



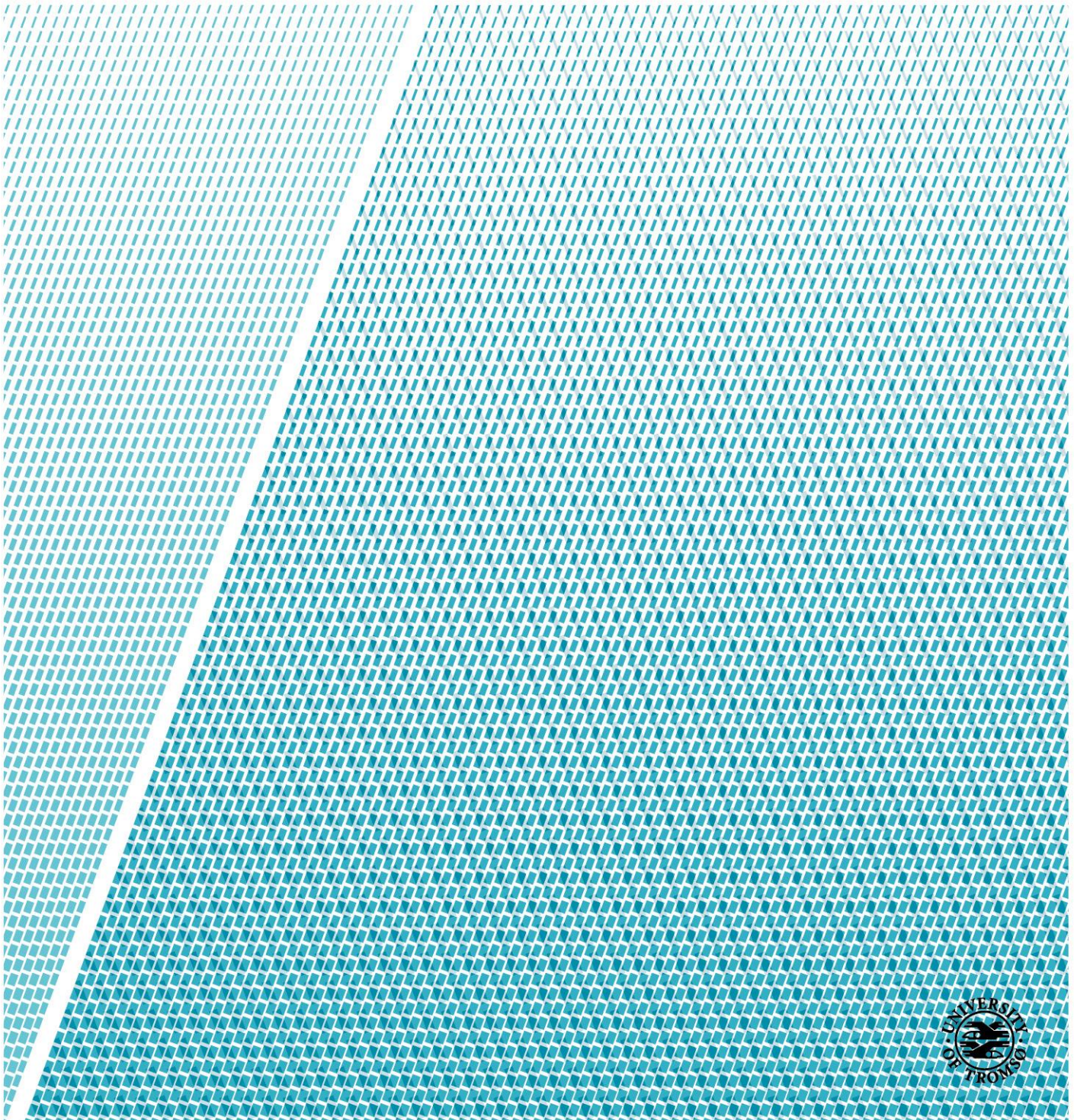
School of Business and Economics

Developing a Viable Commercialization Strategy for a Research- Based Idea

The Case Study of Literate AS in Academic Entrepreneurship

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Abstract

Norway has experienced a marked increase in the number of students who drop out of high school due to failure to cope with learning disabilities and the sub-sequent over-dependence on the social services system since 2008. Disability claims have become the third largest expenditure for the Norwegian Labour and Welfare service (NAV). In order to solve this problem, Trude Nilssen Nergård a professor in Experimental and Cognitive Psychology has created a testing and diagnosing test kit for learning disabilities and dyslexia. The tool kit which will significantly contribute to reducing the numbers of high school drop outs and reintegrating people back into the work place is a digital test kit that tests individuals for reading comprehension deficit and dyslexia. This test kit has been presented to the UiT and will be used as a case study for commercializing a university based invention.

The main purpose of this thesis is to develop a viable commercialization strategy for the Literate AS tool kit. The process is guided by the main research question; *“How to commercialize a research-based technology in testing learning disabilities and dyslexia in Norway?”*. The process consists of four parts; introduction, innovation study, market study and business plan. Each part is significant in developing the commercialization strategy and have their own sub research questions. The introduction is the umbrella to the whole thesis. The main sub-research questions are presented and a discussion on the role of academic entrepreneurship is provided. The innovation study deals with unbundling the innovativeness of the technology and capturing the commercial potential of the innovation. A concise description of the technology is presented and a modified innovation map highlighting the functions, design and structural controls that constitutes the end user utilities and value proposition of the technology. The market study is informed by the findings of the innovation study and information from the semi-structured interviews, discussions and secondary data is used to develop a market strategy. The business plan is then presented as the embodiment of the whole research process. The business plan has been developed as a stand-alone document that can be presented to investors and presents the commercialisation strategy for Literate AS.

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List of Abbreviations

| | | |
|----------------|---|--|
| NAV | - | Norwegian Labour and Welfare Services |
| UNESCO | - | United Nations Educational, Scientific, Cultural Organisations |
| PESTEL | - | Political, Economic, Social, Technological, Environmental, Legal |
| SWOT | - | Strengths, Weaknesses, Opportunities, Threats |
| PPT | - | Pedagogisk, Psykologisk Tjenester/ Educational Psychological Services |
| RNNK | - | Rehabiliteringssenteret Nord-Norges Kurbad |
| UiT | - | Universitet i Tromsø/ University of Tromsø |
| NDA s | - | Non-Disclosure Agreements |
| CEO | - | Chief Executive Officer |
| WHO | | World Health Organisation |
| UN | - | United Nations |
| R&D | - | Research and Development |
| IPR | - | Intellectual Property Rights |
| STAS | - | Stabstrening |
| UDIR | - | Department of Education |
| BUP | - | Barne og Ungdoms Poliklinik |
| UK | - | United Kingdom |
| ARK | - | Arbeidsrådgivningskontoret |
| ICT | - | Information Communication Technology |

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1 Introduction

As economies progress from natural resources driven, primarily agricultural, to technological ones, it has become increasingly important for countries to reach and remain at the state of the technological art through their universities research and also translate their technological findings into industrial development (Shane 2004). Foss & Gibson (2015) confirms this observation and posit that governments have been actively engaged in ensuring that universities are motivated and encouraged to integrate research and development (second mission), knowledge transfer through education (which is core mission) to application through commercialisation of their ideas (so-called third mission). The transition from the core teaching mission of universities to the third mission of commercialising their inventions is a cycle that feeds into each other. It starts with government support for basic research in universities, moving to identification on inventions arising from the researches to be protected by intellectual property. After protecting the inventions with applicable intellectual property rights the invention is then taken to the market. This part can be led by the idea inventor or can be licenced to a lead entrepreneur from the industry. The transition from academic to translating the inventions to a commercial commodity has however faced the challenge of implementing a successful commercialization strategy that provides a stream of economic returns to the idea developers.

Using a case of learning disabilities and dyslexia testing and diagnosing tool kit, Literate AS, this thesis explores the process of commercializing a university based innovation. The thesis will evaluate the business idea of Literate AS and its market potential for the Norwegian market. Findings will be used to construct a viable commercialization strategy for the tool kit. This chapter will present and discuss the importance of this study, the main research question, methodology and some limitations encountered during the collaboration between academic and industry.

1.1 The Importance of the Study

Statistics from the Norwegian Labour and Welfare Service (NAV) and studies on the status of the Norwegian education system have shown that since 2008 there has been an increase in the number of high school drop outs and subsequent dependence on the NAV social services support. In August 2016, the Prime Minister highlighted that many young people were

dropping out of high school and there was need for diagnosis for learning disabilities and a good support learning environment to compliment and improve on systems already in place. According to NAV, 3 out of 10 people do not complete upper secondary school with projections showing that the surplus of labour without upper secondary qualifications could number almost 150,000 individuals by 2030¹. Statistics indicate a symbiotic relationship between the increase in the numbers of high school drop outs and an increase on dependence on the social services support because the risk of unemployment is higher among people with low education levels. On a wider scale, the increase in high school drop outs also leads to a drop in skilled workers, thereby depleting the national human capital resource base. Statistics also show that a significant number of claims are from people with disabilities, learning disabilities like dyslexia and autism included.

Testing and screening individuals with disabilities is important for NAV and other stakeholders in the education and employment sector. This allows these institutions an opportunity to evaluate each individuals' challenges and recommend remedial solutions that will make them perform better at their tasks in school and work place. People with learning disabilities encounter practical problems because they are unable to cope with the demands made by their environment and are in most cases excluded from important facets and roles of social life. According to the Rasmussen, Mahle & Sagmo (2006) study students with learning disabilities viewed the school as a marginalizing versus an integrating institution. This is not to say the school is not helping students with learning disabilities. Rather, it is an indication that there is need for more user focused solutions. Data collected during the market study confirm that the market requires a comprehensive, and efficient tool that will compliment initiatives for social integration and rehabilitation for people with learning disabilities. The ideal product should be able to provide results that clearly show the individual's underlying causes for their poor performance in school or at work so that user customised remedial solutions are provided. Once valid and reliable measurements are provided, these individuals will be empowered to actively contribute to the growth of the economy and are weaned off the social services support.

¹ NAV Horizon Scan 2014

The technology developed by Literate AS is important to solving this problem. The Literate AS invention is a digital tool kit that tests for reading and comprehension deficit and dyslexia. The test has shown over 90% sensitivity and 73% specificity in discriminatory power. The test which targets individuals in the 16-65years age group can be used in schools and in the work place and is therefore the ideal solution to the problem.

1.2 Trends that Led to the Tool Kit

Since the signing of the UNESCO Salamanca Statement on Special Needs Education (1994) schools and institutions that work with issues of special needs and learning disabilities have sought a new paradigm in addressing these issues. Policy initiatives have moved from segmenting individuals with learning disabilities into pockets of people with special needs to policies and procedures that empower and enable these individuals to realise their full potential in the work place and in school. These procedures included how individuals with learning disabilities were screened and tested and how remedial solutions were offered and assessed. Norway is a signatory of the Salamanca Protocol (1994) and has actively transformed the screening and testing of learning disabilities in schools and in the work place.

However, beginning around 2008, there has been a marked increase on the number of high school students who drop out of school due to frustrations and challenges linked to failing to cope with learning disabilities. A number of these individuals have also been linked to violent crimes, suicides and over-dependence on the social services system. This development has led the Norwegian government into seeking more comprehensive and individual oriented ways of testing and diagnosing people with learning disabilities. Studies in this regard have established that the tools currently available on the Norwegian market provided basic screening and testing, yet the market could do with a more comprehensive, technologically compliant and efficient test kit. To this end, the Literate AS learning disabilities and dyslexia testing tool kit was developed. This thesis will analyse how its unique characteristics will contribute to addressing the challenge in the market

1.3 Research Question

This thesis' main objective is to identify and develop a market entry strategy for a research based technological innovation. It is therefore critical to understand the central drivers of start-up commercialization strategies and the industry the product is entering.

Commercialization drivers focus on processes, strategy and resource mobilization. Effective commercialization differs across industrial sectors but they all consider the role of markets for ideas, the type and appropriability of an innovation, the novel or unique value of an idea and how they can be framed in order for them to realise economic returns for their founders (Gans & Stern 2003). This understanding provided a yardstick for developing the main research question for this study. According to Bryman (2008) a research question should primarily consider defining the main research problem, specifically, to understand what it is about the study area that the researcher wants to know about. The knowledge should guide the researcher to draw up clear, specific, not broad and open ended questions based on the “what”, “how” and “why” questions. In the case of this thesis' case study the research question therefore is;

“How to commercialize a research based technology in testing and diagnosing Learning disabilities and dyslexia in Norway?”

This research question will provide a basis for this research in terms of evaluating the business idea in relation to the business environment and the challenges, limitations and opportunities for success. Sub research questions for the innovation study and market study will be discussed below. The Business Plan constitutes the last chapter and encapsulates the new knowledge gathered in the research study and presents a clear strategy and response to the main research question

1.4 Innovation Study

Efforts to bridge the gap between the academic society and industry by encouraging commercialization of inventions confirm that innovations are critical in sustaining businesses in the 21st Century and beyond. Innovation is defined as an iterative process initiated by the perception of a new market and / or new service opportunity for a technology based invention which leads to development, production and marketing tasks striving for the commercial success of the invention (Garcia & Calantone, 2002). This iterative process starts with a

theoretical conception which is developed into a technical invention. The invention is then evaluated as a commodity that is taken to industry for commercial exploitation. Key to evaluating an invention for commercial value are its intellectual property claims, value proposition and uniqueness to competition on the market. Commercial exploitation is what separates an invention from an innovation.

An idea remains an invention unless it has been commercialized. The commercialization is a process of turning ideas or inventions (patented or not) into reality and capturing value from them. The whole innovation process has been described by Schumpeter as a process of “creative destruction” where there is constant search to create something new which simultaneously destroys the old rules and establishes new ones- all driven by the search for new sources of profits (Tidd & Bessant 2009). This submission by Schumpeter suggests that there are different types of innovations that affect the market in different ways depending on their level of innovativeness. Therefore, for innovations to realise their full market value, it is important to understand the type of innovation with a special focus on the commercialization drivers.

Economic, political, social, environmental and technological advancements are pointing to the need for innovations that are sustainable, efficient, user and environmental friendly sources of profits. These advancements imply the need to creatively destroy old systems and inventing new systems. It is also a process of influencing societal beliefs and expectations by having clearly spelt out value propositions that will be attractive enough to convince people to buy into them. This iterative process of destruction and creation is not linear, it is a process that feeds on a combination of intellectual and physical exhaustion driven by a passion for success in both new and existing markets. The objective of the innovation study chapter is to answer the research question;

“What is the end user value proposition and innovation position of the Literate AS tool kit for testing and diagnosing learning disabilities and dyslexia?”

The innovation study is therefore, divided into three sections which are connected and designed to provide answers to the research question above. The first sub research question to be investigated is;

“What is the value proposition of the Literate AS’ invention?”

Petrusson's (2004) innovation map is instrumental in answering this question. The innovation map is ideal for visualizing the technology's intellectual claims, evaluating the strengths of the product's structural controls in protecting these claims as well as describe the user utilities embedded in the innovation. The innovation map allows me to deconstruct the innovation's intellectual claims and use them to design the business model for the commercialization process. It forms the idea evaluation framework for this study.

The idea evaluation analyses the technical functions of the invention. The technical functions which are identified as the six specific areas of reading and comprehension skills used to determine eligibility for learning disabilities constitute the battery pack of the invention. The merits of the technical functions will be evaluated against the product design and how they can efficiently address the pain on the market. User compatibility, packaging and distribution will be analysed in terms of how they add value to the customer. Functionality, product's uniqueness and design are relevant in establishing the level of competition on the market. Some innovations are nice to have and do not save or address a need on the market. Some like the Literate AS are developed in order to address a market need. However, speculating on a market need and practically addressing it are two different processes. This idea evaluation process has the objective of unbundling the innovation and presenting the unique attributes that would make it the preferred product on the market.

The second sub research question focuses on the competitive landscape by answering the question;

“What is the market potential of the innovation?”

This sub research question is important in understanding the commercialization market environment. In a commercialization environment established firms can both control a new innovation's market entry by imitating the innovations, capitalize on their brand on the market and discredit a new product or by simply introducing a new improved version of their known products on the market. More aggressive competitors would even want to maintain market niche and would buy out competition or competing products and make them part of their product portfolio. The competitor analysis is vital in highlighting characteristics of the Literate AS tool kit that makes it stand out in the market. This process looks at the product's technical functions and design, measured against the acceptable global standards in testing

and diagnosing for learning disabilities. These parameters are relevant for the business strategy as they are important in determining the point of market entry, pricing structure, distribution and services channels as well as areas that require extensive investment at product launch. They also influence the structural controls to consider in order to protect the product's methodology against piracy. This section concludes by proposing a value proposition for the Literate AS innovation. The value proposition is a sum up of the intellectual claims and customer needs in terms of functionality, design and product's uniqueness over competing products on the market.

The second part of the innovation study evaluates Literates AS tool kit's innovation level and market impact. The section's objective is to answer the sub-research question;

What is the product's innovation level and market impact?"

The analysis is linked to the first section of the innovation and together allows me to present a balanced review of the technology's innovation typology. This information lays the foundation for the market study. Understanding the product's innovativeness and its unique value to the end user is useful for identifying the target customer, evaluating the market's potential and formulating a market entry strategy. It basically determines the commercialization framework. The analysis provides knowledge on whether the innovation is radical or incremental depending on the product's novelty. Assessing the product's market impact will provide an insight on the challenges and opportunities on the market and how the product's competitive advantage can be leveraged.

1.5 Market Study

An idea or invention may be brilliant on paper but would fail to make a success on the market due to lack of knowledge on the most appropriate market for the innovation. Although innovations are about creating more efficient processes and services which implement changes to existing methods or techniques (Crumpton, 2012), understanding the market needs these innovations are created for is important. Some innovations lose momentum before they get to the market because today's economies are more knowledge based and move at a high speed. Gans & Stern (2003) are of the view that the main problem with most innovations are not so much about the innovation itself but the commercialization process. Start-ups need

knowledge on the commercialization environment for them to be able to know the exact market segment that is profitable. Market knowledge is important in commodifying technologies. There are different types of innovations and they also require different approaches of implementation and commercialisation (Kassicieh et.al., 2002). The market's potential should be investigated properly, particularly in highly competitive industries like that of testing and diagnosing learning disabilities. It is impossible to develop a successful business strategy without establishing the general direction of the company.

As such, the market study seeks;

“To evaluate Literate AS product’s market opportunity and formulate a market strategy that compliments the product’s sustainable competitive advantage.”

The commercialization of research based innovations follows two dimensions, i.e. the product market approach and the market for ideas approach (Gans & Stern 2003). The approach decided upon influences the business strategy to be adopted. For the market study objective to be fulfilled I will establish the need in the market and the strategy will provide the answer on how to solve that need. Pinson (2008) emphasizes that any successful business should have a highly targeted market that can be effectively served by the proposed business i.e. there should be customers who need what is being offered and would choose this offer over competitors on the market. For a start-up like Literate AS, such a target customer should be strategically positioned to link the company to other key stakeholder in the market thereby leveraging its competitive advantage. So the study seeks to establish;

“What is the unmet need for the testing and diagnosis of learning disabilities and dyslexia in Norway?”

The study also seeks to establish what motivates the customers and who the main stakeholders in the industry are. A market analysis to evaluate the internal and external commercialization environment will be carried out.

2.5.1 Market Analysis

The objective of the market analysis is to analyse available information and use it to take appropriate decisions regarding the marketing of the product. The information I will gather in

this study will influence the decision on target market, market segmentation and the market entry strategy. Literate AS intends to launch its product in Norway and later in Sub-Saharan Africa, however, this market study will focus on the Norwegian market. Activities at market entry, the company will focus on Northern Norway with product launch starting in Tromsø expanding into Nordland and Finnmark. Literate AS follows an organic growth strategy and uses its networks to build a customer base with long term renewable contracts. “Organic growth strategy involves strengthening your company using its own energy and resources” (Mack 2016). Literate AS’ market growth is driven by innovation, new product development and market development particularly for the African market. Based on market responses during the market segmentation process, the market potential is estimated including product launch capital requirement. These decisions will be based on the results of the customer analysis and competitor analysis.

1.5.2 Competitor Analysis

Competition in the global market in the 21st Century has now become tougher and complicated, particularly with activities of the online competitors (Eboreine & Adedoyin 2013). This observation resonates with Literate AS’ competitive landscape. In any industry, no competition is small competition but well-researched marketing strategies have the potential of making some competition irrelevant. Identifying and understanding a product’s competitive advantages and its limitations is important in building a competitive brand and establishing a market niche.

With this in mind, two approaches were taken in the competitive analysis i.e. analysis of competing products and an analysis of competing companies. This is important for the study because the industry for screening and testing for learning disabilities is moving at a fast pace. This means well established companies with a stable capital and human resource base can also develop or improve their older versions at an alarming rate. The competitor analysis will evaluate the internal and external threats for Literate AS by conducting a PESTEL analysis, Porter’s Five Forces analysis and a SWOT analysis. I have decided to apply both the PESTEL and the Porter’s Five Forces so as to get different perspectives of the threats and opportunities in the market.

1.5.3 PESTEL Analysis

A PESTEL analysis is a framework for analysing and monitoring the macro-environmental factors that have an impact on an organisation by looking at political, economic, sociological, technological, environmental and legal prompts. According to Murray-Webster (2010) this technique facilitates a wide scan of the context and actual or potential factors that would affect an organisation's objectives if left unmanaged. In the context of Literate AS the PESTEL analysis provided a roadmap for understanding the industry in the SWOT analysis. Literate AS' potential customers are public sector government agencies, therefore, the PESTEL analysis focuses on the government policy on learning disabilities and the international market in terms of political stability. Economic factors considered are linked to profitability. Literate AS depended on grants and subsidies for the start-up capital requirements and intends to build its revenue base from sales. As such the economic growth rates, inflation and buying power for the buyers will be analysed including regulations in tender processes. Social, technological, environmental and legal factors will be used to plan for product launch, analyse IPR and other industrial regulations to be fulfilled as well as plan on keeping the product technologically compliant. Literate AS's mission is to "*Unlock everyone's potential*" through continuous development and provision of services related to the screening, testing and diagnosis of learning disabilities, dyslexia and associated activities in the work place and in school. Understanding the macro-business environment is critical for decisions on the launch of subsequent products that are being developed.

1.5.4 Porter's Five Forces

The study will also evaluate Literate AS' potential using the Porter's Five Forces model. This model is recommended as a strategic tool for segmentation as it provides a guideline to assess a segment's growth rate, accessible segment size and profit potential (McDonald & Dunbar 2004). The market for Literate AS is very competitive and failure to design a sustainable commercialization strategy will see the company becoming a statistic of failed start-ups. The Porter's Five Forces compliments the PESTEL analysis and enables me to create a list of potential issues within the macro-environment. "Whilst understanding the macro-environment is essential for developing your strategy, it only give you half of the picture. You also need to have a thorough understanding of your competitors and the impact they can have on your organisation" (F.M.E 2013). This analysis allows me to take into account the competitors'

activities including their major customers, get an insight into the rivalry within the industry as well as evaluate the threat of substitute products.

1.5.5 SWOT Analysis

The core objective of the SWOT analysis as a strategic planning tool is to evaluate the strengths, weaknesses, opportunities and threats to a project. As Haughey (2014) submits, a SWOT analysis involves specifying the objective of the project and identifying the internal and external factors that are favourable and unfavourable to achieving that objective. The strengths and weaknesses usual arise from within the organization while the opportunities and threats are external. Therefore, it is important for me to establish the opportunities and strengths, the weaknesses and threats and how their connected. This finding is crucial in determining the market potential for Literate AS. Houghey (2014) further highlights that the limitations of a SWOT analysis among others is that they may persuade organisations to merely compile lists rather than focus on thinking about what is essential to achieve the goals. These lists are sometimes presented uncritically and without a clear prioritization. These limitations of the model will be taken into consideration during the analysis.

1.6 Business Plan

A business plan is a blue print for a business that provides the tools to analyse the business and implement changes for making the business profitable and one of the principles for business failure is the lack of an adequate business plan (Pinson 2008). It serves as the strongest selling tool to investors because it states and communicates the organisation's vision and mission on addressing the identified customer needs. This blue print document has two key benefits i.e. it serves as a guide for the business and as a document for financing. Literate AS intends to expand into the Sub-Saharan African market from 2018, the business plan is also essential in evaluating the organisation's potential in this market. Understanding a business idea is central to developing realistic market projections as well as to creating a strong marketing plan. There is a core-relationship between a business idea and the market and a business plan defines the target market, solidifies an organisation's competitive advantage and focuses the business on the key elements for success (Bennet 2005). These key elements include customer's unmet needs and motivations for buying the proposed solution,

market condition and regulations, limitations, possible pitfalls and contingency plans that will make the business survive in the market. Although a business plan cannot be accurate to the dot, it should be representative enough to prepare the business for the market. It should clearly communicate the added value that makes the customer comfortable.

In this master thesis the business plan will be developed as a stand-alone document that embodies the innovation analysis and market analysis and can be presented as a separate document from the thesis. It is the answer to the thesis' main research question;

“How to commercialize a research-based technology for testing and diagnosing for learning disabilities and dyslexia?”

1.7 Methodology and Data Collection

Methodology refers to the way with which we approach problems and seek answers based on our assumptions, our interests and objectives (Taylor et.al 2015). When conducting research for business or academic purposes questions asked must be valid and fair, relating directly to our need for the sought information. This means a research should have a clear objective purpose expressed in a fair and systematic way. By the same token, data collected should be equally analysed in a rigorous, careful and systematic way so that the research results are valid and informative (Bryman 2010). Key to the process is an understanding of reliability and validity of information gathered, as well as credibility of the sources of data and the context in which the data was originally submitted. It is therefore, important to have a structure that guides the execution of the research process. Reliable and credible data provides a basis for providing unambiguous answers to the research objective or main research question. The choice of the adopted research design determines the extent to which this is achieved.

As Bryman (2010) further explains, a research design provides a framework for the collection and analysis of data. The choice of a framework or structure reflects decisions about the priority given to a range of dimensions and it employs different methods; case studies are an example. A case study entails the detailed exploration of a specific case, which could be a community, person or organisation and is bound by time and activity. Time and activity are key in case studies because of the need to stay reliable, relevant and valid. Dal & Hak (2008)

sums it all up by defining a case study as “*a study in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected, and (b) scores obtained from these cases are analysed in a qualitative manner.*” The above definition is most relevant to this study because it contains two critical aspects of the case study approach i.e. the real life context of studying a selected subject and the manner of analysing obtained data- qualitatively. The qualitative methodology compliments the case study approach in that it focuses on people’s own written or spoken words. It is a way of approaching the empirical world (Taylor et.al 2015) by emphasising and identifying with the people being studied. Through interpreting of collected data, this method provides an understanding of the people’s point of view by following the sequence of events.

In this case, my case study is a research based technology developed by the UiT and has been licenced to Literate AS for commercialization. The technology’s methodology is based on standard and specific provisions on learning disabilities testing and diagnosis and is an improved version of what is currently available on the market. Conducting research based on the case study approach allows me to carry out fieldwork by working directly with Literate AS, Plus Point the company that is developing the digital version of the product, conducting interviews on the product with potential customers as a way of identifying and empathizing with the project’s mission.

There are several methods of data collection and these include questionnaires, structured and unstructured interviews, observations, focus groups and analysis of published documents. In this case study primary data shall be collected through interviews, questionnaires, analysis of documents and semi structured interviews. The data collection process will start with a stakeholder mapping (see appendices) in order to identify the key stakeholders, their interests in learning disabilities testing and diagnosis, their level of influence and buying power. Questionnaires (see appendices) will be distributed in person and via emails to individuals with or affected by learning disabilities and dyslexia. Structured interviews will be conducted with officials from Norwegian Welfare Administration (NAV), Pedagogisk Psykologisk Tjenester Nordland fylkeskommune (PPT), high school teachers, driving school instructors and human resources managers at ISS and Rehabiliteringssenteret Nord- Norges Kurbad (RNNK) and software developers at Plus Point. Face to face interviews will allow me to observe the respondents’ non- verbal cues, particularly when I interview individuals diagnosed with learning disabilities. This process is critical in confirming the assumption of

stigmatization that has been alluded to in earlier studies and the need for a solution that is end user focused.

Documentary analysis will be carried out using online publications on competitor's annual reports, official statements in the media, legislative provisions and developments in intellectual property rights, learning disabilities assessment processes and initiatives in the work place and at school, international regulations on learning disabilities and government white papers. All this information will be analysed in order to get an understanding of the national and international trends in the subject matter. Secondary data to be analysed will be limited to officially published documents to maintain credibility and authenticity.

The design thinking methodology is a new human centred approach to product development in innovation, designed to meet and address users' needs and desires in every sense. The design thinking process, from empathy through to testing of prototypes is designed to make innovations connect the innovator to the end user, have a clear understanding of all stakeholders and their power of influence at different stages of the product life cycle. The design thinking process is vital in design strategy, product management and market analysis. In this case study the design thinking methodology will help me to know more about the learning disabilities and dyslexia tool kit by connecting me with the key stakeholders in the market, understanding the market needs, technological trends that may impact in my product. Through the stakeholder mapping, I intend to gather knowledge on the people who are interested in my product as well as their level of influence on the success of the product on the market.

1.7 Limitations

Limitations of the case study submitted in this section are based on concerns that in my opinion added particular constraints to the process of writing this thesis and may have in a way influenced results submitted in the thesis. The first limitation was the language barrier. Although the idea presentation was provided in English, all official documentation including the idea's technical description were in Norwegian. I am not a native Norwegian speaker but have a good understanding, therefore, there is the potential that some information could have been interpreted out of context. I also faced some challenges during my interviews as most respondents were comfortable using Norwegian words if they felt they were not making their

point clear in English. It was also a challenge because I did not get a chance to practically use the test.

The second limitation is that the available IPR provisions applicable to products in this market can be manipulated since the methodology for testing and diagnosing learning disabilities is not patentable. For that reason, respondents in the industry were not keen on sharing much information and were also guarded on how and what they said during the interviews. Another limitation is that the product is in its early stages of transitioning from an academic research to a product for the market. Information on the product is largely descriptive with no graphic illustrations to explain the innovation. I had to use my experience in research and development of learning materials for special education to develop graphic illustrations on the technical description of the innovation.

1.8 Reflections and Summary

In this section I present my personal reflections about my experience working on this case study and being part of the academic entrepreneurial team that contributed to the commercialisation of the Literate AS tool kit. I will discuss my three major take-aways from the experience and conclude with a summary of the research process. This thesis focused on developing a commercialisation strategy for an innovation developed by the UiT. The process of developing the commercialisation strategy which focused on answering the main research question, *“How to commercialize a research based technology for testing and diagnosing learning disabilities and dyslexia in Norway?”* involved drawing from all the key courses taken on the Master degree in Business Creation and Entrepreneurship.

The main objective of the thesis was to show the importance of academic entrepreneurship in contributing to sustainable economies through the commercialization of university inventions. The thesis aimed at highlighting the importance co-operations between the universities as idea providers for industry and government support in funding ideas that would otherwise remain academic presentations. As a student being involved in the case study itself gave me a chance to have a feel of the transitioning process, from academic to industry. Three specific processes in the commercialisation process were important in showing the challenges academic entrepreneurs face in commodifying their inventions. The innovation study highlighted the importance of having a good understanding of the type and appropriability of an innovation to

industry, particularly its value proposition. This was more important in incremental-sustainable innovations like the Literate AS case because the unique element in the invention had to be framed in a succinct way that it will be attractive to the industry. Failure to do this has the potential to have the innovation dismissed as not worthy of commercial value.

The role for markets for ideas was another important factor in developing a commercialization strategy of a university based invention. Writing this thesis made me realise that besides the intellectual property value in the novelty of an invention, the market for ideas was fast paced. Once a decision is made to commercialize an invention, the process should not take too long before the innovation goal is realised. Prolonging product launch can potentially rob the invention of its commercial value as it can be easily overtaken by newer inventions. In this thesis I established that usually academic entrepreneurs are experts in their “scientific” professions and may not have enough knowledge to manoeuvre the business environment and follow through the concept of business development and strategy formulation. Out-sourcing this function may also be expensive for academic start-ups and having students like myself work on the commercialization of their invention is a merit.

Last but not least is the importance of knowing how to frame the novel or unique values of the invention so that it realises economic returns in the Business Plan. From my experience in writing this thesis, developing the business plan is important in the commercialization of innovations because it converts an exciting and academic idea into financial value. Framing the idea in a clear and concise manner has proved in this thesis that no matter how small an incremental value is in an innovation, the way it is packaged is what culminates in a successful commercialization strategy.

Below is a summary of the research process as illustrated in Fig. 1.

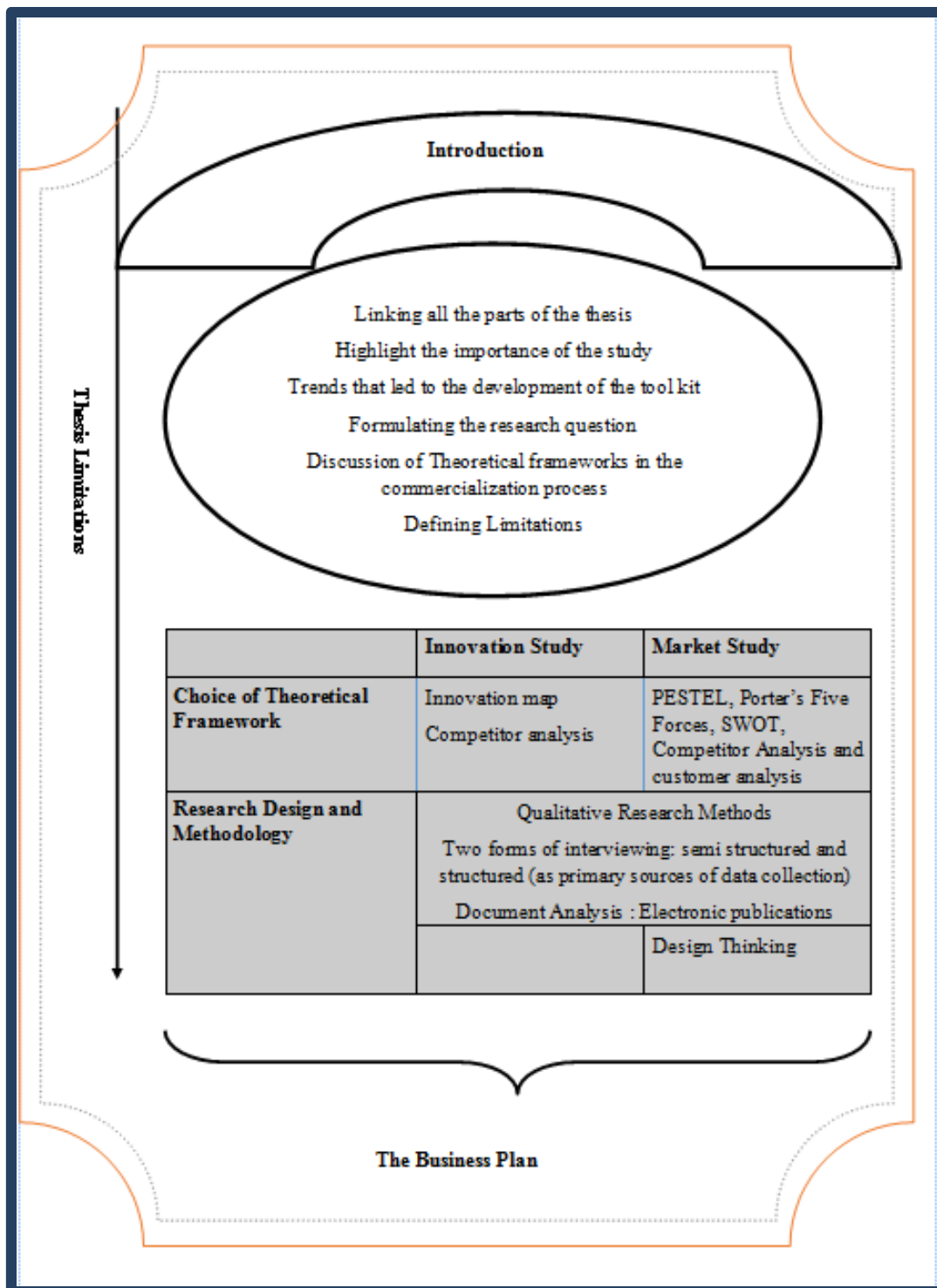


Figure 1: An Overview of the Research Process

The introduction chapter outlined the theoretical framework and highlighted the importance of the study. In the innovation study- Chapter 2, Petrusson's (2004) "innovation map" model was used to contract the product's technical functions, user utilities and structural controls.

The objective was to establish the product's value propositions. The section also analysed the product's innovation level and market impact.

Chapter 3 on the Market Study had the objective of developing a market strategy for the product. This was achieved by identifying and analysing market opportunities using the PESTEL, Porter's Five Forces and the SWOT analyses. Through this process I could critically evaluate the market needs, motivations, competitors and customers. Findings from the market study informed the submissions and projections made in the Business Plan- Chapter 4. The Business Plan is the answer to the thesis' objective and is submitted as a tool to guide the commercialization of the Literate AS tool kit.

The work is ongoing and this thesis paved way to start negotiations on seeking funding for translating the product into Sami and also to start normative studies for the African market.

2. Innovation study

2.1 Introduction

The technical study of the Literate AS invention will be presented in this chapter. The Chapter is guided by the following sub-research question; “*What is the end user value proposition and innovation position of the Literate AS tool kit for testing learning disabilities and dyslexia?*” following a modified innovation map model based on the framework presented by Petrusson (2004). This chapter will critically analyse the innovation potential of the Literate AS technology. This model follows elements of technical functions, design and structural controls.

According to Petrusson (2004) the most valuable asset in most firms today are intellectual, investors and business developers are always on the look-out on innovations’ value offering that would generate financial returns when commodified. Understanding the value proposition of any innovation is crucial in developing and evaluating an organisation’s business strategy. Therefore, in this study I will provide a visual presentation of the key intellectual elements of the Literate AS innovation. This presentation will be explained in the technical description section in order to demonstrate the technical functions and structural controls and their relationship to user utilities. The chapter concludes with determining the innovation level of the technology. A conclusion is presented that summarizes the chapter, answers the sub-research question stated above and provides an insight into how the results of this study affects the market study in the next chapter.

2.2 Technical description

Learning disabilities are multi-dimensional. Learning disabilities include a reduced ability to understand new or complex information, to learn new skills, (impaired intelligence) with a reduced ability to cope independently (impaired social functioning) which started before adulthood, with a lasting effect on development (Emmerson and Heslop, 2010) and (Nergård-Nilssen, 2006). This definition is broad and depicts the multiplicity of learning disabilities. Adult health and social care terms like special educational needs, moderate learning difficulties, severe and profound multiple learning disabilities are used interchangeably with learning disabilities. In addition to the above are people with specific learning disabilities like dyslexia and autism.

Screening and testing for learning disabilities is equally complex because there are a range of indicators that are accepted as implying that an individual has learning disabilities. These include having significant difficulties since childhood with the obvious being screening positive for learning disabilities using a “validated screening” tool kit. Validated screening tool kits primarily look at an individual’s basic psychological processes in understanding written or spoken language that influence their ability to read, write, speak, think, listen, spell or do mathematical calculations.

The core objective for testing for learning disabilities is to help individuals suspected of having learning disabilities establish their disability as well as seek remedial solutions that will make them improve their general and academic functioning. The Colorado Department of Education (2004) identified eight specific areas that are considered when eligibility for learning disabilities is being determined, i.e. comprehension, fluency and decoding, written and oral expression, mathematical calculation and problem solving and listening (Ashraf & Najam, 2014). Individuals with learning disabilities put more effort and struggle to cope with tasks and as a result of poor performances they may experience low confidence, poor self-esteem, depression, anxiety, embarrassment, confusion, anger and unpleasant emotions (Elbaum et. al 2000). Available test kits on the Norwegian market primarily focus on reading, writing, spelling and mathematical calculations.

Literate AS offers a digital screening and diagnosis test kit that can determine and detect various aspects of learning difficulties in both youths and adults, target age group 16-65 years old. The kit comprises of six subtests i.e. spelling, word identification, phonological decoding, writing efficiency test, reading comprehension test and vocabulary test. The tests contain an additional two sub tests which are not available in any other product on the market. These subtests provide a holistic overview of an individuals’ learning disorders and have shown over 90% sensitivity and 73% specificity in discriminatory power. There are two kinds of reading disorders which are; *reading comprehension deficit* and *dyslexia* and the test covers both. Dyslexia is a neurobiological disorder characterized by difficulties in word recognition and spelling, resulting from a deficit in the phonological component of language (Green, et al., 2009). The test takes 45 minutes to administer and can be administered by trained teachers.

Compared to other products on the market, the Literate AS product is designed in such a way that the results provide an indication of the underlying causes for an individual's poor performance. For instance, if one performs poorly it could be because they did not comprehend the text they read or maybe because they did not finish reading the text and could not answer the questions within the stipulated time. If they gave a wrong answer, then it could be because they have poor vocabulary skills. Or maybe they have a huge decoding problem due to deeper learning disabilities like dyslexia. While the test kit on its own is not the complete solution to the challenge of school drop outs and dependence on the social welfare system, it is designed to bring to the surface the underlying disabilities that may cause frustrations in individuals with learning disabilities. Once these specific challenges are established, these individuals will be given a chance to seek remedies available that may help them to perform better. To this end, Literate AS will also provide competency and training to the test administrator's within the customer's organisations. Consultancy services in further socio-psychological professional assessment is then offered where results indicate a positive in learning disabilities. The technical architecture of the invention is presented below.

2.3 Technical Architecture

Figure 1 below outlines the technical architecture of the Literate AS test kit for learning disabilities and dyslexia. The outline covers test distribution and access, answer processing and scoring as well as back up storage and data security.

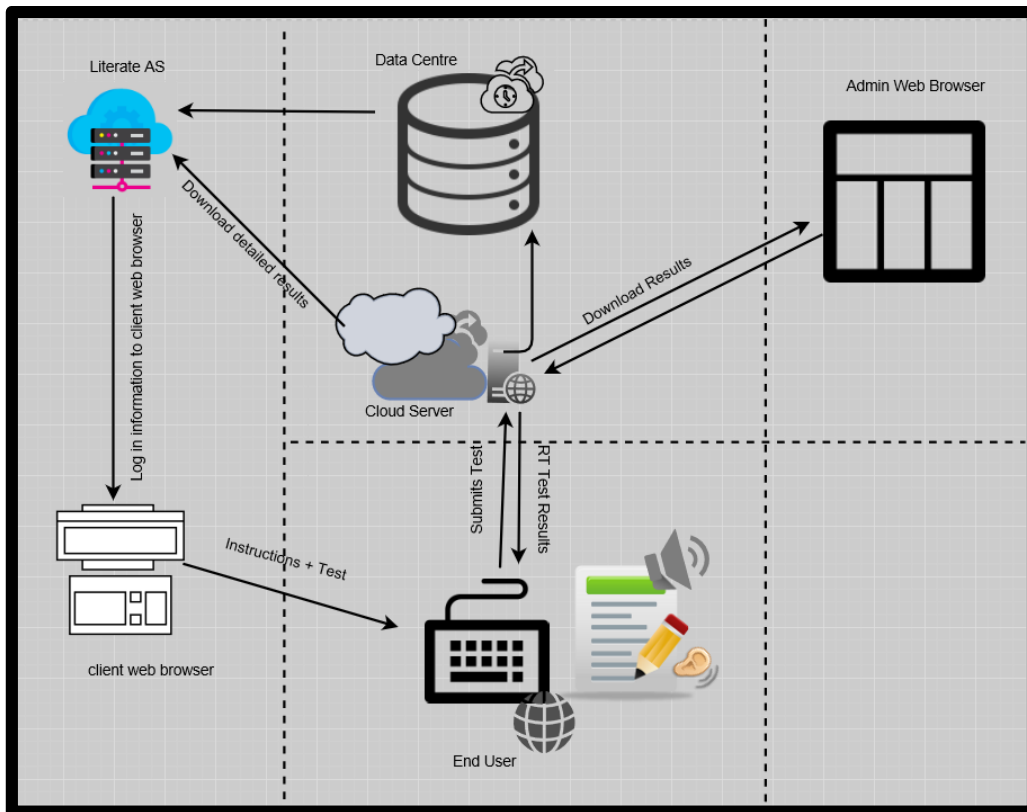


Figure 2: The Technical Architecture of Literate AS' Tool Kit

The process starts with Literate AS releasing a list of log in information to the client web browser. The test administrator in the client's organization then distributes the log in information to the individuals taking the test (these are labelled as the end user in the illustration). Each user name and password is only used once and it becomes the end user's identity on the cloud server. The end user will log in and start the testing using a device with a keyboard and is connected to the internet. The first page requires the user's personal information after which they can start completing the test. All six subtests are taken in one sitting and are timed. The cloud server processes the answers in real time so each time a test is completed the results can be immediately downloaded from the cloud server and sent to the end user by the test administrator. Literate AS. The test administrator at Literate AS has access to detailed test results for each end user and where learning disabilities are detected they recommend necessary remedial action to the client test administrator. The results are also encrypted and transferred to Literate AS' data base stored at Norway's Data Centre. Access to the encrypted results is restricted to Literate AS and log in access is limited to the data controller at Literate AS.

The emphasis from the above technical architecture is the fact that this digital version of learning disabilities is time efficient since a group of people can take the test simultaneously and the results are processed in real time. This process eliminates probability of human error in processing and scoring results because all these processes are done by the software in the cloud server. There is also the element of increased data security. Results of each test are encrypted and stored onto Literate AS data base located at a central Data Centre in Norway. Access onto the data base is log in secure and can only be accessed by the data controller at Literate AS.

2.4 Innovation map

Petrusson's (2004) innovation map is a valuation model for technological innovations used as a normative instrument to deconstruct and design innovations, ventures and even markets. The Literate AS product was created from an iterative process of longitudinal studies on learning disabilities and dyslexia. It is a product developed from reviewing the missing link in the customer needs in improving the efficacy of learning disabilities administration in Norway, ((Hausstatter & Thuen, 2014), (Nergaård- Nilssen, 2006)). The common factor in these studies is that they recommended a new set of practical and scientific knowledge for developing an effective learning disabilities administration system, hence the invention of the tool kit to be evaluated in this section. In order to appreciate the value proposition of this innovation, this study adopted the innovation map by Petrusson (2004). The model map of the substantial building blocks in an innovation has five development levels that identifies material artefacts, virtual artefacts, intellectual building bricks, concepts and distinctive marks and proposed experienced values.

According to Petrusson, the innovation maps serves different purposes and these include; i) to visualize which substantial elements in an innovation have been successfully constructed and or are most likely going to be constructed, and ii) strategically visualize which substantial building blocks have to be claimed, if the innovation is going to be a commercial success. Today's industries are highly competitive and businesses are constantly looking and increasing their market share while at the same time creating vanguards around already possessed market shares. The UK Office of Science and Technology has dubbed innovation as the "motor of modern economy, turning ideas and knowledge into products/ services",

(Tidd & Bessant, 2009). This assertion is what makes innovation critical to modern day firms as it brings increased economic value to the establishment and prepares the firm for the future as they commodify their intellectual assets. Therefore, Petrusson’s uses of the innovation maps provides a framework for identifying the different intellectual levels on which to evaluate an innovation’s market potential. Using these guidelines, this study constructed the innovation map for Literate AS as shown below in Fig. 2.

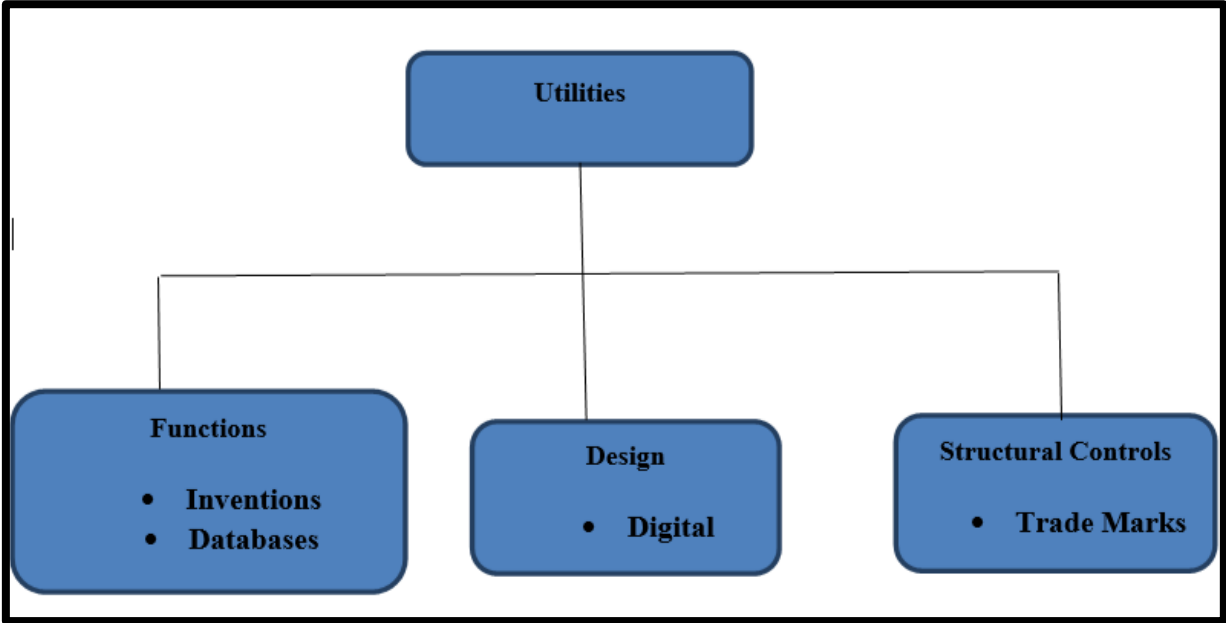


Figure 3: Innovation Map for Literate AS (adopted from Petrusson's 2004 Model)

The key elements in the innovation map that have the potential of making the innovation a commercial success are the product’s functions, design and structural controls in the form of trademarks and licences. These distinct claims interact in providing user utilities that sets the Literate AS’ tool kit apart from the rest of the competition on the market. The Norwegian market for learning disabilities test kits has long known brands and this innovation map will be used to draw a comparison between Literate AS’ proposed customer utilities and what the main competitors are currently offering. A detailed competitor analysis is also available in Chapter 3 under the Market Study. Petrusson (2004) emphasises that in a start- up situation like the Literate AS case, it is important to question which utilities and other values are to be realised as well as how the innovation will be identified. This is significantly important to this study as it provides a basis to clearly present the value of the innovation to all stakeholders in

the value chain. Mapping of Literate AS' intellectual claims is therefore a process of deconstructing the conceptualised technical proposition and unpack it in order to realise specific utilities and other values that makes the invention a worthy commodity on the market.

2.3.1 Functions

Innovation is not a unified framework, some innovations disrupt, destroy and make obsolete established competences while others refine and improve. Therefore, different kinds of innovations require different kinds of organisational environments and different managerial skills. The technical functions of the Literate AS tool kit enable users to provide a holistic assessment of an individual's learning disabilities. The tool kit assesses the core elements of reading disability, writing disability, vocabulary, spelling, phonological and comprehension skills. This process of evaluating learning disabilities provides a comprehensive outlook of an individual's learning disabilities. List of functions and illustrations (in Norwegian) are as tabulated below. More illustrations are available in Appendix 3.

| List of Functions | Illustration |
|--------------------------------|---|
| 1. Test for writing efficiency | <p>1. Orddiktat: Kartlegging av rettskriving</p> <hr/> <p>Tid til gjennomføring: Ingen tidsbegrensning. Instruksjon gitt av testleder til den eller de som testes: <i>Jeg skal nå si noen ord som du skal skrive. Hvert ord blir presentert i en setning, og så gjentar jeg det ordet du skal skrive.</i></p> <ol style="list-style-type: none"> 1. Jeg må skaffe meg kinobillett til i kveld. Skriv kinobillett. 2. Det står her hvordan man skal gjøre det. Skriv her. 3. En meteorolog jobber blant annet med å varsle været. Skriv meteorolog. 4. Hvete er en av de fire kornslektene som dyrkes i Norge. Skriv hvete. 5. Et gjerde er en oppsatt stengsel mellom eiendommer. Skriv gjerde. |

| | |
|--|--|
| <p>2. Test for word identification</p> | <h2>2. Ordkjedetesten: kartlegging av hurtig ordgjenkjenning og ortografisk kunnskap</h2> <hr/> <p>Ordkjedetesten:</p> <p>Du skal nå få se flere ordkjeder. Alle ordkjeder består av fire ord hvor mellomrommet mellom ordene er fjernet. Din oppgave går ut på å sette strek der mellomrommene er fjernet. Husk at alle ordkjedene består av <i>fire</i> ord.</p> <p>Eksempel:</p> <p>1. påskelastmilfra 2. løstuppmegea 3. ostparvaskjakt 4. husgreisåser</p> <p>Løsning oppgave 1: påske last mil fra Løsning oppgave 2: løs tupp meg sa Løsning oppgave 3: ost par vask jakt</p> |
| <p>3. Test for phonological decoding</p> | <h2>3. Pseudohomofontesten: Kartlegging av fonologisk prosessering og bevissthet</h2> <hr/> <p>Instruksjon til pseudohomofonprøven:</p> <p>Hensikten med testen: Kartlegge fonologisk prosessering og bevissthet.</p> <p>Utstyr: Nedtellingstidtaker, protokollen for pseudohomofontesten og skrivesaker.</p> <p>Tid til gjennomføring: 2 minutter.</p> <p>Instruksjon: "Dere skal nå få lese noen linjer med tulleord. Disse tulleordene betyr ingenting, og dere har nok verken sett eller hørt dem før. Likevel går det an å lese disse tulleordene. Og når dere leser dem stille inni dere, vil dere oppdage at noen av tulleordene høres ut som ordentlige ord. La oss se på eksempler".</p> <p>Eksempler til oppgaven "Finn ord som høres ut som ordentlig ord":</p> <ol style="list-style-type: none"> omkel øsk helefooter <u>løn</u> <u>slå</u> nå modil vaks mikle luppe ørte <u>ve</u> |
| <p>4. Test for writing fast/spelling</p> | <h2>4. Skrivehastighet</h2> <hr/> <p>Instruksjon til skrivehastighet</p> <p>Hensikten med testen: Måle nøyaktighet og effektivitet i skrivning.</p> <p>Utstyr: Nedtellingstidtaker, protokollen for skrivehastighet og skrivesaker.</p> <p>Tid til gjennomføring: 2 minutter.</p> <p>Instruksjon gitt av testleder til den eller de som testes: "Den neste testen er ment å måle hvor <i>raskt</i> og <i>nøyaktig</i> dere greier skrive under tidspress. Jeg kommer nå til å presentere dere for en setning. Denne setningen skal dere skrive igjen og igjen, så nøyaktig og så mange ganger dere greier, i løpet av 2 minutter. Setningen står på arket du skal skrive på, slik at du kan se tilbake på den så mange ganger du har behov for det. Setningen dere skal skrive er:</p> |

| | |
|--|--|
| <p>5. Test for reading comprehension deficit</p> | <p>5. Leseforståelse:</p> <p>Instruksjon til leseprøven:</p> <p>Hensikten med testen: Måle leseforståelse.</p> <p>Utstyr: Nedteilingstiltaker, lesetekst, protokollen for skrivehastighet og skrivesaker.</p> <p>Tid til gjennomføring: 10 minutter.</p> <p>Instruksjon gitt av testleder til den eller de som testes: "Den neste testen er ment å måle leseforståelse. Dere skal nå få lese en tekst. Etter teksten følger noen spørsmål som dere skal svare på. Det er lov å gå tilbake til teksten for å svare på spørsmålene. Dere får nøyaktig 10 minutter til å lese teksten og svare på spørsmålene. Dersom dere ikke er ferdige når tiden er ute, vennligst sett en strek eller et stjerner som viser hvor langt dere var kommet i teksten eller med spørsmålene. Har alle skjært hva oppgaven går ut på?"</p> <p>Spørsmål til teksten. Kryss av for riktig alternativ:</p> <p>1. Hva er Semmelweis mest kjent for?</p> <p>a. at han fant ut hva som er årsaken til barsefete _____</p> <p>b. at han oppdaget sammenhengen mellom manglende håndvask og barsefete _____</p> <p>c. at han trodde det var stamjordiske årsaker til barsefete _____</p> <p>d. at han ble oppdagt fra stillingen og involgt i rasekrøket _____</p> <p>2. Hva ble kullensavnet til Semmelweis etter hans død?</p> <p>a. "Bakteriologens far" _____</p> <p>b. "Håndhygienens far" _____</p> <p>c. "Kvinneløsten" _____</p> <p>d. "Mødrenes Feielse" _____</p> <p>3. Når er barsefete?</p> |
| <p>6. Test for vocabulary</p> | <p>6. Ordforståelse</p> <p>Instruksjon til Ordforståelse</p> <p>Hensikten med testen: Kartlegge bredde og dybde av vokabular.</p> <p>Utstyr: Protokollen for vokabular og skrivesaker.</p> <p>Tid til gjennomføring: Ingen tidsbegrensning.</p> <p>Instruksjon gitt av testleder til den eller de som testes: Den neste prøven er ment å måle ordforståelse. Dere skal nå få se ei liste med 15 ord. Hver av disse femten ordene er så etterfulgt av fire ord. Ett av disse ordene er et synonym til mål-ordet, dvs. at det betyr akkurat det samme. Oppgaven deres går altså ut på å finne det ordet på hver linje som betyr det samme som det uthevede ordet først på linja. Har alle skjært hva oppgaven går ut på?"</p> |

Table 1: List of Literate AS' Invention's functions

The above table presented six functions of the Literate AS tool kit. These functions make up the first key element of the innovation map.

2.3.2 Design

Design is the second key element of the intellectual building block in the construction of an innovation. The advent of technological innovations has brought about a challenge for organisations in terms of keeping abreast with global trends. While it is usually assumed that users' unmet needs influence the creation of innovations, tailor made to satiate the need in a more linear like process, reality recommends engaging users throughout the product development process (Solomon et.al 2013). Users are usually more informed and know what they want, how they want it packaged, how they intend to buy it, how much they are willing to pay and how they intend to use the product or service. As an intellectual building block, the

product design focuses on the actual structural design and how it differentiates the product as a unique invention.

According to Petrusson (2004) by applying the innovation mapping model, the entrepreneur can map the utilities and values that are to be realised. Literate AS' tool comes in a digital format. As a digital product, the utility values are increased. Unlike the traditional pen and paper test kit used by Literate AS competitor's the digital version is time efficient, producing results in real time. This element takes away the burden of physically going through each test by the administrator, assessing and scoring the test manually. It has increased security controls on personal data storage and back up and most importantly it eliminates the probability of human error in results processing and scoring. The process to determine the product design also revealed that Literate AS could realise more in terms of protecting its product's methodology under intellectual property rights by developing a digital product over a pen and paper test kit. The digital version requires an author licence, username and password to access the test from the cloud server, customers can not share it for free. Therefore, the utilities and values embedded in the Literate AS' product design are beneficial to all parts of the value chain.

2.3.3 Structural Controls; Trademarks

In this study trademarks are evaluated as the intellectual building block for structural controls on the innovation. Trademarks provide quality assurance by inducing the trademark owner to maintain a consistent level of quality, and allows consumers to rely on it (American Bar Association, 2009). Literate AS' innovation cannot be patented because it lacks a "technical solution" according to the Norwegian Patent Act. However, there are other structural controls that are applicable to the innovation such as trademarks, the digital tool kit itself, licences, non-disclosure agreements with customers and logos. A trademark is a means or a vehicle that distinguishes a product of one's own creation from other similar products by conceptually capturing the experienced values of the product. These can be a symbol, phrase or words legally registered or established by the use as representing a company or product. In entrepreneurial activities, the trademark is in early stages, only a value vision, and at a later stage actually becomes a value proposition and an experienced value, (Petrusson, 2004). Literate AS will register its name and logo as its trademarks because they represent the legacy

that the company is building. Literate AS will also sign non-disclosure agreements (NDAs) with its customers in order to protect its methodology. This will give Literate AS leverage on the market as the only one testing for the six specific learning disabilities and dyslexia indicative areas.

2.3.4 User Utilities

All the three elements discussed above feed into the user utilities thereby revealing the value proposition of the innovation. User utilities are also relevant in exploring how the other elements of the innovation map discussed earlier add value to the end user on the market. This section discusses the functions, design and structural controls in relation to the concept of user utilities.

The Literate AS tool kit provides a holistic approach to testing and diagnosing learning disabilities and dyslexia. By evaluating an individual's spelling, word identification, phonological decoding, writing efficiency, reading comprehension and vocabulary skills, the tool kit goes deeper and provides a comprehensive overview of an individual's disabilities. The test provides an indication of the more specific disability, be it reading comprehension, spelling, and phonological decoding etc. as the strongest disability will score high on the result score card. Once these weaknesses are identified it provides a basis for the relevant authorities to implement customised remedial solutions that specifically address the disability identified. For example, if an individual is out of work due to limitations attributed to reading deficiencies, when NAV place them back at work, assistive tools are also made available so that they perform better at their tasks. The important utility value is that the individual is empowered to be self-sufficient and efficient at tasks.

The tool kit comes in digital format making it environmentally and user friendly, accessible regardless of geographical location and provides results in real time. The whole test is digitally processed thereby eliminating the risk of human error in scoring results. A key user utility that guarantees results credibility and authenticity. The digital test kit also eliminates the danger of reverse engineered pirated copies as copies of the test kit are only available from Literate AS' official website and require an author licence before they can be accessed from the cloud server. The digital format also enhances the critical aspect of Data Protection

and back up which guarantees user confidentiality, a utility value that is attractive to many users.

Consultancy and training of administrators is done by the CEO, at least in the interim. The CEO is an expert in issues of learning disabilities and dyslexia thereby ensuring that the professional socio-psychological assessments, evaluations and recommendations are credible. The test kit tests for both reading comprehension deficit and dyslexia which are the two types of reading disorders. This creates an extra utility in addition to basic screening as users will get professional assessment for both. By separating reading comprehension from dyslexia, the user gets a comprehensive assessment which other products on the market are not delivering. The table below presents a summary of user utilities derived from the key building blocks of the Literate AS innovation map.

| Description | Utilities |
|---|---|
| 1. Digital Form | Credible and authentic result- eliminates human error in scoring the test |
| 2. Accessed by author licence | Eliminates the danger of using pirated, reverse engineered tool kits |
| 3. Tests six sub tests out of the eight standard set test in learning disabilities screening | Provides a comprehensive overview of an individual’s needs |
| 4. Secure log on procedure | Enhances data protection on user’s confidential information |
| 5. Design | Technologically compliant, user and environmentally friendly. |
| 6. Structural control | Credibility, authenticity and reliability |
| 7. Consultancy | Socio- Psychological professional evaluation and assessment |

Table 2: Summary of Literate AS Tool Kit's User Utilities

Consultations with officials from NAV, Tromsprodukt AS, PPT Videregående skole Nordland who have used the prototype during pilot testing confirmed the above as user utilities. The identified user utilities are also a reflection of the value proposition for the customers

2.4 Competitor Comparison

Now that the user utilities and other key elements of the innovation map have been discussed, this section will compare the Literate AS' innovation to similar products on the market. This process is important in order to highlight characteristics of Literate AS' kit that separates it from the rest of the market players in Norway. Once this is established, a clear value proposition for Literate AS will be presented.

Currently, validated screening tests for learning disabilities are constructed around the accepted definitions and recommendations by the WHO and the UN based on the eight specific areas for learning disability screening highlighted earlier in this chapter. These standardised tests evaluate individuals for competences in writing, reading, speaking, thinking, listening, spelling, vocabulary and doing mathematical calculations. In this section a total of 9 key competitors are analysed. The analyses consider the product design, how it is administered, administration time frame, target group, results scoring and interpretation model. A detailed competitor analysis is also available in the Market Study Chapter.

| Column 1 | Literate AS | Kartleggeren | Carlsten-Testen | Ordlydetesten | Setningseprøve | Språk 6-16 | SOI | STAS | UDIR's Test Kit | Logos |
|---|-------------|--------------|-----------------|---------------|----------------|------------|-----|------|-----------------|-------|
| Pen & Paper | x | | x | x | x | x | x | x | x | x |
| Digital (No distribution of free copies) | (x) | x | | | | | x | | x | |
| Group Testing | x | x | x | x | x | | x | x | x | x |
| Individual Testing | x | | | | | x | x | x | | |
| Primary School Grade 1-7 | | x | x | x | x | x | x | x | | |
| Secondary School Grade 8-10 | | x | x | x | x | x | x | x | | x |
| Upper Secondary School | x | x | x | | | | | x | x | x |
| University + Adults | x | | | x | | | | x | x | x |
| Generates Report and Work Plan for Rerr x | | x | | | | | x | | | |
| Digital System with previous results | | | | | | | x | | | |
| Administration Time Frame | x | x | | | | | x | | | x |
| Personnal support and monitoring | | | | | | | | | | |
| Screening & Diagnostics | x | | | | | | | | | x |

Table 3: Overview of Literate AS Competitor's Analysis

The above competitor analysis indicates that Literate AS has a good chance on the market regardless of the competition posed by established brands. Literate AS' value propositions in terms of design and functionality are better than what the market currently has to offer. Key attributes that are peculiar to Literate AS brand are that Literate AS is the only one on the market that has a test kit in Sami language. Literate AS is also the only company that offer their product digitally but as a sold product- there are no freebies. This gives Literate AS control of who gets or purchases their product. Since Literate AS wants to keep the product methodology as a "trade secret" to eliminate piracy by competitors, they have decided to sell their product to traceable customers. Also, through counselling and training test administrators, Literate AS is the only one among its competitors that offers socio-psychological support and monitoring. This is a value adding characteristics as it portrays Literate AS' product as a tool designed to assist and empower the individual with learning disabilities and not to merely single them out as a statistic.

Literate AS is one of the two products on the market that screen and diagnose for learning disabilities and dyslexia. This implies that Literate AS will be at an advantage on the market as it comes with more customer oriented offerings. The Literate AS tool kit's unique elements

work to the company's advantage in leveraging competition thereby increasing chances of making the commercialization of the tool kit a success.

However, the above competitor analysis table also indicate that Literate AS faces stiff competition from Kartleggeren and Logos. Kartleggeren is an online tool kit that tests student skills in basic subjects in Norwegian, English and Mathematics from 5th Grade going up. Kartleggeren is a product of Fagbokforlaget, a company that has the biggest portfolio in the education segment in Norway. Logometrica, the owners of Logos, develops screening test and diagnostic tools for individual assessment of reading disabilities. See Appendix for a detailed company overview. All the other competitors except Kartleggeren seem to be fixated on the pen and paper test and target the same age group of youths and adults aged 15-65 years.

2.5 End user value proposition

Value proposition represents tangible and intangible value offered by a role towards another role, (Berger & Kuckertz, 2016). It is a promise of value to be delivered presented as a business or marketing statement stating why a consumer should buy the services of one supplier over the other. This statement is usually framed around a customer's unmet need or pain and can be related to the newness of the product or service proposing how it will deliver to the customer's satisfaction.

In summing up the user utilities proposed by Literate AS and comparing them to what the market has, this study proposes the following end user value proposition;

“Literate AS offers a comprehensive, holistic and reliable overview of an individual's learning disorders by testing for reading, writing, comprehension disabilities and dyslexia in youths and adults.”

A value proposition is intended to encapsulate the unique offerings of the new product. By positing that Literate AS' tool kit will present a holistic and comprehensive solution to the testing and diagnosis of learning disabilities we are alluding to its ability to generate credible and authentic results. By having the test distributed online and equally assessed online by a software embedded on the cloud server, Literate AS provides a solution to the problem of misinterpreted results when the process is administered manually as is the current situation.

As such, this invention is not only trendy and nice to have but is technically solving an unmet market need.

As a testing and diagnostics tool kit, the Literate AS invention's product design offers value in terms of accessibility, reliability and data security. The secure log in system at all points of service complimented by the storing of data in encrypted format at the Data Centre in Oslo gives the customer a sense of getting value for their money. According to Hudadoff (2009), when a product gets to the market, it is not enough to identify a product with the brand name or company's branding artefacts. Instead, the product design now hugely contributes to an innovation's market value. Over and above the packaging that the user initially bases their purchasing decisions on, it is the product's design that effectively communicate the value of the product to the customer. Product design includes quality, appearance, performance, reliability, durability, ease of use and time saving. This is more important in technological innovations because competition is stiff. The Literate AS tool kit is designed to be the best market alternative to the customer as it is the only one that will provide test results in real time. It is designed to warrant user satisfaction throughout the value chain i.e. ease of use for tests administrator, data protection and reliable test results for the individual taking the test and efficient administration of services for Literate AS.

2.6 Verification process and technological limitations

The verification process is the process of describing specific further development and testing of an idea and serves as means for applying for government grants or other funds (Lundquist 2014). This process was critical in the Literate AS tool kit product development. The product was initially produced based on the pen and paper test kit. After conducting a market survey and carrying out an empathy process, Literate AS decided to produce the tool kit in digital form only. The product has been pilot tested at Tromsprodukt AS to assess individuals who are out of work for various reasons in the Vocational Occupational Rehabilitation project together with NAV. Tromsprodukt AS is a Tromsø based enterprise in work and social inclusion. The rehabilitation company's main task is to help individuals that are out of work by reintegrating them into the work place.

Results from the test confirmed that the tool kit is reliable and credible. Feedback from the users also indicated that the test showed 90% sensitivity and 73% specificity in discriminatory power. The product was also pilot tested at Pedagogisk Psykologisk Tjenester (PPT) Videregående skole Nordland and the customers reported that it was a comprehensive, time efficient product with ease of use and accurate results. PPT Videregående skole Nordland is prepared to sign a letter of intent to buy the product once it is ready for the market.

Technical limitations to the product are that the product cannot be patented. According to the Norwegian Patents Act (1967²) neither the methodology for the test nor the computer program for the digital version are patentable due to the lack of a “technical solution” and an “inventive step” in the product. This means that by solving a technical problem, an innovation should be able to be “utilised industrially” while the inventive step implies that the innovation should differ from those previously known. According to the Norwegian Patents Act, methods for surgical or therapeutic treatment or diagnostic methods, practiced on humans or animals, are not regarded as industrially applicable and are not patentable. Although the methodology is different from what is currently available on the Norwegian market, the technology behind it is based on standard specific guidelines for a validated screening test. Similar products are available in markets outside Norway and have been borrowed for testing individuals by different institutions in Norway. For example, a study conducted by Bjørgen et.al (2016) used the translated version of the UK developed Learning Disabilities Screening Questionnaire. While another research conducted by Green et.al. (2009) on dyslexia screening and testing in Oslo used the translated version of the Swedish Duvan screening test kit.

2.7 Innovation level and market impact

Innovation is about change, a change that creates a new dimension which takes forms that underlie the product, process, position and paradigm on which an innovation is based on (Drucker 1985). In order to successfully commercialize innovations, there is need for an organisation to be well able to organise and manage its innovation strategically, understanding and having a clear picture of where and how to position themselves in the market. These perspectives are essential in revealing the major differences in the innovation process

² Norwegian Industrial Property Office registers trademarks, designs and patents in Norway: <https://www.patentstyret.no/en/>

particularly with regards to what the product has to offer, revenue generation, research support and market potential (Kassicieh, et al., 2002). Understanding an innovation's typology will present opportunities for a new venture to adopt different commercialization strategies that will enhance its market position. Innovations are born of a need to complete the development and exploitation of new knowledge, they are about creating efficiency and user satisfaction in the value chain. In this study it is important to define Literate AS' innovation type as this is important in data collection and processing in the market study chapter. This section will analyse which innovation category the product identifies with as well as analyse the impact the innovation can have on the market.

2.7.1 Radical Innovations

Radical innovations are characterized by the way they totally change the face of a firm's existing investment in technical skills and knowledge, designs, production technique, plant and equipment. They are scientific discoveries that break through the usual product/technology capabilities and provide a basis for a new competitive paradigm. A new competitive paradigm in this instance means that the technical advancement is so significant that they make older technologies obsolete. As new competitive paradigms are discovered, radical innovations tend to present unique challenges and opportunities for R&D organisations seeking to decide on their investments and for manufacturing organisations devising plans for their commercialization efforts and meeting the challenge to reinvent the corporation (Kassicieh et.al, 2002). Radical innovations demand a lot of resources because, during the innovation process, new products and new industries are created. For this reason, there lacks a proven path from scientific discovery to mass production in radical innovation because products are created from scratch and are not updated versions of old products or technologies.

In radical innovations there is a pattern of "punctuated equilibrium" with innovation where in most cases innovation is about exploiting and elaborating, creating variations on a theme within an established technical, market or regulatory trajectory (Tidd & Bessant 2009). Radical innovations follow a more discontinuous innovation path hence they are classified as discontinuous innovations. In fact they embody new technologies that results in new market

infrastructure leading to discontinuities on both micro and macro levels, (Garcia & Calantone, 2002). This is usually the case in novel innovations. Novelty in innovations implies that the new creation has added value to the market, and in relation to radical innovations the added value becomes a complete new product.

The downside of radical innovations is that they are not readily accepted by corporate customers, until they are proven. Because they are new to the world, radical innovations do not address a recognised demand but create a demand previously unrecognised by customers (Garcia & Calantone, 2002). This process of creating a new demand is also referred to as the Blue Ocean Strategy. Leifer et. al (2000) concurs with Garcia and Calantone and explains that radical innovations transform the relationship between customers and suppliers and also restructures market place economics in the process. Hence, radical innovations usually forge a new business or industrial trajectory that was not previously charted making it difficult for them to be successful as soon as they are commercialized. However, radical innovations are popular with small entrepreneurial firms because they are more agile and are better able to deal with uncertainty than bigger firms, (Kassicieh, et al., 2002). Bigger firms have more exploits from being an established brand on the market, having a track records and have made investments spanning a lot time, thus cannot afford to discard it all and continuously create new products. So in short radical innovations are novel creations that improve existing products' performance and functionality.

2.7.2 Incremental Innovations

Incremental innovations are innovations that allow organisations to maintain a dual approach to innovation by maintaining the current production system while making small incremental changes looking for major breakthroughs in the process, (Kassicieh, et al., 2002). They increase an organisation's legitimacy because they are known to the customers and their development is usually to some extent informed by customer needs and feedback on previous existing products. Incremental innovations give way to standardization and status quo within the firm or industry, they only occur at a micro level and cause either a marketing or technological discontinuity but not both (Garcia & Calantone, 2002). The market impact caused by incremental innovations is significantly low. They follow a more continuous

improvement market-focused process and can be applied to internal and external customer problems that intensify rather than create new lab competences, (Kassicieh, et al., 2002). In incremental innovations, the space within which innovations happens is clearly defined and innovation is structured and clearly mapped out thereby adding value to an established industrial value chain. For this reason, market researches are more popular with incremental innovations because structures like business models are already in place and resources used are kept minimal because they are costs on product add-ons and not a total overhaul of the market offering.

However, the negative consequences of too much attention to incremental innovation is that it often leads to failure by some well-established firms to evolve and invest in new innovations. James Utterback and Clayton Christensen, among others, have noted how firms that dominate one generation of technology often fail to maintain leadership in the next (Leifer et. al. 2002) This is usually linked to lack of inspiration or capability or outright hubris industry leaders continue investing in the technologies that made them successful, even when more effective technologies like "disruptive technologies," are available for exploitation.

2.7.3 Disruptive vs. sustaining market impact

Disruptive innovations are innovations that improve a product or service in ways that the market did not expect, they cause a paradigm shift on the market by bringing in new thinking that focuses on what needs to be done on the market and not focusing primarily on the product or the user. A key characteristic of the disruptive innovations is that they succeed by fulfilling the needs of an overlooked market segment, gaining a foothold by delivering more suitable-functionality, frequently at a lower price, (Christensen et.al 2015). These innovations grow at a steady pace, because incumbents on the market react slowly or do not react at all as they focus their attention and resources in other higher profitability and more demanding segments. Disruptive technologies entrant trajectory targets the low end of the market moving towards the mainstream eventually tapping into the high end market niche as product performance and credibility grows on the market. Disruptive technologies are popular with small firms as the lack of attention from bigger firms allows them to build their own market niche.

On the contrary, sustaining technologies are technologies that improve product performance and are popular with large companies because they involve improving a product that has an already established market segment, (Christensen, 2000). Unlike disruptive technologies, sustaining technologies come from listening to the needs of the customers in an existing market and focus product development on satisfying the unmet needs thereby addressing future market gaps. Disruptive innovations create their successes by capitalizing on serving the needs of a customer segment that is usually ignored or are not valued by mainstream customers.

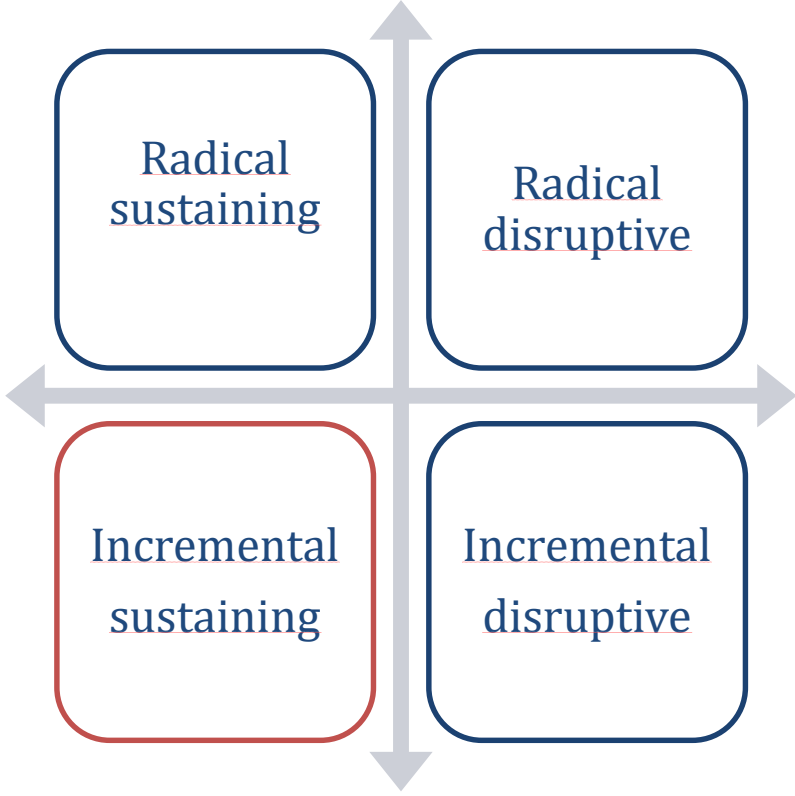


Figure 4: Mapping Radical vs. Incremental Innovations

The horizontal axis in Fig 4 above represents the Technology/Knowledge impact (top=high and (bottom =low), while the vertical axis represents the market impact (left= low and right =high). The inventions are informed by market demands. In a nutshell, radical and incremental innovations symbolise continuity and discontinuity in technological development and market impact. In the next section Literate AS’ innovation level and market impact will be analysed in relation to the innovation dichotomies of radical vs. incremental and disruptive

vs. sustaining innovations. At the end of the analysis, a modified version of the above illustration of innovation dichotomies will be presented.

2.8 Literate AS' Innovation Level and Market Impact

Incremental innovation can keep large companies competitive in the short term, but only *radical* innovation can change the game, leading the way to long-term growth (Leifer 2000). From the preceding discussion, this study defines the Literate AS tool kit as an incremental innovation with a sustaining impact on the market. The figure below illustrates the type of innovation that Literate AS relates to and its impact on the market.

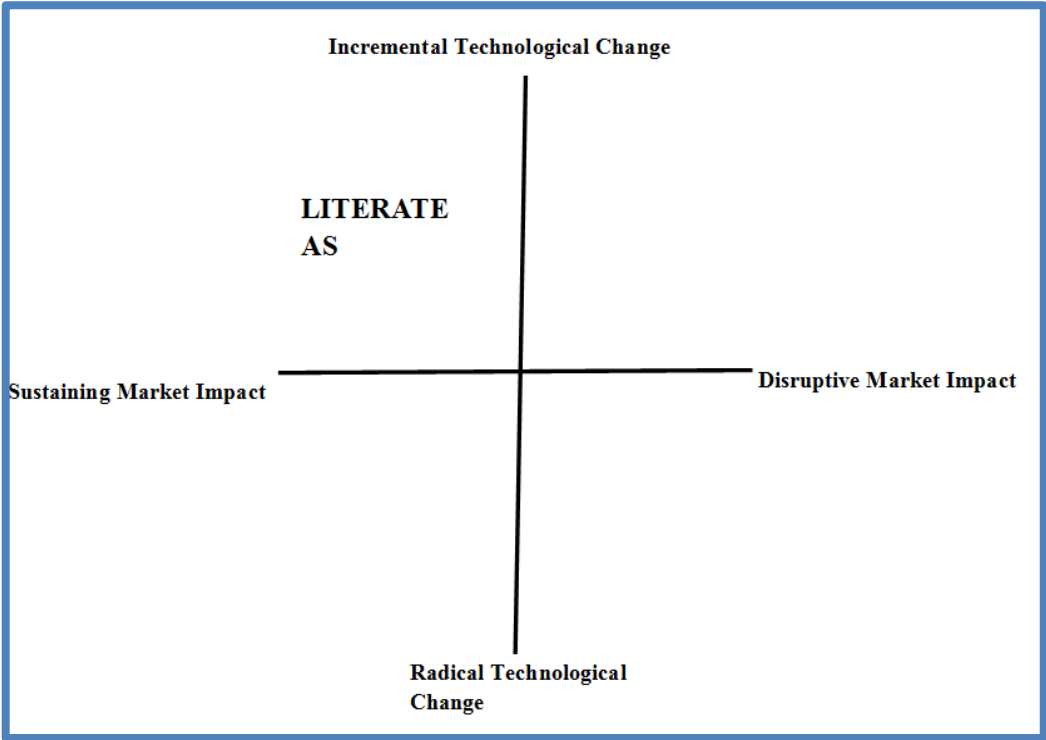


Figure 5: Literate AS' Mapping Radical vs. Incremental Innovation

The entrance of the product on the market will record an increase in the statistics of people diagnosed with learning disabilities in the target age group. This will not because suddenly people “acquire” learning disabilities but because the new product is designed to perform better than the test kits available on the market. As an incremental innovation, the product

enhances the process of diagnosing and testing for learning disabilities and dyslexia, improving the services on the Norwegian market a notch further in matching the 8 core specific elements of a validated learning disabilities tool kit by international standards.

Analysed from the characteristics of a radical innovation, the Literate AS' innovation lacks novelty of invention, it does not make other products on the market obsolete but actually adds incremental value by making them more comprehensive and technologically compliant. The product does not create a new market of people with learning disabilities but is there to close the gaps established in the market study on customers' unmet needs and pains. There have been tests conducted on people with reading and writing disabilities and the invention of this screening test will separate dyslexic individuals from individuals with reading comprehension deficit, providing tangible statistical data on specifically dyslexic individuals. Therefore, while the product impact is low on the market, at a macro level it changes the way learning disabilities cases are bundled up and provides a basis for customised remedial solutions for the diagnosed individuals.

Analysed from the perspective of disruptive versus sustaining innovations, Literate AS characterises more with sustaining technologies. Although Literate AS is not a big long established organisation, the methodology of the product development has a traceable history from different service providers on the market. The screening test focuses on providing a better testing, diagnosing, evaluating and interpreting results, most importantly separating the different types of learning disabilities and providing statistical evidence on the high drop rate in high schools and dependence on social benefits in adults. The screening test kit is there to address a social need; that of high prevalence in high school drop outs, suicides and high dependence on the social benefits system. The innovation targets the same market segments that deal with learning disabilities testing and diagnosis.

2.9 Conclusion

The objective of this chapter was to answer the research question, “*What is the end user value proposition and innovation position of the Literate AS tool kit for testing learning disabilities and dyslexia?*” from a technical study position. Using the innovation map model, this chapter analysed Literate AS' user utilities in relation to the key building blocks on the map i.e functions, design, and structural control. The main user utilities identified confirmed that the

tool kit will enable users to produce, comprehensive, reliable, credible and authentic results in real time assessments. The Literate AS tool kit was compared to other products on the market in order to distinguish its uniqueness. The results of the comparison showed that the Literate AS tool kit was the only digital tool kit for sale that also offered consultancy on socio-psychological evaluation. These analyses were used to come up with the following end user value proposition; *“Literate AS offers a comprehensive, holistic and reliable overview of an individual’s learning disorders by testing for reading, writing, comprehension disabilities and dyslexia in youths and adults.”*

The sub-research question of the chapter objective was answered by analysing whether the Literate AS tool kit is characterised as a radical or incremental innovation and whether or not the technology can be classified as disruptive or sustaining. The main distinguishing factor was that the Literate AS’ innovation was designed from an already existing methodology guideline for validated screening tool kit and that it was only improving the value offered by current market products. The tool kit lacked novelty and was not targeting new market niches. For that reason, this study concluded that the Literate AS tool kit was an incremental innovation with a sustaining impact on the market. Therefore, both implications identified in this study should be taken into consideration as I decide on the marketing strategy. Most importantly, as this analysis has established, the market niche to be selected in the market segmentation should complement the attributes of the Literate As’ type of innovation.

3. Market Study

3.1 Introduction

Planning is everything; planning is what makes or breaks a business venture. Careful planning enables a firm to speak in a clear voice in the market place so that customers understand what the firm is and what it has to offer that competitors don't- especially as it decides how to create value for customers, shareholders, employees and society, Aambroe (2013:50).

Planning presents a roadmap to identifying the market needs and how the invention intends to solve the pain. These are essential elements for Literate AS it charts its way into the market place. This chapter seeks to *evaluate Literate AS product's market opportunity and formulate the market strategy that compliments the product's sustainable competitive advantage.*

Literate AS is a start-up company registered in Tromsø, Norway since March 2016 and specialises in developing screening and diagnostics test kits for assessing people with learning disabilities. The name of the company was derived from "Literate" a Latin word which means "The one who can read and spell"! The current product, a test kit for testing and diagnosing individuals for reading comprehensive disabilities and dyslexia was developed from researches and longitudinal studies in learning disabilities and dyslexia. The research and studies were funded by the University of Tromsø and the product licence is wholly owned by the University.

The market analysis includes an overview of the Norwegian learning disabilities market, analyses the competitive products and on the market industry trends. Primary data from interviews with relevant stakeholders is used to assess the customer's unmet needs and motivations. Through a PESTEL, Porter's Five Forces and the SWOT analysis internal and external factors are identified. Obtained information was used to identify the key target market, the specific customer as well as to design the market entry strategy for the product launch. Information obtained will also be used to inform the company's business plan to be presented in the next chapter.

3.2 The Innovation's Impact on the Market

It has been established in the previous chapter that the innovation that Literate AS is bringing to the market is an incremental innovation with sustaining market implications. The

implications for this to Literate AS is that the market it is venturing into is highly competitive with already existing players; players that have an established clientele and a known brand. Therefore, if Literate AS is to get a share of the market as a sustaining innovation, the product has to appeal to target demanding, high end customers by offering services that have a better performance than what is currently available on the market, (Christen and Raynor, 2003). Most importantly, Literate AS has to target a customer that will help it establish legitimacy for future market sustenance, customers that have a reputation for excellence.

That said, the Norwegian socio, economic and political overview indicates a need for improved processes of testing, diagnosing, evaluating and assessing cases of learning disabilities. Such an invention should enable the government to address critical issues that are linked to learning disabilities. These are; an ever increasing number of students who drop out of high school and an increased number of unemployment benefit social support claims. New studies have also indicated that the propensity to commit violence and suicide due to frustrations attributed to lack of fulfilment and self-sufficiency is also quite significant in people with learning disabilities Bjærgen et. Al (2016). This market need indicates that the primary customer for Literate AS that will help the company establish its brand faster in a growing market, overcome legitimacy issues and be recommended as a reputable brand are buyers in the public services sector.

This sector has strict tender processes. Therefore, Literate AS' product is developed by Plus Point a reputable company that has worked with Nordlys and Master Diamond Cutter among other customers. Literate AS has conducted its product pilot testing at organisations like NAV, Tromsprodukt AS and PPT Nordland. These aspects of Literate AS innovation production process are instrumental in building its brand and credibility as a new market player. In addition to this, although there are other established market players, Literate AS enters the market as the only product that is more comprehensive with results that can indicate an individuals' specific special needs. The kit which will be available in Norwegian and Sami languages and in digital format, takes less time to administer, provides results in real time and has a zero percent chance of human error in scoring the test. These are the major gaps in the market that Literate AS intends to address.

3.3 Market Analysis

Market analysis is defined as a systematic collection, analysis and interpretation of information to make it easier to appropriate decisions regarding the marketing of a product, Lund (2014:17). This definition provided a radar for defining the target market, identifying the market opportunity, quantifying the needs of the customer segments, explaining the value proposition from Literate AS and analysing the internal and external forces that may threaten the company's position on the market. This section presents and discusses research that has been done on the international market and locally in Norway. The section also identified the target market, provided the market segmentation and market entry strategy.

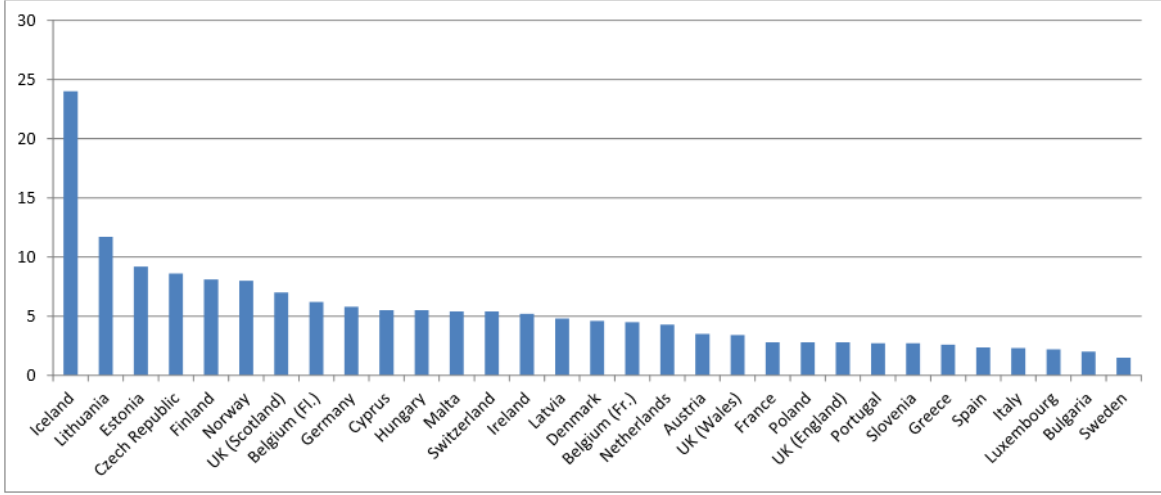
3.3.1 Industry Trends

Although there are international standard provisions, approaches to measuring learning disabilities vary across countries and influence the results and quantifying the size of the industry. However, the market for testing and diagnosing learning disabilities and dyslexia is a highly competitive one with minimal intellectual property rights protection options available for innovations in this sector. Any start-up venture in this industry must have a strong business idea with a strategic competitive advantage that can survive the fast pace at which new products are brought onto the market.

The Global Scenario

Globally welfare dependence and low work participation among individuals with learning disabilities has been on the increase. Available statistics indicate that approximately 800 million young children worldwide are affected by biological, environmental and psychosocial conditions that can limit their cognitive development leading to learning disabilities, (EU Employment, Social Affairs and Inclusion Report, 2013). The report further states that, in Europe, recent estimates place the number of children with special educational needs (SEN) at 15 million while conservative estimates state that dyslexia, a learning disability that impedes a person's ability to read, affects approximately 6 percent of Europe's population. The report also confirms previous assumptions that children with learning disabilities frequently leave school with few qualifications and are much more likely to become unemployed or

economically inactive. The challenges trickle down to the domestic setting as families of children with learning disabilities experience high levels of stress if they are not adequately supported. As shown in fig. 1 below, as of 2010 Iceland had the highest percentage of children undertaking special needs education while Norway was at number 6.



Source: EADSNE Country Data 2010 (cited in NESSE, 2012). Note: The statistics for Bulgaria and Italy are drawn from EADSNE Country Data 2008, since they are not included in the 2010 publication.

Figure 6: Country data on special education

The above trends are indicative of increased awareness in special needs education and how the respective countries are taking initiatives that guarantee equal opportunities for all. It is also crucial to highlight that special education has always been viewed as expensive and therefore seen as a luxury activity by the buyer. On the other hand, the end user, the individual with learning disorders has been left carrying the burden of stigmatisation, societal irrelevance and being regarded as “stupid” and not intelligent. The challenge is even deeper for developing countries who are in most cases still struggling to provide mainstream education for all and cannot afford social services support at a later stage when these individuals are adults and without employment. For this reason, few studies have focused on quantifying learning disabilities in developing countries. Available information points on disabilities on the whole, i.e. including physical disabilities hence the need to explore this market and begin with carrying out normative studies.

The Norwegian Context

Traditionally, the Norwegian economy depended on the fishing industry, shipping and agriculture; sectors that did not require highly skilled competences. A change in the Norwegian economic trajectory in the early 1970s when Norway became an oil producing nation has seen the Norwegian government focusing on other ways of boosting its revenue base. Of special interest is the need for Norway to invest more in human capital and encouraging entrepreneurial initiatives. Addressing a conference at UiT in September 2015, the Deputy Minister of the Norwegian Ministry of Trade, Industry & Fisheries, Dilek Ayhan, reiterated the Norwegian government's willingness to invest in its future, particularly its human capital. The changes in the government's fortunes implies that Norway can now afford to use a lot of resources on its school system including special needs education.

However, figures from the Norwegian Labour and Welfare Administration (NAV) and individuals' dependence on the social support system indicates a challenge to the government's willingness to invest in its human capital. Since 2008 there has been an increase in the number of high school drop outs and dependence on the NAV social services support. This trend is troubling to the Norwegian government, a concern highlighted by the government in its report to the United Nations Summit on Sustainable Development in July 2016. According to NAV, 3 out of 10 people do not complete upper secondary school. NAV's projections also indicate that the surplus of labour without upper secondary qualifications could number almost 150,000 individuals in 2030. Further researches on the Norwegian job market has indicated that quite a number of people who depend on NAV have learning disabilities.

According to the Norwegian dyslexia union, 20% of the Norwegian population have reading or writing difficulties, with 25-50% of these being dyslexic. According to statistics available from 2008, 40% of these individuals are listed as job seekers, 50% receive public insurance money and 53% stay at home, see Fig. 7 below.

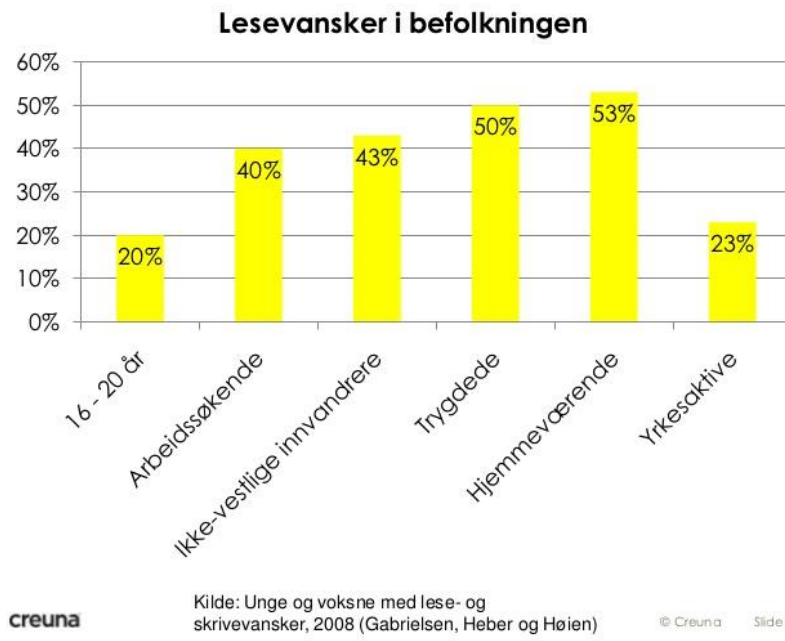
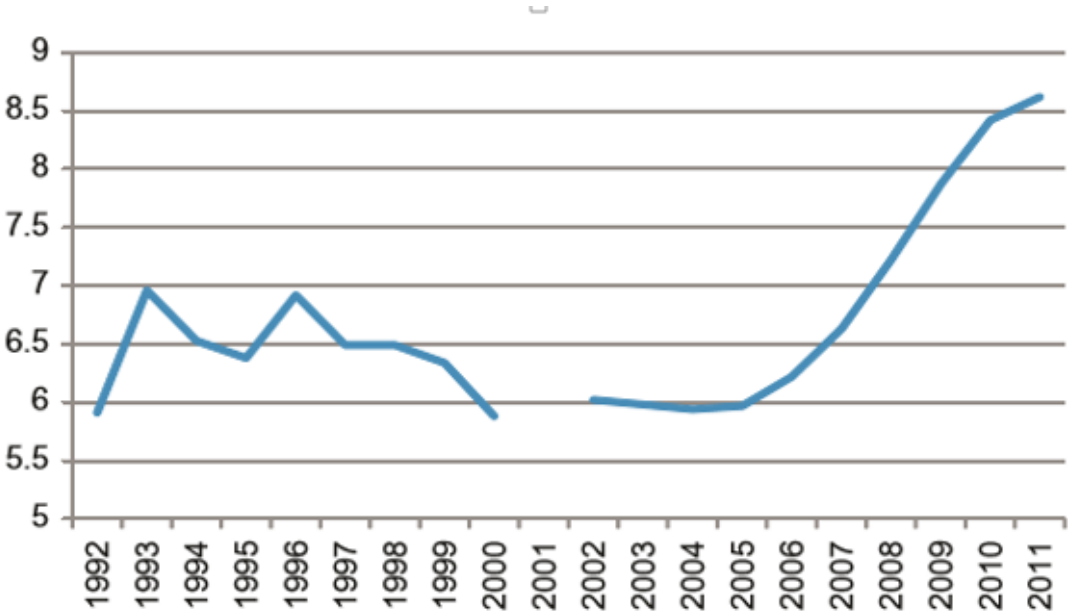


Figure 7: Statistics on Youths and Adults with Learning Disabilities

Dyslexics, like many other people with learning disabilities, do not imply that these individuals are “stupid” and not “useful” to society, but rather have strengths in reasoning and problem solving skills as well as visual - spatial and motor skills necessary to excel if given the necessary support. The above statistics are only indicative of how big the problem is since learning disabilities are not limited to dyslexia. Dyslexics only constitute a fraction of the total population with learning disabilities, hence the need to find a better solution to help curb the situation.

Norway has an equally inclusive stance on education which is not about merely integrating students in mainstream education, but about transformation of teaching so that it supports all learners. Section 5 (1) of the Norwegian Education Law emphasizes that students that do not benefit from mainstream education have the right to special education. However, before the decision to recommend special education for an individual is made, an expert assessment is done to evaluate the student’s specific needs. The Norwegian education system emphasises that a student’s learning problem must be recognized interactively that is, as a condition caused by an interplay between individual-specific and environmentally determined factors. Thus, ‘Learning disabilities’ is not formally recognized as a distinct disability as such or a

special needs category, (Thygensen, 2010). Such an assessment exercise requires a comprehensive tool kit that will provide a holistic overview of the individual’s learner needs for remedial services to be appropriately recommended. Currently schools are using STATPED, a National Support System for Special Education assessment tool that suggests whether the student needs special education, and what kind of tuition should be provided. Continuous reviews on special education policy has seen an upward trend on individuals seeking and accessing special needs education in Norway as illustrated below.



1. Amount of Special Education in Norway Grades 1–10. Source: GSI Norway (2013).

Figure 8: Illustration of trends in individuals seeking and accessing special needs education (Grades 1-10)

Furthermore, socio, political and economic instabilities across the globe has also caused an upsurge in the number of people arriving in Norway as refugees and asylum seekers. Emotional, physical and psychological distress in these individuals has an impact on their performance in school and in the work place implying an increase as well on statistics of people on social support benefits. According to the Economic Analysis Norway Report No. 32:2016, on average quantified factors amount to about 3.8 million NOK in 2015 prices per child if refugees and asylum seekers do not receive adequate primary and secondary

education. A market survey conducted among immigrants at Voksenopplæring Tromsø confirmed that a significant number of immigrants found it difficult to progress at the average pace at work and in schools due to challenges linked to learning disabilities. For example, after attending the Norwegian language courses their oral competences were good enough to get them into the workplace but they would be frustrated with tasks that required writing skills in Norwegian.

NAV is a governmental organisation responsible for providing public insurance funds, day care funds and unemployment benefits among other functions. NAV's willingness to address issues of learning disabilities can equally be explained as the government's position in alleviating the plight of its citizenry. According to Powel and Richardson, special education in Norway is not always about the wish to help people with problems; special education strategies can also be viewed as national strategies to secure the international position of the nation, (Hausstatter and Thuen 2014). Special needs education is also part of the government's international policy strategies. The issue was reported as one of the nation's major challenges and Norway is part to the UNESCO Salamanca Agreement 1994. This notion is further supported by the Norwegian government's position to reinforce its fiscal policy efforts by earmarking NOK 4 billion for specific measures to increase employment with a strong focus on investment in infrastructure, *employment*, restructuring, *research and innovation*, (The National Budget 2016). It is from this perspective that NAV is looking at cooperating with other sectors in education, health, municipal services, and local employers in integrating and rehabilitating people that are currently out of work for various reasons and depending on the social support system. From the above description, a sizeable number of these people may be suffering from learning disabilities that limits their ability to execute their tasks efficiently.

All these are indicative of a growing market for social innovations like the Literate AS test kit for learning disabilities. Data gathered in this section was crucial in providing key information on potential target customers. Stakeholders in the market that are responsible for strategic decision making in buying services for learning disabilities and dyslexia testing and diagnosis. A range of potential target customers were identified for the customer analysis section to be discussed below.

3.4 Literate AS' offer

Literate AS offers a testing and diagnosis kit that can determine and detect various aspects of learning difficulties in both youths and adults, target age group for the current product is 15-65 years old and development processes for the next product that will serve the 5-10 years old age group are underway. The test kit is a group test kit that can also be taken individually on individuals who would perform poorly. While the test kit on its own is not the complete solution to the challenge of school drop outs and dependence on the social welfare system, it is designed to bring to the surface the underlying disabilities that may cause frustrations in individuals with learning disabilities. Once these specific challenges are established, these individuals will be given a chance to seek remedies available that may help them to perform better. It may be useful to illustrate the application of the test using a real world case. Take for example *Kristian who has been on NAV benefits for 12 months gets a job in a warehouse through Tromsprodukt AS but has problems in meeting targets and following the warehouse cataloguing system. The screening test kit was used to test his reading and writing skills. From the results it was proven that he could not read and write. Even though he could lift and pack goods, he needed basic skills to deliver both as an individual and within a team. Skills like being able to read the warehouse cataloguing system so that he could easily know where to pick or pack goods. Having established his reading and writing challenges, Literate AS then recommended that the Kristian could use the audio scanning pen and still work better in his new position. This ensures job satisfaction and reduces the chances of this individual from quitting his job and going back to depend on NAV benefits.*

The products and services offered in the product package are systematically linked to maximise Literate AS' market position. The test which was originally in the pen and paper format will be available in digital format, a decision taken in order to maximise the benefits of the minimal IPR protection options available in the industry. Literate AS will also provide competency and consultancy services in training, advising and interpreting the test results to the test administrators. The scoring will be automatic in the program.

Even though Literate AS offers a more holistic approach to screening and testing of learning disabilities, the interest to the methodology field is not high enough to be protected from being copied by competitors. According to the Norwegian Patents Act (1967), neither the methodology for the test, nor the computer program for the digital version is patentable, due

to the lack of “a technical solution” in the product. Therefore, the only Intellectual Property Rights protected by Literate AS shall be the trademark of the company name and its logo, copyrights on the handbook of instructions and non-disclosure agreements on the code for accessing the tool kit from the cloud server.

3.5 Customer Analysis

In general terms, a customer is anyone who buys goods and services produced by a business. A customer can be an individual or a business entity buying from another business. So the essence of embarking on any business initiative, entrepreneurial or otherwise is to serve this individual or business, whose need or pain you intend to address and if you are going to add value to their lives then as a service provider it is critical to know the customer intimately. As stated by Bjærgen et. al (2016), persons with intellectual disabilities or learning difficulties may experience challenges in daily life, including more formal situations like seeing a doctor, understanding official letters or understanding their role in society. Individuals with learning disabilities may be at a greater risk of experiencing difficult situations, being victims of crimes and experiencing abuse, as well as also being at risk of committing crimes. One study showed that 10.8% of persons in prison, had an IQ lower than 70, Bjørgen et.al. (2016). This submission as confirmed in the market analysis highlights the fact the learning disabilities are multi-dimensional and Literate AS’ customers ranged from individuals or institutions that interacted with people with learning disabilities to domestic users who interacted with these people on a daily basis.

Unmet Needs and Motivations

Through this market analysis, Literate AS sought to establish who the customer is, what they buy, how they are currently buying the service, why they were buying and what were their unmet needs? During the empathy phase of this study, a stakeholder mapping exercise was carried out. The objective was to identify the people that were interested in testing and diagnosing for learning disabilities and dyslexia and the impact of their influence on the success of the product on the market. The stakeholder influence parameters were Influence/ Power of the stakeholder in the product vs. the Interest of the Stakeholder in the product. This exercise established two types of customers to be analysed, the **buying customer** and the **end user**. These two customers are further divided into two categories, i.e. the private consumers who buy for personal and or household use and the organisational buyer who buys on behalf

of the end user as is the case with institutions like NAV, Tromsprodukt AS, public schools to mention but a few. The market on learning disabilities screening and test kit has a variety of customers who choose to screen and test for learning disabilities for an array of reasons as listed below.



Figure 9: Potential Customers for Literate AS

The empathy process was the first step in intelligence gathering in determining the real customers unmet needs and motivations from the assumptions. Primary data collected through interviews showed that the buying customer was motivated by the need to have a tool kit that would be comprehensive enough to determine the underlying causes for the high numbers in students that withdraw from studies, why some individuals performed poorly in other tasks at the work place as well as the increase in the number of individuals on social services support

through NAV. An interview with instructors from Traffikskolesentre was useful in providing information that the assumption that driving schools were potential customers was not valid. According to this respondent, driving schools test learners on the practical driving ability. Even though there were theory exercises, they were not graded and all a learner needed to pass the stage was to attend the theory sessions. Therefore, such information was useful in selecting Literate AS' target customer.

Interviews conducted at NAV confirmed that this organisation had a high influence in buying services for the public sector and controlled a bigger budget that if they were to enter into a contract with Literate AS it would provide a sustainable market share. An official at NAV confirmed that the organisation was currently using a tool Kit from the Fagboklager which is based on the national curriculum for their Vocational Occupational Rehabilitation project at Tromsprodukt AS. NAV was unimpressed with reports from Tromsprodukt AS and were motivated to try something else. Literate AS's prototype is available and after pilot testing at Tromsprodukt AS, the customer was happy and ready to buy Literate AS' product. Another interview at PPT Nordland echoed the same sentiments as highlighted at NAV although they used a different product Logos. Information gathered established that customers were not happy with test kits that were time consuming, lacking in comprehensiveness and not technologically compliant. At PPT Nordland the customer expressed sentiments that the industry needed a secure testing tool kit that had increased data protection services and a secure and reliable back up system of results for future use.

Individuals interviewed mostly parents to kids with learning disabilities felt that if they could get a tool kit that would tell their children's challenges in details and give a clear indication on their exact shortcomings it would be easier for them to communicate with the schools on how best they can help their children perform better at tasks. Such feedback on customer unmet needs and motivations were instrumental in Literate AS's decision to drop the traditional pen and paper version of the tool kit and opting for the digital version. Customers reported that the pen and paper version increased chances of imitability. Another major take away from this exercise was that with the pen and paper version, the test administrator was responsible for scoring the test manually which increased chances of human error. What they wanted as customers was a service that would automatically score the test in real time. Market prices were almost similar across the board so respondents were happy to pay any price within the market rates.

3.6 Competitor Analysis

All competitors are relevant to strategy development as they inform the trajectory of an organisation's performance, image and personality, objectives, current and past strategy, culture, cost structure, strengths and weaknesses. Acknowledging current and potential competition in any business is important in developing a business strategy. However, identifying such threats is particularly problematic, since competitive threats may arise from substitutability on the supply side as well as on the demand side (Bergen and Peteraf 2002). Conducting a competitor analysis therefore, facilitates an assessment of strategic opportunities and threats that various competitors represent. Managers will then be able to prepare and provide solutions to potential threats as well as strategic moves that sustain the organisation's competitive advantage.

In this study I identified two key competition parameters on the market for Literate AS. There are the competing products i.e. the products already on the market, and the competing companies that have been providing screening kits before Literate AS' product. Information on competitors was gathered through secondary data from online publications, annual reports, newspaper articles reviews and through interviews during the market research phase. Specific company information on competitors on their costs structures, income and expenditure was obtained from Proff- the Business Finder (www.proff.no). The essence of this exercise was to gather knowledge on the competitor's operations i.e. what products they offered, pricing strategies, finances, their current market position and possible future market expansion strategies.

3.6.1 Competing Products

Most of the test kits currently available test reading skills in English, Norwegian and Maths. They test on Reading, spelling and vocabulary which is basically the same tests included in Literate AS. However, Literate AS goes deeper and measures phonological skills. A core skill and a core obstacle for students with learning disabilities. Reading test do not tell why one has poor reading skills for example, is it something circumstantial due to tiredness, bi-lingual, or are they a new language learner, lack of practice etc. Testing of cognitive skills which indicate on phonological skills takes on a holistic approach on the underlying cognitive skills that lack

in an individual. These tests are used together to evaluate the extent of one’s disability and provides a basis for further testing and remedial assessments.

According to information obtained, products available on the market serve two critical aspects on testing for learning disabilities and these are i) pre-screening test and ii) diagnostic test. Pre-screening tests are the basic elementary test conducted on an individual’s literacy level and these are used to determine if the individual would require further examination which leads to the diagnostic test. Screening test are not as intensive as diagnostic tests and usually require less time to conduct, they also do not require the services of a professional in conducting the test. Their main function is to assess an individual’s decoding and comprehension abilities. There are many of such tests in Norway, among them are Kartleggeren, Setningsleseprøve (Logos), Ordkjedetesten (Logos), Carlsten Testen, Språk 6-16, Standardisert Test 1 Avkodning og Staving (STAS) and UDIR’s own test. It should be noted that these shortlisted products serve the same target age group as Literate AS. The key strategic competitive advantages of each of these is illustrated in the table below. This was used as a yard stick in determining Literate AS’ competitive advantage.

| Column 1 | Literate AS | Kartleggeren | Carlsten-Testen | Ordkjedetesten | Setningsleseprøve | Språk 6-16 | SDI | STAS | UDIR's Test Kit | Logos |
|---|-------------|--------------|-----------------|----------------|-------------------|------------|-----|------|-----------------|-------|
| Pen & Paper | x | | x | x | x | x | x | x | x | x |
| Digital (No distribution of free copies) | (x) | x | | | | | x | | x | |
| Group Testing | x | x | x | x | x | | x | x | x | x |
| Individual Testing | x | | | | | x | x | x | | |
| Primary School Grade 1-7 | | x | x | x | x | x | x | x | | |
| Secondary School Grade 8-10 | | x | x | x | x | x | x | x | | x |
| Upper Secondary School | x | x | x | | | | | x | x | x |
| University + Adults | x | | | x | | | | x | x | x |
| Generates Report and Work Plan for Referr | | x | | | | | x | | | |
| Digital System with previous results | | | | | | | x | | | |
| Administration Time Frame | x | x | | | | | x | | | x |
| Personal support and monitoring | | | | | | | | | | |
| Screening & Diagnostics | x | | | | | | | | | x |

Figure 10: Overview on Competing Companies

Also see attached Appendix 10 on competitor profiles.

3.6.2 Competing Companies

From the above analysis, Logos, Kartleggeren and SOL presents a strong competition for Literate AS compared to the rest of the market players. These three focus their service on the same target group as Literate AS. Kartleggeren considers itself the market leaders and their test kits focus on the individuals' performance in English, Norwegian and Maths and covers most of the customer sectors. Kartleggeren also has an online test available thus consolidating their strength on the market as an established brand. While this is a threat to Literate AS, the Kartleggeren test is only available as a group test, whereas the Literate AS can be taken both on groups and as individuals.

Logos from Logometrica is the only company that offers screening and diagnostic tests and is adapted for both kids and adults which is in direct competition with Literate AS. Logos is currently used in public and private schools, universities, vocational schools, NAV, Pedagogisk- Psykologisk Tjenester/ Educational Psychological Services (PPT), Barne og Ungdomspsykiatrisk Poliklinik / Clinic for Child and Adolescence Psychiatry (BUP) AVIGO, prisons and hospitals. Another competitor that is closely in competition with Literate AS is SOL, nonetheless, this competitor operates in the Gjesdal commune. The market survey also established that the Department of Education (UDIR) intends to introduce their own test kit for screening students with learning disabilities in line with the government's position on inclusive education. However, Literate AS' product description and packaging significantly aligns with what the UDIR is seeking. This may imply that if successful in bidding for the department's 2018/2019 tender, Literate AS would succeed in eliminating this competitor and have them as a partner on the market.

While there are no major disparities in product's strength, Literates market position may be compromised by limited resources compared to other key competitors. For example, Kartleggeren, one of the major competitors belongs to Fagbokforlaget which has the biggest portfolio in the education sector but generates revenue from offering interactive Norwegian web-courses, pedagogical software, governmental publications and publishing school books. With a diverse resource base, Kartleggeren only accounts for a fraction of the company's income. Fagbokfarlaget has established its brand name and has the financial clout to continuously upgrade their product portfolio to match new offering on the market. Therefore, Literate AS would assume that if NAV would send feedback to Kartleggeren indicating that

their product was not fulfilling their needs, chances are they are probably working on an upgraded version of their product. As a service provider known to NAV, this presents a huge threat to Literate AS.

Other major players are Cappel-Damm, the owners of Carlsten-Testen and Statped, the owners of Språk 6-16. These are big well established companies with a wider revenue base and established networks in the industry. Unlike Literate AS that is dependent on subsidy grants for product development, these competitors have funds to produce newer products once they realise that their customer base is threatened by a new player. As such, Literate AS has to adopt a strategy that significantly protects its methodology, product design and increase its value proposition on the market.

3.7 Environmental Analysis

Learning difficulties, sometimes referred to as intellectual disabilities is a condition that includes the presence of a significantly reduced ability to understand new or complex information, to learn new skills (impaired intelligence) with reduced ability to cope independently (impaired social functioning which started before adulthood, with lasting effects on development), (Emmerson & Heslop 2010). Individuals with this condition may also have physical and or sensory impairments, mental health problems or other “neurodevelopmental disorders” such as autism that may affect their performance at work or in school. Therefore, the industry around learning disabilities detection is mainly about the use of different operative tools in screening individuals for any learning disabilities. Such operative tools do not solve the problem of learning disabilities but are designed to bring these disabilities into the open. Once identified, the affected individuals may find ways of reducing the implications later in life by providing guidance and follow ups on an individuals’ progress on their performance in school or at work.

While screening tests are already done in comprehensive schools, the focus is more towards the younger age groups and kindergartens, prisons and other private institutions. The tests are run either individually or in groups depending on the objective of the test. In this research I have also established that information on an individual’s learning disabilities status does not follow them through the system. However, it is also crucial to highlight that most studies work on learning disabilities or related studies outside the school environment have resorted

to using translated versions of Learning Disabilities Screening Questionnaires of test kit. A study conducted by Bjørgen et.al (2016) used the translated version of the UK developed Learning Disabilities Screening Questionnaire. While another research conducted by Green et.al. (2009) on Dyslexia screening and testing in Oslo used the translated version of the Swedish Duvan screening test kit. A survey in the industry has also shown that there is no screening and test kit on learning disabilities available in the Sami language, another Norwegian official language. All these shortcomings are an indication for the need for a more holistic, professionally modelled screening test kit that can be used for official learning disabilities screening functions.

This is a fast paced industry that has few stringent regulations on what comes on the market, as such, new screening test kits and other helping tools are brought to the market frequently. Although there are regulations on using and storing personal data, screening and testing methods are not patentable in Norway which makes it highly difficult for operators to gain competitive advantage and maintain it based on intellectual property rights. Most importantly, competitive advantage in this industry can be attained by developing a pain solving, holistic test kit and not a nice to have functional test kit.

Since 2002 there has been a marked increase in the number of children receiving special education support to which the government has responded by providing a national grant supporting special needs education research, Haussatter and Thuen (2014:205). The government has also adopted a national strategy, Språkløyper Nasjonal Strategy for Språk, Lesing og Skrivning (2016-2019), a move that provides an indication to the growing interest in the sector. All these developments create an impact to the industry and define how it will develop in the near future. Notably is the fact that the market is expanding and every improvement for literacy disorders screening and testing is taken seriously. For a detailed analysis of the industry and what it has to offer a macro to micro industry analysis was carried out. Presented below are findings from the PESTEL Analysis, Porter's Five Forces Analysis and the SWOT Analysis.

3.7.1 PESTEL Analysis

The PESTEL Analysis is vital when identifying key factors in the macro-environment because they provide a road map on understanding the industry in the SWOT Analysis. This

analysis is crucial for Literate AS in evaluating its market potential because successful identification of future macro-economic variables of interest necessitates the constructions of different scenarios that would place the company in a better position to make strategic decisions needed to ensure the proper development and sustainability of the business. From all indications as presented in the PESTEL Analysis table below, key macro-environment determinants are in favour of Literate AS’s venture. Most importantly is the government’s support for inclusive education with a strong focus in literacy disorders, the rehabilitative and integrative approach to the unemployed and support for research and entrepreneurial start-ups. Economically, the test is affordable for both individuals and organisations.

| | |
|--|---|
| <p>POLITICAL FACTORS</p> <ul style="list-style-type: none"> • The Norwegian Government is committed to integrating special education • Government can propose regulations on rehabilitation, integration and empowerment • Available funds for research and entrepreneurial initiatives from the government • European Community (European Dyslexia Association, agreement for all European Countries about Dyslexia) | <p>ECONOMIC FACTORS</p> <ul style="list-style-type: none"> • Increased unemployment rates and dependence on social support • Interest by individuals to pay for their own test • Affordable pricing model for both individuals and corporates • Increased interests in special needs education • Cuts in Public Services due to the drop in oil prices • Lesesentret and SNOKivesenteret are developing free ready to use competence packages to deal with dyslexia under Språkløper strategy (Norwegian Centre for ICT education) |
| <p>SOCIAL FACTORS</p> <ul style="list-style-type: none"> • High numbers of school drop outs • Increased focus on literacy disorders in the last decade • Janteloven Mentality • Younger generation is more technological savvy thus encouraging swift information flow • Self- harming and suicides associated with learning disabilities has increased by 12% • Learning disabilities are multifaceted | <p>TECHNOLOGICAL FACTORS</p> <ul style="list-style-type: none"> • Fast paced digital world • Creating a domain name and website • Easy access to computers and internet • Increased focus on digitalised pedagogical assistance • More digitalised learning tools in schools • Assistive technology which helps people with learning disabilities to cope with work load and tasks. |

| | |
|--|--|
| <p>and cannot be treated under one blanket solution.</p> <ul style="list-style-type: none"> • Acceptance of individuals with learning disabilities as functional individuals requiring special assistance • Support groups for people with learning disabilities | <ul style="list-style-type: none"> • Technological advancement in diagnosing dyslexia and other learning disabilities • In Norway, computer literacy is part of the national curriculum as a basic skill. • Various teaching methods that are mentally stimulating and engaging • Technological breakthrough confirmed some learning disabilities like dyslexia are genetic. |
| <p>LEGAL FACTORS</p> <ul style="list-style-type: none"> • Methodology cannot be patented • Laws on data protection and individuals' privacy • Costs for IPR protection • National Education Policy • Legislature on inclusive education, Section 5 (1) Norwegian Education Law • Equality in Education • Equal Opportunities at work | <p>ENVIRONMENTAL FACTORS</p> <ul style="list-style-type: none"> • Paperless offices trends, less printing and strong focus on Green Certificates • Virtual Environment • Inclusive education |

Table 4: PESTEL Analysis

3.7.2 PORTER'S FIVE FORCES

The Porter's Five Forces model considers five forces that determine the attractiveness of a market by analysing the competitive intensity, i.e. the overall industry's profitability assessed by looking at the potential opportunities and risks (Porter and Kramer, 2006). The model uses five key points to identify and evaluate potential opportunities and risks and these are competitive rivalry, threat of new entrants, threats of substitutes, bargaining power of suppliers and the bargaining power of customers. This model is highly relevant to this study because it looks at the forces that market actors can exert on their target market and how this could affect the organisation's product positioning and long term success.

On the overall, rivalry within the industry is comparatively high and is also compounded by the threats of substitute products. Threats of new entry can raise the level of competition in an industry, thereby reducing its attractiveness (Jobber, 2007). These can in turn be moderated by barriers to entry i.e. higher entry barriers provides a vanguard to high number of new market entrants. In the case of Literate AS, the methodology behind the test can be reverse-engineered and thus copied by competitors who already have a monopoly on the market. There exist two products on the market that have a monopoly on the bigger chunk of the market share and these are Logos and Kartleggeren. These two also have major customers in the public services but Literate AS will focus on NAV and its affiliate organisations like Tromsprodukt AS, Arbeidsrådgivningskontoret (ARK) and upper secondary schools as its target customers. The threat of new entry is high because the ICT industry is moving at a fast pace and new products are easily developed and brought into the market. Literate AS also depends on subsidy grants for product development a scenario that may see competitor's with strong revenue bases developing and launching better products before Literate AS. All these factors show that even though Literate AS has developed a competitive product, the industry it is venturing into is highly volatile and requires that the company business strategy be well thought.

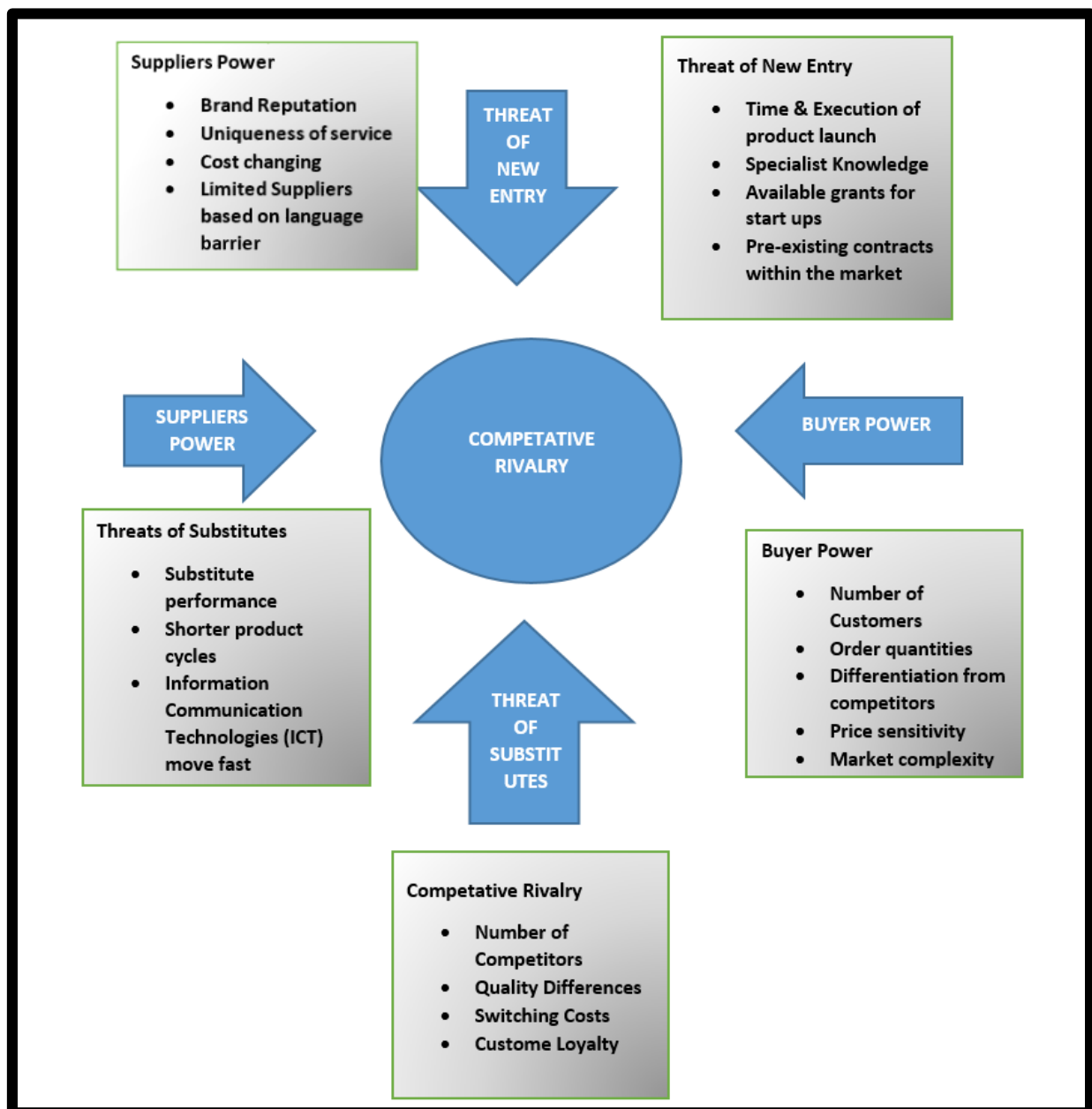


Figure 11: Porter's Five Forces Analysis

According to Porter's model, the middle block comprises of forces operating in the same way within the market and are considered to be the horizontal competition (Team F.M.E, 2013). The remaining forces which are in the vertical competition operate within the supply chain. The five forces analysis is mostly used by organisations when making qualitative evaluations of their strategic position at the start of the development or review process. According to this model, it is important to understand competitor's actions and marketing strategy. The larger

the number of organisations involved in the market the greater the level of rivalry because organisations have more competition when trying to win customers' and buying resources, so rivalry can be quite aggressive. This is the case in the literacy disorders screening industry.

Power of rivalry on the market is significantly high due to the low differentiation in the product. Although the two extra subtests in Literate AS' product makes it different from the rest on the market, it is not distinctive enough to buy in the interests of committed customers already engaged with other suppliers on the market. Most of the services rendered in this market are through tenders and contracts, meaning the companies currently operating in the market have already established contracts with clients. However, the current market does not have a tool kit in the Sami language which is one of Literate AS' product portfolios. Since the target customer offers nationwide services, having a SAMI tool kit increases Literate AS' chances of being the best alternative on the market as it will be a one stop shop. Notably, the current market is not too keen on digitalization, with few tests offering the digital version which gives Literate AS a competitive advantage. By providing services in digital forms, Literate AS increases its value proposition to the customer because the market is moving towards the concept of paperless offices. Therefore, the product is technologically compliant implying that it takes less time to administer and provides results in real time. Literate AS' pricing model is based on the social innovations principles of making a difference to society while at the same time set at a peg where it does not inadvertently limit the company's ability to invest in further research and development as well as operate at a profit.

Threats of substitutes are equally high due to the versatility of the test methodology. As highlighted earlier, the methodology behind the test can be easily used to create similar test within the same ambit of literacy disorders. Literate AS will circumvent this threat by having its customers sign a Non-Disclosure Agreement. The product will only be accessible from the cloud server using a username and password. Sales will be for group tests through organisations and schools. The product will not be sold to individual users as this will increase chances of the product being bought by competitors and be used for creating substitutes. Literate AS will also provide services to corporate customers and not individual buyers. This way the above IPR strategies will be effective as the organisation will be working with traceable, customers with a contractual obligation to fulfil.

The power of buyers is also high and poses a huge threat at Literate AS because the company is targeting three market leaders to sign renewable contracts which will be its source of income. If the buyers terminate the contracts or at worst chooses their old suppliers over Literate AS then there will be no sales for the company. This is mostly because most of the target customers work with a limited budget, hence price sensitivity. There is also the factor of product switching costs if they decide to move from their previous supplier to Literate AS. This is a yard stick in Literate AS' pricing model as low differentiated tests make it easy to switch suppliers.

Power of Suppliers is the lowest on the quadrant scale due to the direct relationship current test companies have with customers. Exchange of copies of tests and payments is done directly between the service provider and the customer based on already established relationships.

Threat of new entry is usually associated with internal economies of scale, patents and proprietary knowledge and asset specificity. Literate AS' market entry is threatened by pre-existing contracts in both the public and private sector as these are usually binding for a certain period of time. The Norwegian government is also encouraging entrepreneurial initiatives and there are grants available to support start-ups, funds that have also been accessed by Literate As. There is also the aspect of start-up costs which require a substantial investment towards the digital test kit.

3.7.3 SWOT Analysis

In the SWOT analysis below, Literate AS's Strengths and Weaknesses representing internal factors, as well as the Opportunities and Threats representing external factors are presented. This analysis is key in determining the advantages and risks of the company, its product and the market outlook.

| | |
|---|---|
| <p>STRENGTHS</p> <ul style="list-style-type: none"> • The only test on the market that does phonological testing • Offers a holistic approach to learning disability screening and diagnostic testing • The only test on the market that screens and do diagnostic testing of both learning disabilities and dyslexia • The test can be administered in groups or on individuals • Time saving, it takes only 45 minutes • High accuracy and sensitivity • Test can be made variable • Strong in-house competence • None Disclosure Agreements as a way of IPR Protection • Increased product credibility as an UiT Licenced product | <p>WEAKNESSES</p> <ul style="list-style-type: none"> • Limited funds • Lack of competence in business studies • The methodology cannot be patented according to the Norwegian Patents Act • The methodology can be reverse engineered. • High Costs for digitalization • Need for language expertise in order to translate the battery pack into Sami • New brand on the market |
| <p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Technologically compliant innovation • Support from Innovation Norway • High market demand • The concept of the entire battery pack can be translated into other languages • Low direct competition on the target market group i.e. NAV and its sub-agents. | <p>THREATS</p> <ul style="list-style-type: none"> • The Department of Education may introduce a similar product on the market • Test protection • Can be easily copied • One time user who may not need further remedial support • Strong competitors may improve on their products |

Figure 12: LiterateAS SWOT Analysis

3.8 Market Strategy

From the above presentation, Literate AS can only maximise its chances of survival in the market by choosing to serve a specific group of customers by forging strategic alliances. Gans et al (2003) posit that many technology entrepreneurs have secured extra ordinary returns by integrating their innovations into an existing value chain, often involving intimate co-operation with established industry players. This is the strategy Literate AS is adopting.

Literate AS chooses to work with the key market drivers so as to leverage existing value proposition.

The Literate AS learning disabilities and dyslexia testing and diagnosis tool kit is owned by UiT. Literate AS is licenced to commercialise the test kit and pays royalties to the UiT. The product will therefore be marketed as an UiT product and Literate AS has permission to use the UiT logo together with its own in selling and product and making investor pitches.

Strategic synergies have the value of reducing costs and investment while at the same increasing the network base and strategic connections. Literate AS has no brand tag on the market; it is a new player. Therefore, by identifying the product as belonging to the UiT Literate AS mitigates fears and doubts from target customers as they will be investing in a product from a reputable research credible institute. In addition, Literate AS has the advantage of creating tactical alliances that allows the company to offer “whole products” and penetrate customer strongholds that are currently occupied by its key competitors. This has the total effect of ensuring customer satisfaction as the product manager to be appointed will give undivided attention to the whole product, thereby giving Literate AS a chance to leverage its position in the existing systems and players. If Literate AS is successful in dominating this market niche, the customers and partners established here can facilitate the company’s entry into adjacent niches.

The market is diverse and may be tempting to have pockets of buyers which may be expensive on the limited resources of the company and may also make the product susceptible to imitation thereby reducing its market life quickly. Moore 2014: 116 raises 3 critical questions or scenarios essential in targeting the point of attack i.e. i) how does the new product enable the end user to go about the task efficiently, ii) what is it about the new approach that allows the end user to get unstuck and be productive, and lastly iii) what are the costs avoided or benefits gained? In relation to Literate AS, these have been illustrated as follows:

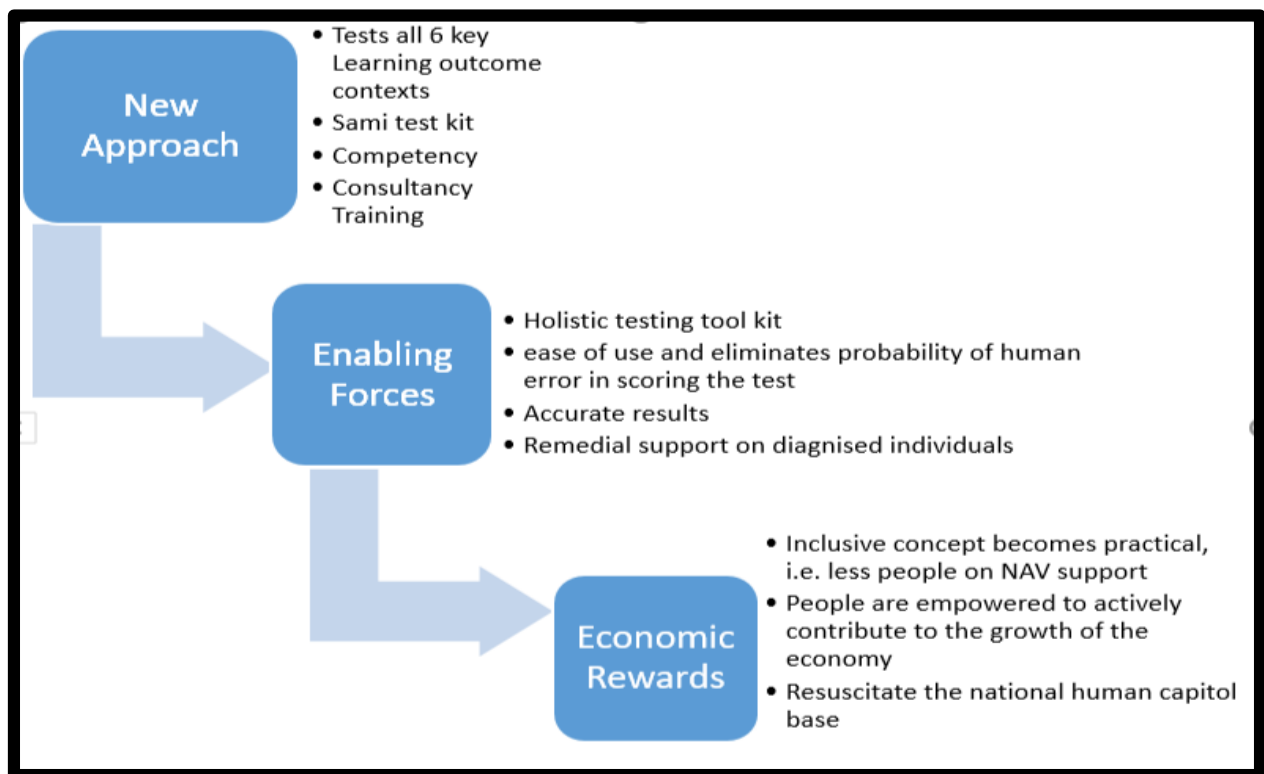


Figure 13: Literate AS Targeting Point of Attack

Therefore, NAV, PPT Ungskole og Videregående skole and the UDIR have been identified as the company's first customers at product launch. Literate AS' intends to sign its first contract with NAV at market entry. NAV has been identified as a catchment zone for individuals with learning disabilities. See illustration in Fig. 7 below.

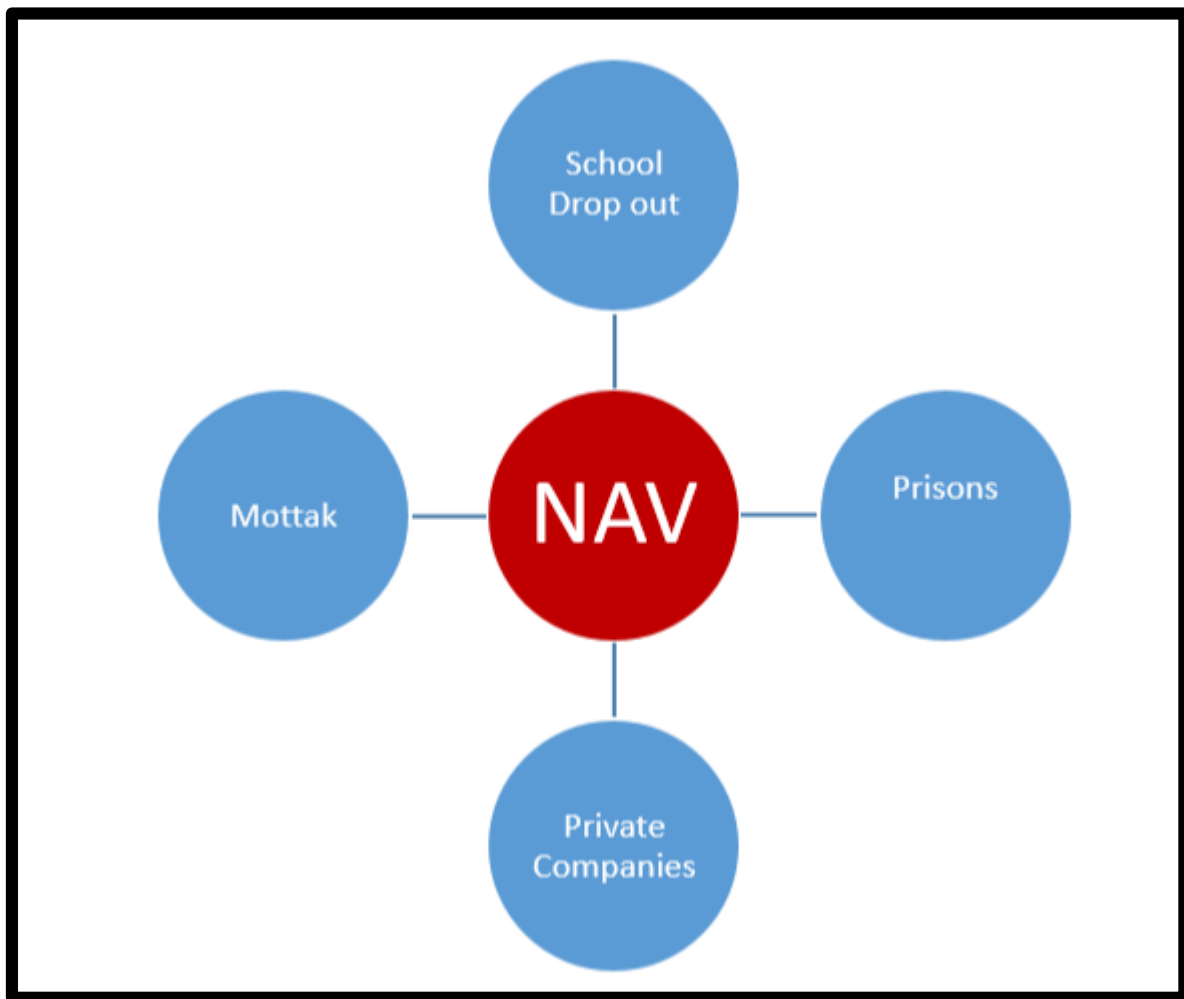


Figure 14: NAV as the target of Market Entry

In this business model, NAV is the catchment area for operations. NAV is in a strategic position in accessing different individuals in the sense that all the other customer segments feed into the NAV resource bank. It serves as a conduit to the product market. When individuals drop out of school, vocational training or universities they end up on NAV pay roll until they get a job. Those that are in prisons, on finishing serving their sentences, they also go on benefits until they are back on their feet. As mentioned earlier on, a fraction of those in prison or correctional services are individuals with learning disabilities who ended up committing crimes due to their frustrations. This was also confirmed by a prison official in one of the interviews during the market study. Private companies are also linked to NAV in that when individuals with learning disabilities fail to perform and be productive, they may

end up laying them off, thus adding onto the statistics of individuals on social support. Another critical group of customers are the refugees and asylum seekers who upon registering with Mottak and going through the process of integration will be on social services support.

Therefore, NAV is the point of convergence and commands a bigger share as the buyer in the market. Dealing with NAV directly allows Literate AS to streamline the company's resources in further product development and build a reputable brand and reference for other business tenders with organisations like the Department of Education. This is also in line with the fundamental principle of crossing the chasm which recommends that in order to get a specific niche market, as a point of attack, it is important to focus resources on achieving the dominant leadership position in that segment as quickly as possible, Moore (2013:105).

3.7.4 Intellectual Property Rights

A marketing strategy should establish a clear link between the organisation's products or services and its start up as the producer or provider of such products or services. Customers should be able to distinguish between your products and services and those of your associate them with certain desired qualities. Even though the business of testing and diagnosing learning disabilities and dyslexia lacks strict IPR regulations, Literate AS' tool kit has trademarks, copyrights protection and licences to protect its products on the market. As a new player in an industry that is flooded by big companies, Literate AS intends to use intellectual property as a key strategy for creating an image to its customers.

Trademarks will be used in marketing activities as a means of distinguishing the tool kit on the market. *Collective Marks*- the product is owned by the UiT and Literate AS is licenced to take it to the market. Literate AS will use the university logo together with its logo for all marketing and business transactions thereby allowing the company to benefit from the reputation of associating with a credible institution. This will also give the product credibility and authenticate it as a well-researched, quality and reliable product. These same attributes are crucial for negotiations with the company's target clientele. Industrial designs, domain name (www.literateas.no), Non-Disclosure Agreements (NDAs) with customers are some of the key IPR strategies Literate AS will use in order to enhance its image on the market. All these IPR options have been well researched with the legal counsel from Onsagers Patent

Office Tromsø. The NDAs are crucial in maintaining Literate AS' strategic competitive advantage in safeguarding the company's trade secrets on the product from unfair competition.

3.9 Choice of Business Model

In this chapter, Literate AS has identified NAV, Tromsprodukt, ARK and UDIR as its market niche. Literate AS will provide services in two forms that complement each other.

3.9.1 Product

The product package will consist of a digital version tool kit and Consultancy on administrator training and further assessments and remedial recommendations. The product is comprehensive, not time consuming to administer and eliminates chances of human error when scoring. Unlike other products on the market that are pen and paper based, Literate AS' will be available in digital format and will be sold to corporate buyers only, thereby, reducing chances of imitability. IPR options applicable to the product are more compatible with the digital version. The product will be accessed through a password secure system to protect the product from being shared for free. The digital version is also compliant to the concept of sustainable innovations that are convenient, economical, user friendly and environmental friendly. A one-day course training the test administrators on test administration and results interpretation will be offered. The founder and CEO has extensive knowledge in learning disabilities and has a robust network in higher and tertiary education sector and profession as a psychologist. These credentials are essential in building trust in the product and get the buyer's interest.

3.9.2 Positioning

Literate AS will provide screening and diagnostics testing for learning disabilities and dyslexia, training of test administrator and consultancy to its customers. These services are value adding to the needs of our customers in that they will create ease of use in assessment, they cover the two main languages in Norway, they have secure log in and access to the tests as well as secure back up on the Data Centre in Oslo. The product is technologically compliant and has high sensitivity in discriminatory power. All these attributes will guarantee

credible and authentic results without a probability of human error in scoring and interpreting results. To this end, initiatives like inclusive education and vocational occupational rehabilitation will realise results of empowering individuals. See Fig. 8 below.

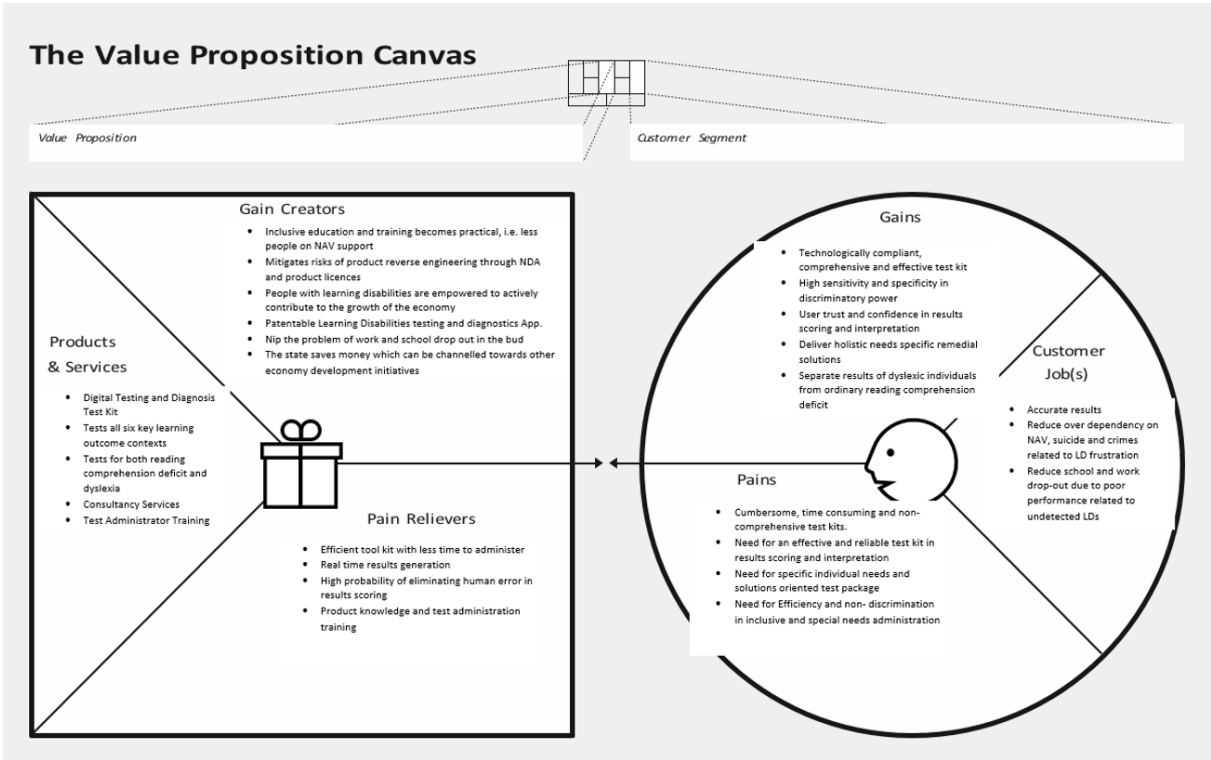


Figure 15: Literate AS Value Proposition

3.9.3 Promotion

Product promotion is usually very expensive, however, as a new start-up with limited funds, the company’s promotion strategy will be through direct marketing by contacting the identified target buyers through emails and phone calls. Literate AS hopes to establish a contract-based relationship with NAV through negotiations and preceding contracts of subsidiary business units like Ark and Tromprodukt. The team will also make presentations at exhibitions and conferences, conduct product pitches in high schools and continue to write in scientific journals, newspaper and magazine reviews. PPT Nordland has expressed interest in the product and are willing to sign a letter of intent to buy the product as soon as it is available. This information will be used as a selling line during the pre-launch promotions.

When the product is ready for the market, Literate AS will offer trials at reduced costs. All customers who will take the test during these trials and when engaged in long term contracts will sign the Non-Disclosure Agreements preventing them from sharing the methodology on which the product is based. Through networks, word of mouth is central to the product promotion. The Founder and CEO intends to continue her work as a scientist and researcher at UiT a position that will enable Literate AS to develop relations further with leading institutions in Norway and abroad. Building and sustaining strategic alliances in the industry is critical for the company's brand building, reputation and establishing a customer base.

3.9.4 Pricing

Literate AS will provide services at a fixed price based on the options described in the business model but the prices will be within the margin of prevailing market prices. The company will determine the competitive, standard pricing structure for each service pegged at hourly charges, fees for consulting services and standard price per test taken by each individual. This will be communicated to the customer as a pre-deliverable fixed price in the contract. However, clients are given the onus of determining which deliverables they would want to purchase. The description of the product and services will be defined in the contract, signed at the stage of the establishment of relations with the client. For the purposes of financial projections and budgeting, the fees for consulting services, testing and diagnostics, the price has been pegged at 300NOK per individual.

3.9.5 Distribution

During the launch phase, Literate AS will focus on the Troms County. Once the company has established its first clients, Literate AS will expand into Nordland and Finnmark. During the first two years, the digital version that has been designed to eliminate chances of human error in scoring results and break the barriers of geographical location and accessibility. Once the digital version is complete, Literate AS will begin work on the Sami version of the test kit which will be the base of our strategic competitive advantage in Finnmark. The digital version will be translated into other African languages for the African market. Each part of the value

chain has unique needs though similar to each other. Literate AS will tailor its consultancy services to meet the needs of the different customers in the value chain.

3.10 Conclusion

The study in this chapter sought to *evaluate Literate AS product's market opportunity and formulate the market strategy that compliments the product's sustainable competitive advantage*. This was achieved by conducting an internal and external analysis of the factors that influenced Literate AS' market position. An industry overview for both the globally and locally was presented. Data gathered from the empathy process was important in stakeholder mapping and provided in roads to market segmentation. Information gathered through analysing customer's unmet needs, motivations and the products they were currently buying vis-à-vis Literate AS' value proposition confirmed that there was a market potential for Literate AS. Even though there are several test kits on the market, Literate AS has the competitive advantage of being the only one that offers 6 sub tests in its screening and diagnostic portfolio. The product also has some added advantage of using less time in testing and the digital version which is key protected prevents unauthorised sharing thus giving Literate AS control over its intellectual property on the market. These critical outstanding features have been used as the selling point in building strategic synergies with target customers.

However, a closer look at the results of the PESTEL, Porter's Five Forces and SWOT analyses proved that the market was a highly contested one which also compromised Literate AS' perceived strategic competitive advantage. This information was important in influencing the company's market strategy. The industry is fast paced with many competing products being continuously developed and Literate AS had to decide on a strategy that will accelerate the formation of the whole product portfolio within a specific target market thereby optimizing its profitability and strengthening its market position. As such this study concludes by submitting that "Literate AS has the potential of serving a market niche of corporate service providers in testing, diagnosing, evaluating and assessing individuals with Learning disabilities in Norway. Literate AS will optimise its market position and value for its innovation by forging strategic alliances with NAV, PPT Ungskole og Videregående skole,

starting in Northern Norway and with time extend its marketing efforts to other regions. In Africa, Literate AS will start with Southern Africa, specifically South Africa, Botswana and Namibia.

4 Business Plan

4.1 Executive Summary

This business plan addresses Literate AS' commercialisation of the learning disabilities test kit. Literate AS is a start-up company registered in Tromsø, Norway since March 2016 and specialises in developing screening and diagnostics test kits for assessing people with learning disabilities. The learning disabilities and dyslexia testing and diagnosis tool was developed by the UiT and has been licenced to Literate AS for commercialization.

Norway has experienced a marked increase in the number of students who drop out of high school due to failure to cope with learning disabilities and the sub-sequent over-dependence on the social services system since 2008. Disability claims have become the third largest expenditure for the Norwegian Labour and Welfare service (NAV)³. According to NAV, 3 out of 10 people do not complete upper secondary school with projections showing that the surplus of labour without upper secondary qualifications could number almost 150,000 individuals by 2030⁴.

The technology developed by Literate AS is important to solving this problem. The Literate AS invention is a digital tool kit that tests for reading and comprehension deficit and dyslexia. The test has shown over 90% sensitivity and 73% specificity in discriminatory power. The test which targets individuals in the 16-65years age group can be used in schools and in the work place and is therefore the ideal solution to the problem.

The service will be offered to government public service agents like NAV, high schools, Pedagogisk Psykologisk Tjenester (PPTs) and private companies in goods and services sector in Norway. Activities at start-up are to be carried out in Norway. Marketing activities will start in Tromsø and Finnmark by December 2016 before going onto Nordland and other counties in Norway. Literate AS plans to venture into the international market, Sub-Saharan Africa at a later stage.

³ NAV Facts and Figures 2015

⁴ NAV Horizon Scan 2014

4.2 The Pain

In August 2016, the Prime Minister highlighted that many young people were dropping out of high school and there was need for a diagnosis for learning disabilities and a good support learning environment to compliment and improve on systems already in place. NAV estimates that about 20% of students in high school have learning disabilities. Current numbers are at 200 200 in high school and this figure has been stable for the last five years. In 2014, health benefits claims amounted to NOK 582 851 million and 4% of the Norwegian population between the ages 18-66 received work assessment allowances. NAV's goal is to help people find work and it deals with an average number of 12700 job seekers every month. Furthermore, according to the Norwegian Dyslexia Union, 20% of the Norwegian population have reading or writing difficulties, with 25-50% of these being dyslexic. These statistics indicate a symbiotic relationship between the increase in the numbers of high school drop outs and an increase on dependence on the social services support because the risk of unemployment is higher among people with low education levels. Statistics also show that a significant number of claims are from people with disabilities, learning disabilities like dyslexia and autism included.

Testing and screening individuals with disabilities is important for NAV and other stakeholders in the education and employment sector. This allows these institutions an opportunity to evaluate each individuals' challenges and recommend remedial solutions.

4.3 The Solution

Literate AS offers a digital screening and diagnosis test kit that can determine and detect various aspects of learning difficulties in both youths and adults, target age group 16-65 years old. The kit comprises of six subtests i.e. spelling, word identification, phonological decoding, writing efficiency test, reading comprehension test and vocabulary test. The tests contain an additional two sub tests which are not available in any other product on the market. These subtests provide a holistic overview of an individuals' learning disorders and have shown over 90% sensitivity and 73% specificity in discriminatory power. There are two kinds of reading disorders which are; *reading comprehension deficit* and *dyslexia* and the test covers both. The test takes 45 minutes to administer and can be administered by trained teachers.

The most unique feature of the battery pack is that it tests for both reading comprehension deficit and dyslexia and is the only test kit that is available in digital format.

4.4 Customers and Value Proposition

Literate AS' main target customers are NAV who are the buying customer for the kit to be used by its service agencies like Arbeidsrådgivningkontoret (ARK) and Tromsprodukt in the Vocational Occupational Rehabilitation projects. For instance, people who work with Tromsprodukt are individuals preparing to get new jobs based on their interest, capabilities etc, and the screening test kit should be part of the evaluation process, so that they can be evaluated on their needs to adapt to new jobs. The Pedagogisk Psykologisk Tjeneste (PPT) – Educational Psychological Counselling Services as the municipal advisory and expert body for issues relating to children, adolescents and adults who need special educational assistance will be the buyer and decision maker for use by elementary and high schools. The Ministry of Education will be decision makers for their respective departments as buyers for use by public schools. Currently, the Ministry of Education through the Department of Education and Training is working on introducing its own tool kit and Literate AS intends to tender for the contract to be the product developer for the ministry when it goes to tender in 2018/2019. The company's value proposition is summed up as, *“Literate AS offers a comprehensive, holistic and reliable overview of an individual's learning disorders by testing for reading, writing, comprehension disabilities and dyslexia in youths and adults.”*

Value proposition of the solution is as presented below.

| Description | Utilities |
|--|---|
| 8. Digital Form | Credible and authentic result- eliminates human error in scoring the test |
| 9. Accessed by author licence | Eliminates the danger of using pirated, reverse engineered tool kits |
| 10. Tests six sub tests out of the eight standard set test in learning disabilities screening | Provides a comprehensive overview of an individual's needs |
| 11. Secure log on procedure | Enhances data protection on user's confidential information |
| 12. Design | Technologically compliant, user and environmentally friendly. |
| 13. Structural control | Credibility, authenticity and reliability |
| 14. Consultancy | Socio- Psychological professional evaluation and assessment |

Figure 16: Literate AS Value Proposition and End User Utilities

4.5 Literate AS

“Literate” is derived from a Latin word which means “The one who can read and spell”! The current product, a test kit for testing and diagnosing individuals for reading comprehensive disabilities and dyslexia was developed by Dr. Trude Nergård Nilssen from researches and longitudinal studies in learning disabilities and dyslexia. Findings of these researches confirmed that impairments in phonological skills in pre-school and early school years place children at risk at later reading difficulties. The researches and studies were funded by the University of Tromsø. The product is owned by the UiT and has been licenced to Literate AS for commercialization. Phase 1 and Phase 2 funding of the product development were obtained from Innovation Norway while Norinnova provided incubational business development support.

4.5.1 Status of Innovation

A prototype has been developed and product testing for the market which is still on-going has been carried out on individuals who are out of school and employment and are on NAV social support benefit as they go through the Vocational Occupational Rehabilitation assessments and evaluation with Tromsprodukt AS. The tests were also carried out on private users at household/ domestic level who volunteered to test the tool kit. The pilot testing project started in June 2016 and will continue until March 2017. Literate AS will make its first presentation in Finnmark in December 2016 in preparation for the production of the tool kit in Sami language.

4.6 Organisation

Literate AS will start off with three substantive employees, i.e the CEO, the Director International Affairs and a Marketing Manager. The CEO, Dr. Nilssen will have the major say in how the business will develop. IT services will be outsourced to Plus Point and they will be reporting directly to the CEO. A board of directors will be appointed during the course of year 2 together with a substantive in preparation for the Department of Education tender in 2018.



4.6.1 Key Employees

Owner: Dr. Trude Nilssen Nergard

Dr. Nergard has a PhD in Experimental Educational and Cognitive Psychology and has previously worked as an advisor at PPT. She is currently employed as an associate professor of special education at ILP. Dr. Nergard's professional expertise is key in product development and is crucial to the brand Literate AS.



Director International Affairs: Elizabeth Tendai Ushewokunze



Ms. Ushewokunze is a qualified human rights professional who has just completed her master degree in Business Creation and Entrepreneurship at the University of Tromsø. She has served in different interdisciplinary strategic positions in learning materials research and development including special needs education in Zimbabwe and South Africa. She has excellent marketing and communication skills, strategic planning, business development and networking. She will work together with the Marketing Manager in promoting the product in Norway. Her skills, competences and international exposure are highly essential to the commercialization of the product on the international market in the future.

Marketing Manager: Oda Camilla Rykkje

Ms. Rykkje has previous experience as a contact person for the Child Service, librarian, and has participated in a start-up competition, a free-lance author, translator, and seminar leader. Her diverse portfolio and wide network is critical to building the brand Literate AS, developing strategic partnerships and business



alliances. She is currently studying for her master degree in Business Creation and Entrepreneurship at UiT. Ms. Rykkje will be responsible for marketing the product.

4.6.2 Business Partners

Plus Point: Digital Media Consultancy



Plus Point is an interactive studio based in Tromsø with expertise in developing digital productions, IT support, software development and social media marketing. Plus Point will provide consultancy services and are responsible for the product development, production and management including media marketing, software development for the user licences. Plus point has developed the digital tool kit and will continue to provide IT services.

Mission: We are committed to continuous development and provision of services related to the screening, testing and diagnosis of learning disabilities, dyslexia and associated activities in the work place and in school.

4.7 Market Size

The industry for testing and diagnosing learning disabilities is large and cuts across sectors, ranging from private use to institutional/ corporate use. Literate AS target market is that of PPT Videregående and NAV. Our potential market is quantified as follows;

- There is an average of 467 students in 427 different Upper-Secondary schools. We estimate that 20 % of the students have learning difficulties in reading and writing, and 5-10 % have dyslexia. On average, this means that there are 93 students with reading and writing challenges and 23-47 students with dyslexia in each school.
- There are currently 80,000 people in Norway who are currently looking for employment and from the 2008 research, 40% of this group have reading and writing difficulties. There is close to 32,000 people who are looking for employment, that have reading and writing challenges. About 8,000 to 16,000 people out of the estimated 32, 000 may be having learning disabilities. In Troms, these numbers can be estimated to 4,800 with learning challenges, and 1,200-2,400 with dyslexia.

- There are 312,000 people in Norway who receive social security money from NAV. 50% or 156,000 out of them have reading and writing difficulties, and 39,000-78,000 individuals have dyslexia. In Troms, these numbers can be estimated to be 6,000 with learning challenges, and 1,500-3,000 with dyslexia.
- Total Sami population in Norway is an estimated 40000. About 25000 of them live in Finnmark County.
- When estimating potential market, I have summarized the amount of people that are looking for work with 50% out of those who are receiving social security money and haven't received any diagnostic yet. Furthermore, I use the total amount of users to estimate the first year, and the new amount of users the last twelve months as an estimate for the following year.

4.8 Competitors

Literate AS has identified two major competitors, Logos(1995) and Kartleggeren (1998) compared to the rest of the market players. These two focus their service on the same target group as Literate AS. Kartleggeren considers itself the market leaders and their test kits are curriculum based focusing on the individuals' performance in English, Norwegian and Maths and covers most of the customer sectors. Kartleggeren also has an online test available for group testing. Logos from Logometrica is the only company that offers screening and diagnostic tests and is adapted for both kids and adults. Logos is the most popular on the market.

| | Literate AS | Kartlegg eren | Carlsten-Testen | Ordkjede testen | Setnings leseprøve | SOL | STAS | UDIR's Test | Logos |
|------------------------------------|-------------|---------------|-----------------|-----------------|--------------------|-----|------|-------------|-------|
| Pen & Paper | | | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Digital (No free copies) | ✗ | ✗ | | | | ✗ | | ✗ | |
| Norwegian and Sami Language | ✗ | | | | | | | | |
| Group Testing | ✗ | ✗ | | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Individual Testing | | ✗ | ✗ | | | ✗ | ✗ | | |
| Secondary School Grade 8-10 | | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | | ✗ |
| Upper Secondary School | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | | ✗ |
| Generates Report | ✗ | ✗ | | | | ✗ | | | |
| Digital System with a track record | | | | | | ✗ | | | |
| Administration time frame | ✗ | ✗ | | | | ✗ | | | |
| Manual results scoring | | | | | | | | | |
| Personal | ✗ | | | | | | | | |

| | | | | | | | | | |
|-------------------------|---|--|--|--|--|--|--|--|---|
| Support and monitoring | | | | | | | | | |
| Screening and diagnosis | ✘ | | | | | | | | ✘ |

Table 5: Major Competing Companies

Fagbokforlaget is the strongest of the two major competitors. Most of the company’s products portfolios are from business buy in. We are targeting the same market niche that Fagbokforlaget is possessing. This means once we have signed our first contracts, we have to move faster in getting in the other schools and counties because Fagbokforlaget will react.

4.9 Business Model

Literate AS’ business model is developed around the concept of increased out-put, establishing a solid customer base with long term contractual obligations. The business model below shows how Literate AS will generate revenue and obtain a profit from its product.

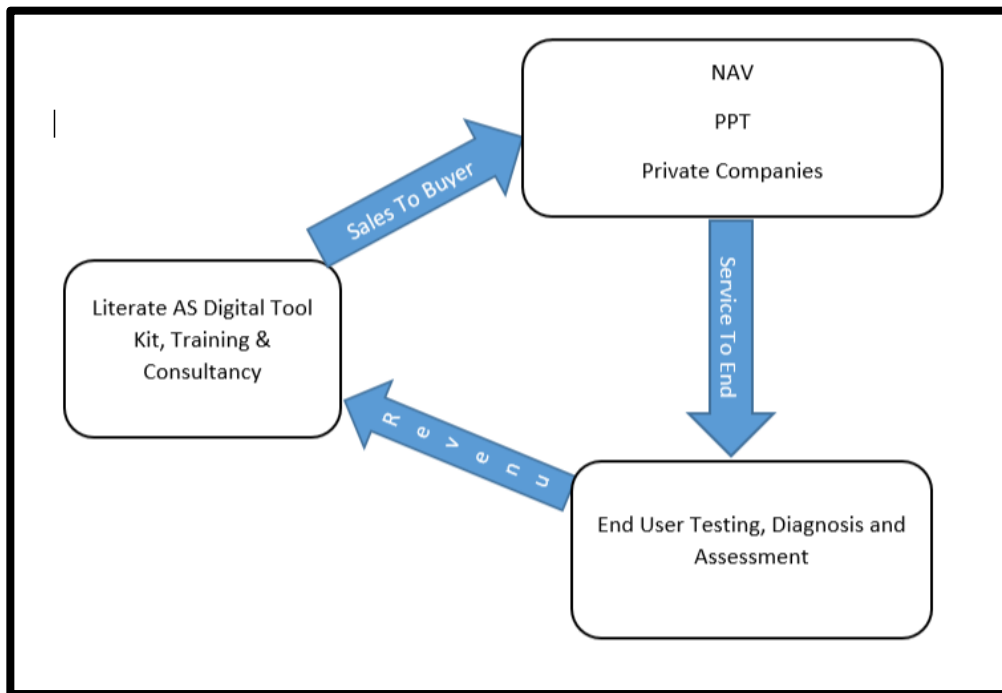


Figure 17: Literate AS Business Model

The market that Literate AS is venturing into has limited options on IPR that can protect the product from competitor manipulation and possible reverse engineering. In order for Literate AS to capitalise on IPR strategies like user licence, signing of Non-Disclosure Agreements and trademarks, Literate AS has decided sell its product on a Business to Business sales channel and to hold off sales to individual users at household level. Key target customers will be NAV, PPT and the Department of Education.

Revenues of sales will go directly to further research and development of the product into Sami language and the development of a new product; the test kit for 5-10 year old children. The income generated from sales will also be used to pay off dividends to UiT, the product developer and cover operating expenses. The buying customer which is NAV, PPT and the Department of Education will then commission their respective agencies to conduct the testing and diagnosis on individuals with learning disabilities. Depending on the results, Literate AS then engages the user in offering remedial solutions according to their needs and further assessments from a socio-psychological perspective. This way, the onus to keep the methodology of the test kit a secret is entirely on the buying customer. By limiting access to individual buyers Literate AS circumvents the possibility of having competitors on the market buy the product as prospective users only to use it to determine the product methodology. These measures will give Literate AS a chance to maintain its blue ocean for a while and maximise profits.

The estimated market price of screening and testing for reading and comprehension disorders and dyslexia is 3 000NOK per session for a group of 10 individuals with a possibility for discounts for bigger orders. This average price will be used in drawing up the budget and calculating the cash flow.

4.10 Market Strategies

4.10.1 Positioning

Literate AS will provide screening and diagnostics expertise for learning disorders as required by NAV, PPT and the Department of Education to evaluate all users registered in their

databases in the most efficient way. The product is tailored to the customers' specific requirements enabling them to screen people with learning disabilities, diagnose the individual's underlying disabilities and recommend remedial actions to be taken.

4.10.2 Promotion

Product promotion will be through direct marketing by contacting the identified target buyers through emails and phone calls. Literate AS hopes to establish a contract-based relationship with the buyers through negotiations and preceding contracts of subsidiary business units like Ark and Tromprodukt. The team will also make presentations at exhibitions and conferences, conduct product pitches in high schools and continue to write in scientific journals, newspaper and magazine reviews. Literate AS will also offer trials at reduced costs.

4.10.3 Pricing

Literate AS will provide services at a fixed price based on the options described in the business model. For the purposes of financial projections and budgeting, the fees for consulting services, testing and diagnostics, the price has been pegged at 300NOK per individual. This will be communicated to the customer as a pre-deliverable fixed price in the tender or price offer. However, clients are given the onus of determining which deliverables they would want to purchase. The description of the product and services will be defined in the contract, signed at the stage of the establishment of relations with the client.

4.10.4 Distribution

During the launch phase, Literate AS will focus on the Troms County. Once the company has established its first clients, Literate AS will expand into Nordland and Finnmark. Once the digital version is complete, Literate AS will begin work on the Sami version of the test kit which will be the base of our strategic competitive advantage in Finnmark. The distribution is earmarked for March 2017. Literate AS is finalising product development and has one major customer that is ready to sign a letter of intent to buy the product as soon as it is available for the market. The test kit will be digitally available with username and password access to be downloaded from the sky by users.

4.10.5 Service

Literate AS can be contacted by email, telephone and online chat through the company's website. All technical and software related concerns can be directed to the IT team at Plus Point.

4.11 Milestones

The organisation's activities will be more focused on continuous product development including translating it into the Sami Language and Setswana for the African market. See Appendix 3 for milestones description.

4.12 Financial Plan

4.12.1 Financing and Assumptions

Financing Literate will be financed in two phases; Phase 1 is about market testing and step 2 is about development of digital product.

Phase 1: This phase, the pre-incubators stage is financed by 80,000 NOK in subsidy/grant from Norrinova, and 20,000 NOK from the CEO. Dr. Trude Nilssen and the Director International Affairs will work as egen ansatt until December 2016. From April to December during year one, business development and strategy services will be offered by students from the School of Economics at UiT as part of their real industry case studies in Venture Creation and Business Strategy and Idea Evaluation.

Phase 2: This phase will be financed with 700,000 NOK in subsidy/grant from Innovation Norway. Financial projections for the internationalization of the product are not included here. Literate AS is still in negotiations with NORAD who is going to be the major funding partner.

The first two years of the company's life are mainly focused on product development in Norwegian and Sami languages as well as conducting normative studies on the African market and this is stated in the income statement. This will however turn around in the year three in which the company projects a net profit of over 3 000000NOK. This prediction is rational when compared to Logometrica. Compared to Literate they have less users (estimated to be 1 out of 5 that takes a screening-test), but are a known brand on the market, no international market ventures, higher price, but they have a net income of 7,764,000 NOK

Fig 4.1 Capital Requirement

| Capital requirement and financing during start-up | | | |
|---|-----------------------------|-----|--------------------------|
| Startup | | | |
| Capital requirements (The amount of capital needed during start-up) - all amounts need to be inclusive of VAT. | | | |
| New tools, machinery and equipment | | | 25,000 |
| Marketing | | | 100,000 |
| Liquidity for accrued costs, pending payments from customers. | | | 102,273 |
| Development costs | | | 500,000 |
| 10% backup (is calculated automatically) | | | 72,727 |
| Sum capital requirement | | | 800,000 |
| Financing (assets for the start-up): | | | |
| Equity - liquide assets from savings or co-owners. | | | 20,000 |
| Loan | Amortisation period (years) | 5.0 | Rate of interest: 10.0 % |
| Overdraft | | | Rate of interest: 6.0 % |
| Phase 1 Funding from Norinnova | | | 80,000 |
| Phase 2 Funding from Innovation Norway | | | 700,000 |
| Sum financing (will be the same as capital requirement): | | | 800,000 |
| Checksum (Financing - Capital requirement) | | | 0 |

Figure 18: Literate AS Capital Requirement

Literate AS anticipates to seal their first deal with NAV and PPT by December 2016. These two organisations have shown so much confidence in the test kit during the pilot testing and have committed to buy the product as soon as it is ready for the market. As such revenue projections indicate that the first contracts will give the company a gross profit of 1 062 000 NOK in 2016 and 3 075 148 NOK by the end of 2017. Assumptions are that NAV and PPT will be happy with the test kit and will sign up for more counties while the Finnmark region will bring in its first sales from at least one high school which will continue into 2018. 2019 closes at a gross profit of 21 545 228 as Literate AS anticipates to win the tender for the Department of Education in addition to its old renewable contracts with NAV, PPT, the prison services and private company deals secured in 2018. As Literate AS increases its networks and sales revenues, the company anticipates a gross profit of 9 332 390 by 2020. Literate AS hopes to have the tool available in Norwegian and Sami Languages, thereafter marketing efforts will include penetrating the Sami speaking region of Finland. Literate AS will start incurring a wage bill from 2017 as well as pay off the dividends to the University of Tromsø for the product licence. The wage bill is noticeably high in 2018 because the company will appoint a sales staff as well as a Director Finance. See illustration below on projected annual income from December 2016 to December 2020.

4.12 Critical Risks

The most critical risks are presented in the risk analysis (see Appendix 9). To prevent possible failures in the business and find ways to overcome them, the proactive steps are introduced concisely. In the risk table, the risk level is calculated based on the likelihood and consequences of the risk factors. The higher the risk level is, the riskier it is to the company. Based on the calculations, for Literate it means that the need for a competent management and operational team is highly important (lack of a competent team the risk level is 4/5). Easily copied product, lack of a commitment by customers and increased development costs are all in risk level of 4/5, bad market entry and reduced investment will cause risk level for 3/4.

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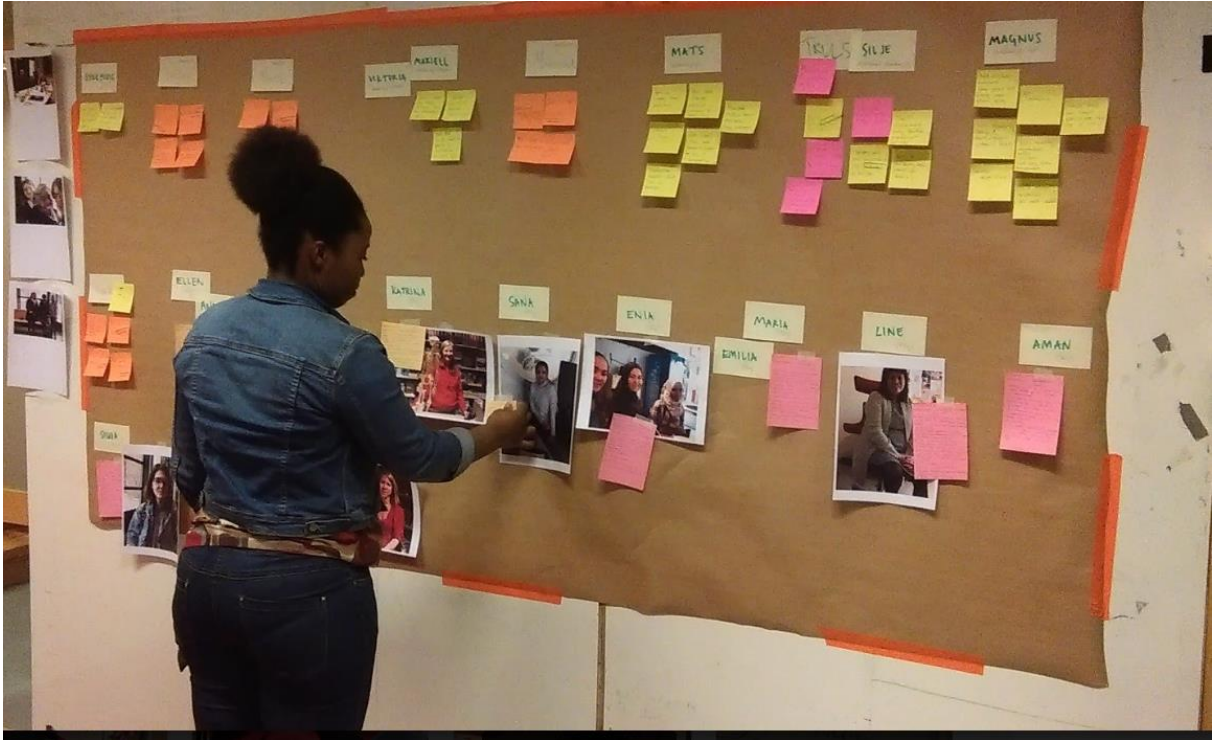
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Appendices



Appendix 1: Stakeholder Mapping

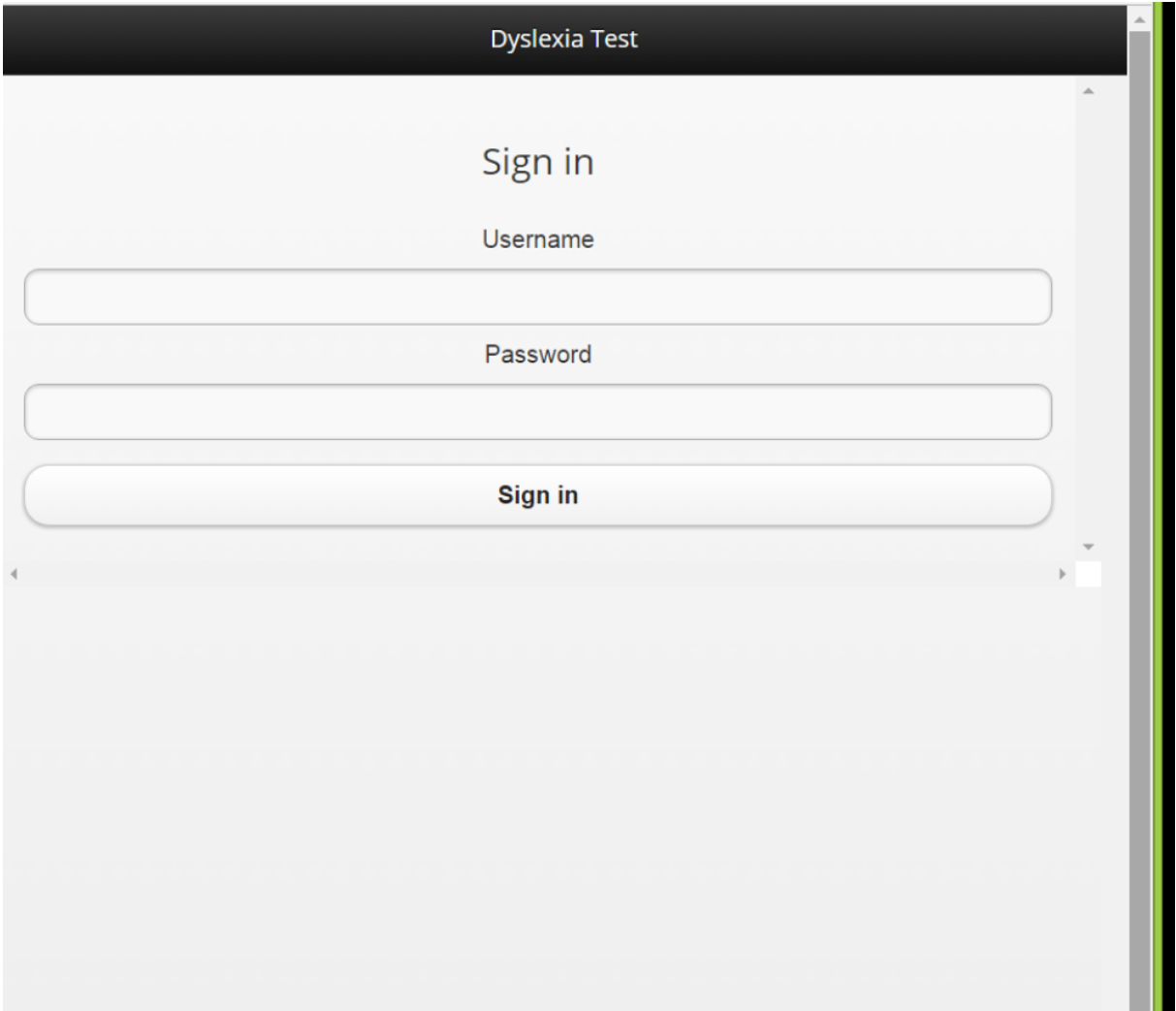
Literate AS Test Kit- Questionnaire for the Buying Customer

1. What do you know about learning disorders?
2. Do you have any learning disability test kit? If Yes which one?
3. At what stage do you consider screening anyone for Learning Disabilities?
4. Are there any red flags that may alert them on the need for testing?
5. What do they like the most from the tools they have use before?
6. What do they like the least?
7. Do you think randomly picking on individuals for screening and testing carries an element of discrimination?
8. What are the strengths of the tools they have used?- what are the weaknesses
9. Would you consider trying something new?

Literate AS Test Kit- Questionnaire for the USER Customer

1. Do you know anything about Learning disabilities?
2. When were they diagnosed and what prompted the tests?
3. Does it affect them in any way at school/ Work?
4. How much are they paying and who pays?
5. Do you feel stigmatised?
6. What did they like most about the test? What did they like the least.
7. Has the testing changed anything for them? In what way?

Appendix 2 Sample questionnaire



Appendix 3:Literate AS Test Log In

Dyslexia Test

| | |
|---|--|
| Fornavn | Etternavn |
| <input type="text" value="Fornavn"/> | <input type="text" value="Etternavn"/> |
| Fødselsdato: * | |
| <input type="text" value="dd.mm.yyyy"/> | |
| Dato for testing: * | |
| <input type="text" value="26.11.2016"/> | |
| Kjønn: | |
| <input checked="" type="radio"/> gutt/mann | |
| <input type="radio"/> jente/kvinne | |
| Skole | |
| <input type="text" value="skole"/> | |
| Trinn | |
| <input type="text" value="trinn"/> | |
| <input checked="" type="radio"/> yrkesfag | |
| <input type="radio"/> studiespesialisering | |
| E-postadresse * | |
| <input type="text" value="Email"/> | |

Appendix 4: Literate AS Test Log In Personal Details

2016

- Register Literate AS and sign Licence with UiT
- Apply for Phase 1 Funding from Norinova
- Sign Contract with Plus Point and start product development
- Product Pilot Testing
- Apply for Phase 2 funding from Innovation Norway
- Start Marketing activities in Troms and Nordland
- Start negotiations in Finnmark

2017

- Sign first contract with NAV and PPT
- Marketing and Sales activities intensify
- Contract consultant to translate test kit into Sami Language
- Sign contract with NAV and PPT Finnmark
- Start negotiations with Norad for partnership
- Appoint Board of Directors
- Pay off dividends to UiT
- Normative study in South Africa and Botswana

2018

- Sign contract with the Department of Education for the Northern Norway Region
- Bid for the Department of Education Tender
- Pilot test product in South Africa and Botswana
- Further marketing of products
- Start production of test kit for 5-10 year olds
- Sign contracts in Botswana and South Africa

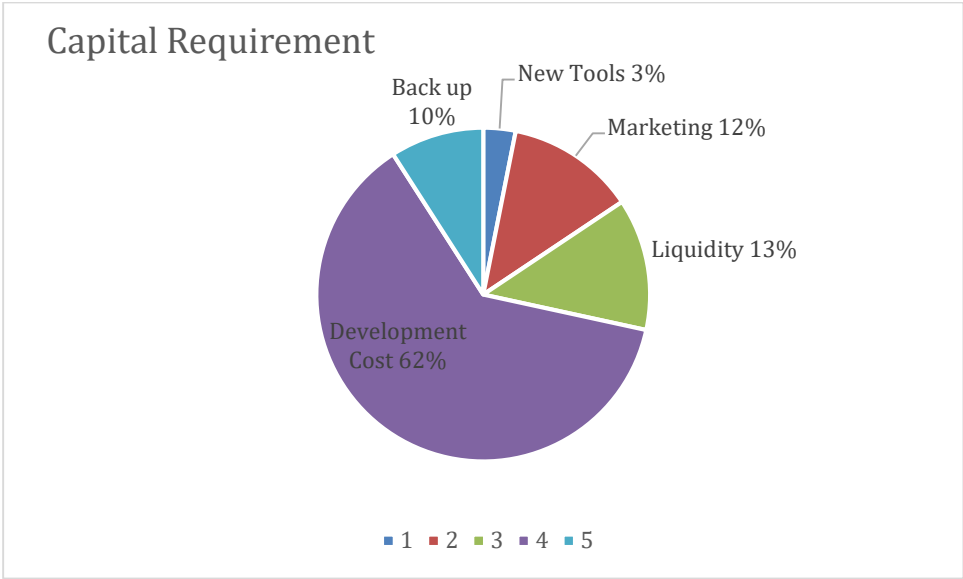
2019

- Enter Namibian market
- Enter Finland with Sami Version of product
- Further product development
- Launch 5-10 year olds test kit

2020

- Further product development
- Marketing and sales activities all year round
- Major contracts signed

Appendix 5: Literate AS Milestones



Appendix 6: Literate AS Capital Requirement Distribution

| Income statement | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| Literate AS | | | | | | |
| | | 2016 | 2017 | 2018 | 2019 | 2020 |
| | | Kroner | Kroner | Kroner | Kroner | Kroner |
| Sales revenue | + | 2,412,500 | 3,330,000 | 4,663,000 | 5,029,300 | 8,432,230 |
| Cost of goods sold | - | 0 | 0 | 0 | 0 | 0 |
| Gross profit | (A) = | 2,412,500 | 3,330,000 | 4,663,000 | 5,029,300 | 8,432,230 |
| Operating expenses (per. year): | | | | | | |
| Wages - employees, monthly salary x 11 | | 0 | 1,139,200 | 1,139,200 | 1,196,160 | 1,196,160 |
| Wages - owner, monthly salary x 11 | | 0 | 700,000 | 700,000 | 735,000 | 735,000 |
| Employers' national insurance contributions | | 0 | 89,997 | 89,997 | 152,561 | 152,561 |
| Vacation pay | | 0 | 220,704 | 220,704 | 231,739 | 231,739 |
| Consultant I.T. Services | | 50,000 | 50,000 | 100,000 | 150,000 | 150,000 |
| Rent | | 42,000 | 42,000 | 42,000 | 44,100 | 44,100 |
| Electricity | | 3,000 | 3,000 | 3,000 | 3,090 | 3,090 |
| Telephone, mobile, fax, internet | | 13,500 | 13,500 | 13,500 | 22,000 | 22,000 |
| Car expenses, leasing, gas, etc. | | 0 | 0 | 0 | 20,000 | 20,000 |
| Other travel costs | | 5,000 | 20,000 | 80,000 | 50,000 | 100,000 |
| Office supplies | | 2,000 | 3,000 | 3,000 | 3,000 | 5,000 |
| Other consumer goods | | 0 | 0 | 5,000 | 10,000 | 10,000 |
| Insurances | | 1,700 | 1,700 | 1,700 | 2,000 | 2,000 |
| Marketing (advertising, etc.) | | 30,000 | 50,000 | 50,000 | 100,000 | 150,000 |
| Accounting | | 0 | 50,000 | 50,000 | 50,000 | 50,000 |
| Depreciation | | 7,500 | 5,250 | 5,250 | 5,000 | 5,000 |
| Sum operating costs | (B) | 154,700 | 2,388,351 | 2,503,351 | 2,774,650 | 2,876,650 |
| Operating results (operating net profit) | (C = A-B) | 2,257,800 | 941,649 | 2,159,649 | 2,254,650 | 5,555,580 |
| Interest costs - loan | | 0 | 0 | 0 | 0 | 0 |
| Interest costs - other (bank overdraft etc.) | | 0 | | | | |
| Interest income | | | | | | |
| Sum financing costs/(revenue) | (D) | 0 | 0 | 0 | 0 | 0 |
| Earnings before tax (= Res. for pers. selskap) | (E = C-D) | 2,257,800 | 941,649 | 2,159,649 | 2,254,650 | 5,555,580 |
| Tax - 28 % of earnings before tax | (F) | 632,184 | 263,662 | 604,702 | 631,302 | 1,555,562 |
| Net income (for companies organized as AS) | (G = E-F) | 1,625,616 | 677,987 | 1,554,947 | 1,623,348 | 4,000,017 |
| Private withdrawal (if sole proprietorship) | | | | | | |

Appendix 7: Literate AS Income Statement

| Risk Factor | Probability | Consequence | Most Probable Reason | Remedial Action |
|---|-------------|-------------|--|---|
| Lack of commitment by customers | 3 | 5 | Over confident of market indicators at pilot testing | Re-engage with customers to find common ground |
| The market does not appreciate the proposed value | 2 | 5 | Underestimated competitor products | Go back to the market and conduct more surveys |
| Lack of competent management team | 2 | 4 | Focused on keeping the salary budget low at the expense of market deliverables | Appoint other support staff |
| Norinova offers less money on anticipated subsidy | 3 | 4 | Unrealistic financial projections | Take up more loan from the bank |
| Do not win the DoE tender | 3 | 4 | The competition is stiff and DoE may choose a known brand | Focus on developing new products for the current market and keep customers content with brand Literate AS |
| Converting tool kit into digital format takes longer than anticipated | 2 | 2 | Underestimated the work load | Delay product launch |

Appendix 8: Critical Risk Analysis