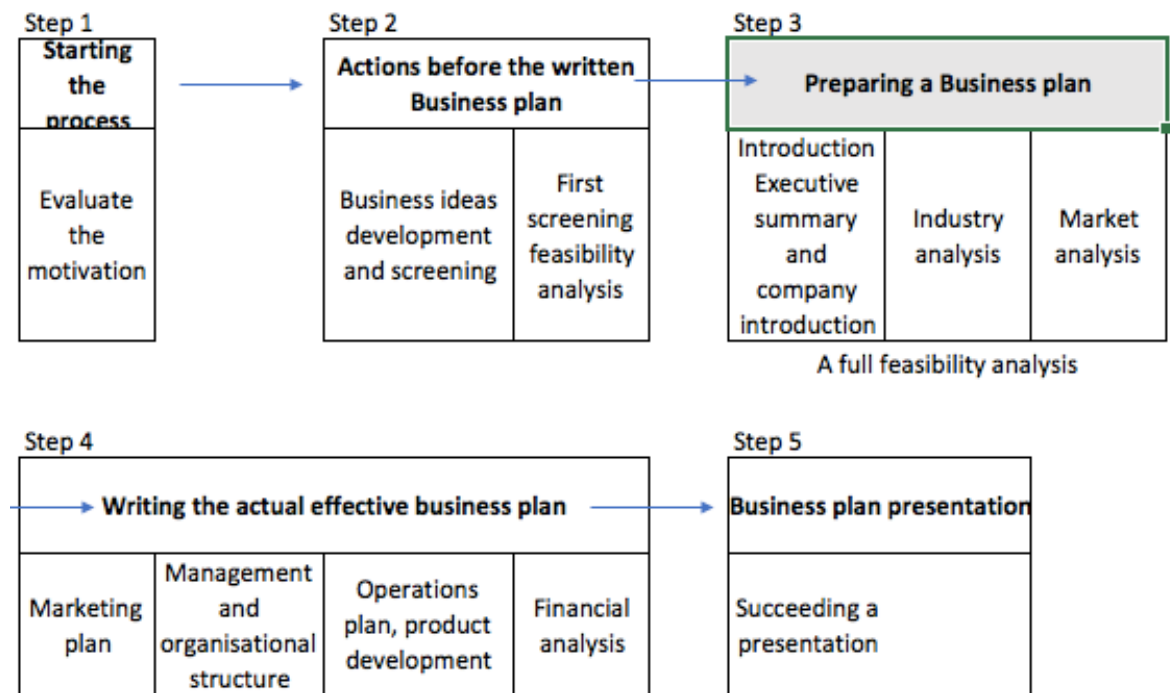


Figure 2b. Business planning process. Barringer 2015, modified by Mäkynen 2017.

The theory for the full feasibility purpose was explained in chapter 2.2.4. The introduction of the business concept is expressed first in chapter 4.1, then after is analysed the business industry to learn its maturity and attractiveness conceptually in chapter 4.2, then in chapter 4.3, for market analysis, the researcher has chosen to use PESTEL model analysis, Porter’s five forces model and SWOT analysis which all give different depth to the research question: Can sustainable workwear label be a profitable business for a start-up company?

### 4.1 The business concept

This chapter presents the business concept introduction in short. The business plan is placed in Appendix 2 as it is confidential. The business plan includes an initial marketing

plan with initial key activities and initial calculations. The plan is targeted for the inspectors of this thesis.

This business solution enhances Forest Industry companies' sustainability efforts. The offer is sustainable protective workwear in competitive price. The price would be -10% of the price of a similar sustainable brand's product range. The product is regulation satisfying high-visibility protective workwear, produced of fabric which fibres are, at least, 90% recycled.

The target customer segment is Finnish Forest Industry cluster with approximately 60 000 workwear user potential. The client base would include a couple of internationally operating forest industry giant companies and SMEs. There are approximately 50 mill sites and 200 sawmills to reach.

The opportunity is open due to regulations bind forest industry companies to provide protective workwear to employees and any partner entering their industrial sites. The industry operators also meet the pressure to continuously add up efforts towards CSR; especially Sustainability.

The competition the new workwear label meets is mainly among traditional protective workwear. Two international operators providing recycled materials based high-visibility protective workwear is identified. Domestic competition does not yet exist.

As summary and notice to the reader, references and proofs to the above stated facts about the targeted customer market can be found from the Conceptual literature chapters as well as from Market analysis chapters. Next chapter deep dives in the workwear industry structure in order to learn about the targeted business to evaluate the concept's feasibility against the industry supply chain structure and strategies.

## **4.2 Industry analysis**

Considering production for the planned to be protective workwear label, it is useful to understand the size of the business in general. To give a base for comparison: "The global personal protective equipment demand was valued at USD 38.38 billion in 2015 and is expected to reach USD 68.69 billion by 2024, growing at a CAGR of 6.7% from 2016 to 2024" (Grand View Research 2016). Another example to give scale: E.g. the third-largest workwear market, Japan & Korea, consumption of workwear is 42 million garments yearly (Aroq Ltd 2010c, 62). Noticeable finding for the research organisation in question is that:

The size of the workwear market in Finland is almost impossible to say based on secondary literature review. Import and export trade figures do not contain the workwear produced by domestic operators, if not produced in homeland. Standard industrial classifications (SIC codes) also merge workwear garments with other poly/cotton retail garments. Consequently, production estimates for workwear have to be based on specific and individual knowledge of the major sources of various workwear garment types. (Aroq 2010c, 58 and Tahvanainen & Pajarinen 2014, 98.) This puts the researcher in the position that interviews need to be conducted, as desktop research does not provide sufficient information in order to evaluate the market's sales volumes for especially protective workwear in Finland. Interviewee B (14.6.2017), confirmed the above stated and thus, instead of Finnish figures, provided statistical information on EU28 countries workwear imports and exports. A notice for the reader; the statistical figures consider workwear in general (which keeps inside also Protective workwear), so the figures are not solely about PPE. For this reason, the information is not in-depth considered here. The statistics, provided by Interviewee B (7.7.2017), yet show that China (valued 3590 million euros) was the main workwear supplier for EU28 countries (both year 2015 and 2016). Another market report shows that: "Europe was the major PPE consumer and accounted for 33.8% of global revenue in 2015" and is forecasted to continue so for now (Grand View Research 2016). Interviewee B (14.6.2017) also notified the researcher that accurate figures imports and exports figures for specific workwear garment in PPE category could be researched from Finnish Customs, but the work amount would be such onerous that the researcher decided not to conduct the task for this Thesis research.

An important finding for the researcher's organisation is that for protective workwear, hazard protection materials and specialty fabrics which bear extreme weather conditions are sourced from Western Europe, USA and Japan. In China, the uniformity of the quality of security and multifunctional textiles is argued not to be sufficient. (Tahvanainen & Pajarinen 2014, 20.) E.g. Finnish domestic manufacturing company, Varpuke Oy, sources their fabrics from Germany, Belgium, Great-Britain and Netherlands (Martikainen, 2016).

A very interesting finding was that Asian manufacturers have started taking stronger positions as their knowledge over demanding fabrics and garments production has already strengthen. Innovations on Circular fabrics are made also in Asia, as Barrie (2017) explains in her article "Breakthrough in recycling fabric blends into new fibres", that Biological recycling uses enzymes to break down fabric and separate it into the component materials. Fibre-to-fibre recycling has been developed together with H&M foundation, HKRITA Hong Kong and Ehime and Shinshu Universities in Japan. This hydrothermal

process is able to fully separate blended fibres back to cotton and polyester. The recycled polyester is able to be used directly, without any loss of quality. The method is also eco-friendly, using only 5 % chemicals, in addition to water and heat. This makes the process also cost effective. The method will form a closed loop of materials. It will have impact to logistics as well. (Barrie 2017.) Weetman (2017, 181) enlightens that in Japan a company called Teijin Fibers has developed such “Eco-Circle” closed loop already in 2002 and is delivering fabric of re-made polyester to some 150 companies, already in global scale. Similar methods are also in use in Europe, e.g. by company called Dutch Awareness, who supplies fabric to workwear operator & clothing brand Tricorp, as an example (Tricorp 2017; Dutch Awareness 2017). Another European example company is Patagonia.

The very key finding for the organisation of this research, comes from putting pieces together of different information sources; the global megatrend Shift in Economic Power (towards Asia), will lead to that the massive scaling to commercial production of innovative fabrics, also the circular based, will be in Asia. The research and development has already taken this giant leap, as was presented in above chapter. The value of this information for this research’s organisation, can be also mirrored through a finding made from another literature: Importantly noticeable is that, in many, perhaps in the majority of cases, the primary and most crucial decision is actually about the choice of fabric in workwear procurement. Understanding who is making the fabric decision provides insight into who is choosing the workwear garments and what criteria they are using to make this decision. By analysing the workwear sector through the channels of distribution, different types of customers can be pictured. Thus, customers that make the decision about garments and fabrics can be: manufacturers, wholesalers/importers, workwear ‘brands’, mail order (catalogue) specialists, contract (managing agent) manufacturers and distributors or garment rental companies; the end user specifiers. (Arog Ltd. 2010a, 44.)

As a summary of this chapter can be listed the key findings in short: Fabric production for protective workwear is strongest currently in Central Europe. Emerging economies strengthen their position in this sector fabric production. It is only matter of time that e.g. Asian operators take the lead. This considers also circular fibres based fabric production.

#### **4.2.1 The value chain structure of Workwear**

This chapter studies distribution channels, value of the supply chain and workwear companies strategies. The value of supply chain assessing keeps inside evaluation on employment costs against profitable business. In relation to this chapter’s information, in Appedix 2, is calculated an example product cost.



Five channels are identified in workwear distribution business: garment rental; wholesale; tender; direct response to a catalogue offer and direct negotiation. The channels of distribution approaches provide the first step to understanding how the workwear buying decision is made. Understanding the channels, also explain the work necessary for sellers to identify and reach buyers. (Arog Ltd 2010a, 44.)

The researcher makes finding against the industry specific literature of the distribution channels: First, the literature does not recognise solely online selling as a distribution channel option as such. Thus, the issue was investigated more and an article by a recognised industry expert was found: About E-commerce as a sales funnel, Turmel (2015b) claims that “mass market E-Commerce B2B providers will drive the price down for both branded and private label products irrespective of the E-Commerce provider the end-user eventually selects”. The mass market e-commerce platforms are such as amazon.com, ebay.com or Alibaba. These have not yet succeeded to build the customer experience to cover the needs of b-to-b varying buyers. The development will come and thus drive down end user prices, claims Turmel. The hardest step for the mass market e-commerce is the customer segment dependant knowledge and service. Thus, still for now, the sales service specialised distributors have advantage. (Turmel 2015b.) Interviewee E (2.11.2017) confirms that in Finnish markets business-to-business customers do not actively use ecommerce as their main procurement channel. The ecommerce is seen as a supporting function for distributors that are physically situated closer to clients. Interviewee E (2.11.2017) notes that ecommerce serves best those b-to-b clients that are situated and operating further from commercial centres. Interviewee C (25.10.2017) notes that the biggest Forest industry operators that have several sites tend to use the renting service model.

These findings information weight for researcher’s organisation is that when planning on producing a new workwear label; the supply chain needs to be carefully thought through in order to retain enough value for the brand, the company, itself. The distributor channels crop some remarkable portion of the profitability, if it is to believe an example that is found in literature by Tahvanainen & Pajarinen (2014, 105), suggesting that retail takes 40% of the price. Two other findings, not surprising though, are that value-added tax is high in Finland and that the supply chain efficiency is the key in any production and sales based activity. E.g. logistics are in key role. See figure 5.



Figure 5. “How Much It Costs to Make a Hoodie” in Asia vs U.S (Lariviere, 2015).

Clothing and textile industry is very labour intensive (Tahvanainen & Pajarinen 2014, 23). The example in above Figure 5, envisions the portion each supply phase values. The finding of this for the organisation in question is, that it sets questions for supply chain planning and business modelling. The figure 5 example is from U.S. but the labour costs effect yet applies to Europe as well. Western European countries such as Italy, France and Germany together with Japan and US labour costs remained the highest in the world (Werner International 2015). Something of the Finnish labour costs tell that, on national scale, there is only one domestic workwear production and sales company, Varpuke Oy, that has its entire apparel production in homeland (Martikainen 2016). The product range and sales funnel of a start-up needs to be considered carefully, in other words, the supply chain effectiveness should be planned carefully when conducting an effective marketing plan.

As a summary in short, finding is that workwear distribution still requires service, yet e-commerce is predicted to overcome eventually. Since the industry is labour intensive the focus should be in supply chain effectiveness.

#### 4.2.2 Workwear sector companies’ strategies

“this industry is not just mature. It is showing the symptoms of advancing age.” (Aroq Ltd 2015b, 58).

Workwear produced by different manufacturers is very similar due to the technical characteristics of protective wear (Tahvanainen & Pajarinen 2014, 106). Aroq Ltd (2015b, 58) speak of “something for everyone” offer strategy. Workwear is influenced, above all, by the various occupational safety regulations criteria. A Protective workwear is a tool that

should last, be comfortable also in challenging working conditions, and protect its wearer from hazards. These requirements are not to be compromised. Quite oppositely than with fashion garments, pricing is the only one left as competitive edge. (Tahvanainen & Pajarinen 2014, 106.) “When technical specifications are dictated at the legislative level and the requirements for product design itself are often defined by customers, it is left to the company's internal development and planning to find the appropriate and most competitive implementation.” (Tahvanainen & Pajarinen 2014, 106).

As mentioned above task of design in workwear business is relatively small if compared to the fashion industry. This is clearly reflected in the share of the value adding generated by the operation. Sales and marketing are clearly more significant elements in the PPE business than design, yet compared to fashion sector, not as important. (Tahvanainen & Pajarinen 2014, 106.) Sales are often based on bidding and long-term customer relationships that do not require similar marketing efforts. Also, workwear is often sold with wholesale prices to b-to-b customers. (Tahvanainen & Pajarinen 2014, 106; Aroq Ltd 2015a, 8.) E.g. the operators retail outlets, while facilitating the local distribution of products to employees of existing customers, serve also the means of promoting sales to new customers. In work clothes the greatest value added comes from manufacturing itself. (Tahvanainen & Pajarinen 2014, 106.) IbisWorld (2016a) portray the PPE manufacturing profitability as “Shining armor” with good profitability expected to continue. A very interesting and useful finding is the underlying added value relationships in workwear company strategies making difference for profitability. The business model choice not only reflects in prices paid for the manufacturing and fabric but also to geo-economic positioning of different sectors. (Aroq Ltd 2010c, 64-66.) The researcher uses this Aroq Ltd's cost calculation model in her business plan. Since 1990's a lot of consolidation has taken place and the workwear market still keeps re-structuring continuously (Aroq 2010b, 81-82). Aroq Ltd (2010a, 56-57) notifies that so called all exclusive in-house operator does not work out as business model any more. Strategies need to be based on specialising to certain markets (e.g. domestic), certain product or design, or certain sector of industry. The strategies can also specialise to adding up by fabric choice or accessories. Also licencing a brand, acquiring manufacturers or building own factories in low-cost countries can also provide strategic advantages. Geffery (2002) has presented an Apparel commodity chain, in which the researcher has marked in the option points for cost evaluation for her planned to be workwear label production chain, the information is considered in the business plan calculations. See Appendix 1. Geffery's supply chain example is for US markets, but suites the purpose as it shows the supply chain with different industry causalities.

As a summary, the key findings from strategy related information, especially from literature above, to the research's organisation, are used for supply chain costs calculation. The design's value added (in this case sustainability's value added) is relative to what the customer is ready to pay for workwear, since it is a commodity product. The finding came up also in theme interviews with Interviewee C (25.10.2017) and Interviewee E (2.11.2017) in the discussions about demand for sustainable protective workwear. From here it is good to move on to the market research side; situational analysis on macro and micro level; positioning and competition in the targeted business and customer markets.

### **4.3 Market analysis**

This chapter presents markets analysis first on macro-level environment (PESTEL model analysis), then on business level (competition) and last on micro-level (company level). All findings are the factors that have impacts to the proper business plan. Main results are summarized in the end of each chapter. Competitor specific analysis and SWOT analysis are presented in Appendix 3 and Appendix 4. The global aspect is presented here, since clothing industry is international. Finland's textile and apparel industry is closely tied to global activities (Tahvanainen & Pajarinen 2014, 19-20; Martikainen 2016).

#### **4.3.1 Macro-environment analysis**

This chapter is about conducting a situational analysis against the respective business idea of "Sustainable Workwear Label" which is to be targeted to Forest industry. The Macro-level situational analysis is conducted by using the PESTEL model, which was introduced in chapter 2.2.3.

Political macro-environment is beneficial for the business idea:

The EU political environment in general is stable, in regard to fiscal and trade policies, never the less of it has seeing threats of protectionism arising in global scale. In political discussion is, thus and in order to succeed in global competition, that EU needs to focus on genuinely European goods, which should be produced and funded at EU level; opening internal market more efficiently also for labour. (EK 2017, 3, 6 and 8.)

The protective workwear business market environment enjoys stable growth expectations which are tied to the success of the sectors client's business growth –and profit from legislative enforcement of OSH. Employee's safety is one of the primary growth factors for the workwear market. OSH grows the market globally. Safety trainings are taking place and several employers are making protective workwear mandatory in certain areas of work.

(e.g. businesswire 2017.) A fresh Industry Vision Landscape statement for 2025, from J R C Science for policy report, suggest fibre-based materials to be a strategic EU industry sector serving clothing, home and technical textiles in wide range (Bontoux, Boucher & Scapolo 2017, 4). The report shows that the opportunity identified by the researcher is being supported.

Considering the target customer market, thereafter, it seems that EU does not have a common policy on forestry. Yet, sustainability is a key factor in the forest sector. The forest sector is strongly influenced, among other things, by EU agriculture, energy and climate, natural resources and trade-related policies. European policy emphasizes, material efficiency and low carbon. The European Union Bio economy strategy seeks sustainable solutions with help of resource-efficient new technologies. (Ministry of Agriculture and Forestry Finland fi 2015, 9.)

Economic macro-environment:

Benefits of producing workwear in Europe is to minimise risks which come along with customs and currencies. Never the less, Finland is far in North and logistics costs are thus high. Also labour costs in Finland are high, so as are in entire Europe compared to Asia, see chapter 4.2.1.

Linked to the earlier stated megatrends, an example of the effect of population growth and urbanisation is that by 2050, 70% of world population, which will be 9 billion by then, and they will live in cities. Also, and thus, by 2050, demand for Finnish forest Roundwood will increase 29% and global industrial Roundwood is predicted to quadruple. (Ministry of Agriculture and Forestry Finland fi 2015, 10, 11; World Bank 2016.) This foresees that forest industry will stay a strong industry; consuming workwear in growing extent. "Global production of all major wood products grew for the sixth consecutive year in 2015" (FAO 2016). Global future demand of Forest products is expected success especially in the new bio-economies sector, which was mentioned on chapter 2.3.3. Listing all these examples, is only to confirm that Forest industry is a solvent and large enough client for protective workwear business – and can be worth for own workwear labelling efforts.

Social macro-environment:

The attitude in the target client segment is risk management driven – the workwear procurement was proven to be price driven and long customer relationships are tied along service models. Yet taking sustainability in picture, the target customer group, Forest industry, do consider and conduct activities of CSR strongly. Sustainability aspects is as

part of risk prevention in the business. By doing so, the businesses benefit from competitive positioning when taking the lead in CSR, this was a finding in literature presented earlier in chapter 2.3.4. This finding's value for the researcher's organisation is that targeted customer is continuously open for further CSR efforts. This encourages to further research around the business concept of this research. The biggest companies seek to be on the Dow Jones Sustainability Index list (Interviewee C 25.10.2017). There are four Finnish technology companies and one forest industry representor; UPM Kymmene (Yle 2016). "UPM has been listed for the fifth time as the best company in the forest and paper industry sector in the Dow Jones European and Global Sustainability Index (DJSI) for 2017-2018" (UPM 2017). The finding via the above listed is that the industry is going through structural changes; paper and pulp is not disappearing, they are shifted to e.g. new soft products – the industrial restructuring will either keep the workwear demand stable or even strengthen it.

#### Technological macro-environment:

Technologies are being developed to enable circulation of textile and apparel, this was discussed in chapter 4.2. Population growth development leads to researching sustainable solutions to create resource-efficiency. New technologies are a focus area also in the above-mentioned Textile and Clothing Vision strategy report. The researcher finds this to speak for the concurring of new more sustainable fabrics in near future.

#### Environmental macro-environment:

Regarding the business idea, key finding is that there is definitely not yet saturated competition with sustainable alternatives in workwear product segment. Finland aims to become the global leader in the circular economy by 2025. A national programme 2016-2017 is set by Sitra (Sitra 2016.) Noticeable finding is that Forest industry is a focus industry in this programme, yet clothing industry is not. Never the less, on EU level heads are turned towards textile and clothing industry, as mentioned above in 'Political environment'.

#### Legal macro-environment:

Direct legal effects for Workwear demand come from OSH policies and regulations tightening's. Currently the industry enjoys stable growth due to tightening Occupational Safety and Health regulations. As mentioned in chapter 4.2, the PPE industry is in stable growth.

As a summary, the result from PESTEL analysis proves that Sustainability trend has remarkable power on Forest industry. The workwear business enjoys from growing awareness of OSH and benefits from the tightening legislation generating protective workwear

demand. Technological advancements support the business idea. The sustainability aspect carrying workwear market is not saturated with competition yet.

#### **4.3.2 Business competition analysis**

This chapter presents findings for evaluating the success possibilities of this research's business idea: Sustainable workwear label for Forest industry. A competitor specific analysis is in Appendix 3. First, the Business competition analysis is good to start with what literature says about Personal Protective Equipment (PPE), of which this research target business is about:

PPE competition is commented by research company Technavio as such:

The market faces intense competition from vendors having both global and regional presence. The competition in the market is based on the distribution channels adopted and the variety of products offered. Vendors also compete based on price, quality, branding, and customer service, and they focus primarily on securing long term contracts with customers due to similar protective products offered by the vendors. Most the vendors offer customized consumer and commercial products and services for various applications while few vendors in the market focus on research and development and continuous innovation, and the provision of support services which provides them added competitive advantage. (Technavio 2017)

The above statement of global competition from Technavio's recent report provides a base for the business level analysis. The competition against this research's business idea of Sustainable workwear label for Forest industry is analysed by using Porters five forces competition model and looks answers for the question, presented in the Introduction section: What kind of protective workwear business model turns to be feasible & valuable? Analysis for "the sustainable workwear label" starts from the core: competitive rivalry, then new market entrants, supplier power, and finally buyer power.

Confidential information is included in the Business analysis and there for is not public. Yet, as a summary, the result from Business analysis: The customer segment currently stresses price. Price and good quality (durability) have to match in workwear as it is commodity product (Interviewees C 25.10.2017 and E 2.11.2017). Stronger differentiation by sustainability is not being asked by customers, except biggest forest industry operators. Some sustainable product would be fine in smaller extend in offer; if the price meets demand and standards (Interviewee E 2.11.2017).

#### **4.3.3 SWOT analysis**

In this chapter is analysed the strengths, weaknesses, opportunities and threats the planned Sustainable Workwear Label might confront. This chapter's iteration is presented in Appendix 4. SWOT analysis Sustainable Workwear Label.

The SWOT analysis includes confidential information and there for is not public.



## 5 Result, discussion and recommendations

This Discussion part presents first the research result. Next is presented key findings and recommendations. These are followed by assessment of quality and reliability of the study. Last is noted the research value for the organisation and student's self-assessment.

The research result is the answer to the research question:

Can a sustainable protective workwear label be a profitable business for a start-up company aiming at targeting Forest industry in Finland? It is answered as follows:

Not yet, since there is no accurate demand currently. Demand can be built if quality and pricing wins the current offer.

The research hypothesis 'Selected macro-economic trends allow opportunity for establishing competition in (protective) workwear business, with sustainability elements included' was proved correct in the chapter 3.3 as a result of Preliminary market screening.

Key finding of this research is macro-level:

The shift in global economic power leads to that in future sustainably produced (circular fibres inputs including) protective workwear will be scaled to global metrics, starting from Asia. This is highly tied to the already successful technological research and development in process in Asia. The researcher anticipates this, never the less that EU tends to set circular economy in core also in textile and apparel sector (See chapters 4.2, and 4.3) in near future. This finding is meaningful for the researcher's plan: the timing of market entrance and the entire supply chain need more research.

Other findings are Market level:

There is a gap in the market to fill. Currently in Finland, there is not an operator or a brand providing protective workwear which is produced of circulated fibre raw materials. Never the less, the supposed Sustainable Protective Workwear Label would meet already at least one international competitor with established supply chain in European markets. Workwear, produced of circulated cotton fibres, also exist in the market already. Few workwear rental service operators provide so called closed loop of protective workwear, which gives more length to each garment life-cycle. Currently this satisfies the target group's CSR standards.

The timing and market entry model are critical factors. Due to this, the business plan needs more research and revising the business concept according. Protective workwear is a commodity product; never the less of product special features such as circular aspect.

Recommendations derived from the findings:

Continue the research in order to re-evaluate supply chain, the timing, entry mode and expansion plan. Continue to follow situational environment while finalising the business plan. Consider including Ethics in next PESTEL analysis.

### **5.1 Assessment of quality, reliability, ethics and validity limits of the study**

The quality of the research design consists of Reliability, construct validity, internal validity and external validity (Saunders et al. 2012, 321 – 326, 383-384). Construct validity measuring should be guaranteed, since the research object is to draft a business plan which requires certain “set of questions” to be asked related to the topic. The internal validity or measurement validity will be guaranteed by doing first a coherent archival research which reveals which questions are left to be asked in order to formulate a business plan.

The theme interviews are so much led by the business plan forming that it leaves little space for unnecessary data to be included in the outcome of the thesis; the business feasibility evaluation.

The extent to which data collection techniques will yield the consisted findings and provide the transparency of how sense was made from the data as well as how similar observations can be made in further studies related to this one has been a guide line. This research main strategy was to craft as much information as possible from already approved secondary data. These were e.g. business reviews, market reports and statistics from respected institutions. Thus, the reliability is guaranteed. The theory for reliability is gained from Saunders et al. (2012, 382, 680).

The research ethics were guaranteed to respect business secrets. Any related data is not published (including interviewees names). As the research was mainly done by archive research, it is easy to justify the good ethics as the data is already public. All references are accurately marked to be able to lead to the information source. Any purchased material was not used and thus any reproduction issues aren't confronted. The role of the researcher as the commissioner of the thesis object; the business plan's concept feasibility did not assess ethical issues as the aim was to learn more about sustainability in protective workwear market and test a related business idea in a form of a business plan.

Validity limiting conditions were met in the following: Due to product classification criteria, it was impossible to gain accurate statistics for the base of the market size and volume of Finland. It would have required the Finnish Customs classifications information & data research of its own. This task was out of the limits of Master Thesis work scope and thus accurate figures for the Finnish Workwear market was not applicable for this study. Another major limitation was met as all of the indented interviewees were not reached. The reliability of this research is not applicable for outsiders of the organisation due to the calculations done are partially based on assumptions. Also, the target business and customer market interview base was very limited.

## **5.2 Value for the organisation and students self-learning aspect**

The value of this research for the organisation in question, the researcher's own planned to be start-up company around a sustainable workwear label, has profited from this research findings. The researcher had little knowledge over the related industries before starting the study. Education gained from studying the two industries with trends and boundary conditions affecting them was conducted thoroughly. The business planning would have benefited if the researcher had already captured stronger logistics, supply chains, investments and finance related knowledge on apparel industry.

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## Appendices

Appendix 1. Apparel commodity chain costs evaluation points (ref. Chapter 4.2.2)

Appendix 2. Executive summary and initial Business Plan – Confidential

Appendix 3. Competitor specific analysis (ref. Chapter 4.3.2) – Confidential

Appendix 4. SWOT analysis (ref. Chapter 4.3.3) – Confidential

Appendix 5. Thesis project report (ref. Chapter 3.1) - Confidential

Appendix 6. Interview specifications (ref. Chapter 3.1) – Confidential

Appendix 1. Apparel commodity chain costs evaluation points (ref. Chapter 4.2.2)

