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**IDENTIFYING THE VALUE PROPOSITION FOR A NOVEL SENSOR-BASED INDOOR
AIR QUALITY IMPROVEMENT SERVICE (CASE: VTT)**

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<p>Abstract</p> <p>In the past few years, indoor air quality has become a prominent issue in scientific and public domains because the buildings are incompatible with meeting the air quality objectives. The pollutants in indoor air are higher compared to outdoor air. As a result, indoor air pollutants generate a solid correlation with respect to health impairment. The adverse consequences of health create a significant effect on an individual's productivity. People who are a part of vulnerable groups like children are more affected by the exposure of poor indoor air quality as the children have an immature respiratory and immune system. Considering the adverse effect of poor indoor air on health, the case company has developed a novel sensor-based indoor air quality improvement service for school.</p> <p>The objective of this study is to comprehend how value proposition could be identified for this type of novel sensor-based indoor air quality improvement service. This study treats different concepts of value to create a relation in identifying the value proposition. The value proposition for this study is identified by using the value proposition canvas. The tool-assisted to identify distinct value proposition by recognizing customer requirements.</p> <p>This thesis follows the nature of qualitative research, and case study method is applied to conduct the research. According to the method of this study, empirical data is collected through a semi-structured interview and focus group interview. Stakeholders were chosen as the sample for this research as they hold knowledge or expertise in both indoor air quality and indoor air quality improvement services.</p> <p>The findings from this thesis outline that value proposition canvas can be combined with value co-creation in identifying value proposition for novel sensor-based indoor air quality improvement service. The credibility of using this process for identifying value proposition can be evaluated as value is created for the customer by recognizing the customer requirements. In this research, theoretical contribution agrees with the existing customer value proposition canvas and based on this the value proposition canvas is being extended by inserting value creation, and the tool is used through a co-creation process to recognize the value proposition.</p> <p>The case company can utilize the identified value proposition to captivate potential stakeholders. The value proposition would assist the case company in distinguishing the innovative indoor air quality improvement services from the existing technologies in the market. Future research can continue identifying the complete advantage of the novel service based on the identified value proposition.</p>			
Keywords Value proposition, Value proposition canvas, Indoor air quality			
Additional information			

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List of acronyms

IAQ - Indoor air quality

VCC - Value co-creation

VP - Value proposition

VOC - Volatile organic compounds

VPC - Value proposition canvas

HVAC - Heating, ventilation and air conditioning

BRI - Building related illness

SBS - Sick building syndrome

1 INTRODUCTION

The introductory chapter unveils the purpose of the thesis to the readers. The chapter aims to captivate the readers by portraying the research gaps. In this chapter, the readers will also discover the research questions which are formulated to close the research gaps and reach the objective of this thesis. Finally, the structure of the thesis is portrayed where the reader will get an idea of each chapter.

1.1 Research background

Indoor Air Quality (IAQ) plays a major role in the domain of people's health and due to poor IAQ, there might be both long term and short-term health effects. The problems and impacts of poor IAQ are not completely understood by occupants. In a daily cycle of 24 hours, people spent most of their time indoors as a result indoor air quality has a directly proportional relationship to health issues. Jones, (1999) claims that the effect on health is more within the vulnerable group such as older people and children. Children are vulnerable among other groups of people because they are in the state of physical development which requires adequate IAQ within public spaces like schools (USEPA, 2010).

Pollutants of the indoor air have the possibility to generate disability, morbidity, disease and in intense cases even death. Depending on the individual's sensitivity to the concentration of the contaminant, the present situation of the psychological and physical health, time span and frequency of exposure affects individual's health because of the existence of certain pollutant in the air. Indoor air quality has an impact on the productivity of school children and adults. Wargoeki and Wyon, (2017) ; Al Horr, Arif, Katafygiotou, Mazroei, Kaushik and Elsarrag, (2016) reported that the performance of works like proofreading, mathematical tasks, text-typing, memorization, and reading are affected because of indoor air quality. As the productivity is reduced it might have a negative effect on an individual's health because there lies notable impact on the degree of stress triggered by the sense of self-efficacy (Bodys-Cupak, Majda, Zalewska-Puchala, Kaminska et al., 2016). Alberdi, Aztiria and Basarab, (2016) argues that in Europe the second most frequent

work associated health problem is stress and it is responsible for losing half of the working days among European enterprises. There might be symptoms associated with sick building syndrome among the occupants. Usually, the symptoms get worse for an individual when the duration of staying in the building is more and it reduces or disappears when the building is left (Jones, 1999). In this situation, the issues created the importance of indoor air quality solution for the vulnerable groups.

An environment in the presence of better IAQ generates several benefits which are responsible for creating impacts on an individual's productivity. A novel indoor air quality improvement service is the solution believed to improve the quality of life. In this thesis, the case company, VTT came up with a novel idea that aims to improve IAQ at schools. The novel IAQ improvement service for schools consists of different indoor sensors to determine the IAQ inside the school, wearable gadgets combined with personal feedback from users and information related to environment sensing aims to create a healthier environment for teachers, pupils and staff members working at school.

The idea is still in the conceptual stage and in order to give it a tangible shape for end users, the case company requires collaboration from stakeholders. It is obvious from the aspect of stakeholders that the novel IAQ improvement service requires to be feasible and generate value that would be appreciated by users. If end users appreciate the value of the novel service, there might be a rise in demand which would turn the novel service into a profitable business for the stakeholders. In this stage, the case company aims to identify the value proposition of the novel service to captivate different stakeholders about the value the novel service is going to generate for end users.

1.2 Purpose of the research

Over the past few years, the customer value proposition in the domain of business has turned into one of the broadly used terms (Anderson, Narus Rossum, 2006; Carter and Ejara, 2008). The value proposition is broadly used in various academics and industries, but there lies, only a little research which studies the concept in depth

(Frow and Payne, 2011). Developing value proposition for a certain product or service assist companies to picture the value and captivate target customer segment. Especially in the case of developing new services or products, it is a crucial task for marketers to create value for customers (Smith and Colgate, 2007).

The aim of this thesis is to identify the value proposition for the novel sensor based IAQ service. The value proposition is required to be identified in a way that portrays the value the novel service is generating is ultimately solving the problems and generating benefit for users. Identifying the value proposition for the novel service aims to portray the stakeholders (target customer segment) the benefits the novel service is likely to generate. Hence, the stakeholders are involved in crafting the value proposition for the novel service. This thesis portrays that value proposition is identified through collaboration between stakeholders and the case company.

Value proposition canvas is used as a tool to identify the value proposition for the novel service. The initial stage of starting communication with the offerings of a specific product or service the companies usually comprehend the target customer segment and then the offerings are communicated. Value proposition canvas provides a holistic approach to understand the target customer precisely and generate value proposition according to the customer's desire (Osterwalder, Pigneur, Bernarda, Smith 2014, p. 9). In the end, the value proposition canvas assists companies to discover whether the company's offerings are meeting customer's desire.

1.3 Research gap

Value proposition canvas is a prominent tool in collecting target customers' information and design the company's offering in a way that addresses the needs of the customer (Osterwalder et al., 2014, pp. 6-9). The tool is widely used and recommended in business meetings and seminars by the consulting firms, and in examining value proposition canvas the book used in this thesis is cited around 700 times, there still lies proper testing method of this concept in the field of indoor air quality improvement technology. Hence, this creates the research gap and the study

is trying to fulfill the gap by using the tool to identify the value proposition for the novel sensor-based indoor air quality improvement service. In fulfilling the identified gap, the concept will create more significance in the ground of academics.

Value propositions play a major role in value co-creation within different stakeholders (Frow and Payne, 2011). In this research, the value proposition canvas will be used through co-creation with the stakeholders. The value proposition canvas is built encompassing teacher as they are the end user of the novel service but the data was not gathered from the teacher because potential stakeholders are the customer segment for this research so stakeholders stepped into the shoe of teacher and created the customer profile as well as value proposition canvas. The value proposition canvas was not combined with co-creation before, so this is the gap the study is trying to fulfill and find the value proposition for the novel service through co-creation.

1.4 Research questions

The aim of the research is to identify the value proposition for the novel sensor based indoor air quality. This thesis is blended with a theoretical section where the previous literature is being studied and the empirical section provided the data in the context of the research. In meeting up the research objective and fulfilling the research gaps the research questions are introduced through which the primary data was gathered for this thesis.

The key research question for this thesis:

How can the value proposition for this type of novel technology-based service be identified?

It is important to identify the elements that generate value from the novel sensor based indoor air quality service. The value proposition canvas requires to gather data from different dimensions. Hence, the main research question covers many elements and it is much wider, so the main research question is broken down into three sub-

research questions. Creating the sub research questions assisted in collecting the data more precisely.

The three research sub-questions are:

a) What are the value images for this novel service?

The value images consist of customer jobs, pains, and gains. The question aims to identify the jobs, pains and gains separately that would assist to gather data for constructing the customer profile.

b) What are the things that will be gained using the novel service?

The positive things that customer wants to attain through using the novel service. This question aims to identify the “gain creators” in the value map.

c) What are the pains that will be relieved using the novel service?

The pains that customer wants to avoid through using the novel service. This question aims to identify the “pain relievers” in the value map.

1.5 Structure of the study

This thesis consists of nine chapters in total. The first chapter gives a brief idea about the study considering the research gap and research questions. In the second chapter different aspects of indoor air quality is described where the impacts and factors of poor id discussed. The chapter also includes a discussion about the benefits of improved air quality. Chapters three, four and five are the theoretical sections of this study where previous studies based on the objective of this research is discussed that assisted to construct the theoretical framework of this study. In Chapter six, the case company is introduced, and the method used to conduct this research is discussed. The chapter also gives the idea about the data collection process and sampling technique. The seventh chapter encompasses the empirical part of the study where the discussion is continued based on the gathered data. This chapter aims to provide

an idea about the data generated from interviews answering the research questions. In the eighth chapter, the analysis of this research is portrayed where a blend is formed between the empirical and theoretical sections that assisted to craft the value proposition canvas for this research. The final chapter of this thesis contains the answers to the research question, theoretical contribution, managerial implication, limitations and suggestions for future research. After all the chapters, a reference list is added at the bottom which portrays the list of articles the researcher used for constructing the theoretical framework of this thesis.

2 INDOOR AIR QUALITY

There are basically two reasons for Indoor Air Quality (IAQ) being the context of this research. Firstly, it became a very important issue in relation to health in recent years. Previously studies were based on outdoor air quality and its impacts on human life (health issues) but now it is seen that IAQ plays an important role in relation to health issues as people spend more time indoors (Jiang, Li, Tian, Piedrahita, Yun, Mansata, LV, Dick, Hannigan and Shang, 2011; EPA, 2000; Wang and Zhang, 2011; WHO, 2010). Many devices and sensors are developed by companies whereas researchers are identifying novel concepts to control IAQ which sates the second reason for this study. The case company in this research developed a novel indoor air quality service to create better IAQ and believe this would create value for the users.

The quality of air inside and around the structures and buildings, mainly related to health issues and comfortableness of the building occupants is referred to as IAQ (USEPA, 2017a). The air quality within homes, schools, offices, health care premises, day care centers where individuals spend a huge portion of their time is an extremely important determinant of well-being of the people and healthy life (WHO, 2010) so according to (Fanger, 2006) IAQ must be explained in terms of its impact on human productivity, learning, health, and comfort.

Over the last few years, IAQ has caught significant attention in scientific and public domains because most of the buildings appear far behind for not meeting air quality objectives (Jiang et al., 2011). Human exposure studies to pollutant in air showed that many pollutants in the indoor air levels could be two to five times and sometimes 100 times higher compared to outdoor level (Wang and Zhang, 2011). EPA and SAB performed comparative risk studies where they consistently classified indoor air pollution as one of the top five environmental risks in public health (Wang and Zhang, 2011).

All over the world indoor air pollutants creates a solid correlation in respect to health impairment and the adverse effects on people's health caused by IAQ problems became an issue of anxiety in countries of different economic classes (WHO, 2010).

People spend most of their working hours indoors which also drives the attention of IAQ (Wang and Zhang, 2011). Moreover, most of the people spend over 90% of time staying indoor (Jiang et al., 2011; EPA, 2000 and Fanger, 2005).

2.1 Impact of poor IAQ

Poor IAQ is a significant global public health risk because indoor environments consist of various chemical, biological and other environmental risks (Wu, Jacobs, Mitchell, Miller and Karol 2007). “Indoor air pollutants can cause or contribute to short-term and long-term health problems” (Madureira, Paciência, Rufo, Ramos, Barros, Teixeira and de Oliveira Fernandes, 2015). Seltzer and James, (1994) classified illness in relation to buildings into two groups: building related illness (BRI) and sick building syndrome (SBS). The term BRI refers to human illness due to exposure to pollutants in airtight buildings which has poor ventilation (Abigail, 2017a). Chest pain, cough, cancers, miscarriages, edema, shortness of breath, nosebleeds, palpitations and pregnancy problems are the symptoms related to BRI diseases (Sumedha, 2008). SBS refers to the category of health illness which are caused due to the indoor environment like a dwelling or an office building (De Dear and Brager, 2002 via Al horr et al., 2016). The symptoms get worse in relation to the time spent by an individual in the building whereas after the building is left the symptoms decrease or disappear (ESTABLISH D2.1, 2017, p. 5). Biological and chemical pollution, uncomfortable temperature, psychosocial status, and physical condition seem like some of the main reasons for SBS (Al horr et al., 2016). People who experienced the symptoms of SBS include irritation of nose, throat, and eyes, cough, headache, cognitive disturbances, gastrointestinal distress, depression, wheezing, light sensitivity, allergies, fatigue, symptoms related to flu and higher chances of asthma attacks (Sumedha, 2008; Al horr et al., 2016).

Specifically, exposure to poor IAQ may harm vulnerable groups like elderly people, children or people who are suffering from cardiovascular and chronic respiratory diseases. (Cincinelli and Martellini, 2017). As children have an immature respiratory and immune system, breathing pattern and lower BMI they are more likely to be affected by air pollution compared to adults and two of the diseases allergy and

asthma are the most common ones among children (Madureira et al., 2015). In addition, pollutants in indoor air can cause discomfort, lower productivity and attendance at school (Madureira et al., 2015).

2.2 Factors affecting IAQ and sources of IAQ problems

In any building, there are different factors that make up the indoor environment (IE). The IE in a building is the consequence of the interaction between climate, site, the design of the building, building occupants, construction techniques, the furnishings, materials of the building, moisture, activities, and processes inside the building and outdoor sources as well. The various chemical may affect IAQ, including gases like ozone, radon, carbon monoxide, particulate matter (PM), volatile organic compounds (VOCs), biological particulate matter like pollen, bacteria, and fungi and inorganic and organic contaminants (Layton, 2012).

According to Layton, (2012) there are four elements: source; heating, ventilation and air conditioning (HVAC); pathways and occupants which are involved for developing the IAQ problems and this is represented in table 1.

Table 1. Elements involved in developing IAQ problems (adapted from Layton, 2012).

Sources	There exists a source of contamination or discomfort indoors and outdoors, or inside the mechanical system of the building.
HVAC	The HVAC system does not have the ability to control the existing contaminants in the air, but it confirms thermal comfort (the conditions related to humidity and temperature which are comfortable for most of the occupants in a building).
Pathways	One or more pollutant pathways link the pollutant source with the occupants and there is a driving force for moving pollutants along the pathways.
Occupants	Occupants and behavior within the building.

Layton (2012) states that indoor air pollutant sources can drive from outdoors and indoors as a result controlling the pollutant sources is critical for managing IAQ

problems. If the sources of the pollutant are not managed, IAQ problems may emerge even the HVAC system is well-maintained and designed properly (Layton, 2012). Over the last few years, there is plenty of scientific verification which indicates that air inside buildings is likely to be more polluted compared to outdoor air (USEPA, 2017d). Indoor air usually consists of different pollutants at concentrations which do not have any guidelines or standards related to occupational exposure, so it is tough to identify the concentrations of specific pollutant creating specific health problems to exposures due to different pollutants in low levels of concentration is creating health problems (Layton, 2012).

(Layton, 2012) divided air contaminant sources into five different categories which are depicted in the table 2.

Table 2. Five different categories of sources of air pollutants (adapted from Layton, 2012)

Categories	Explanation
Sources around the building	<ul style="list-style-type: none"> • Polluted outdoor air that consists of (fungal spores, dust, pollen, vehicle exhaust, and industrial pollutants) • Nearby sources generating emissions (odors from containers of rubbish, unhygienic debris, loading docks, re-entrained exhaust from nearby buildings) • Soil gas (pesticides, radon, leakage from fuel tanks beneath the ground, pollutants from the sites used before such as landfills) • Moisture or water advancing excessive microbial growth (crawl space, rooftops after there is rainfall)
Equipment	<ul style="list-style-type: none"> • <i>HVAC system</i> Dust in ductwork or in other components Microbiological expansion in humidifiers, coils, ductwork, drip pans Refrigerant leakage Inappropriate use of cleaning compounds, sealants, biocides • <i>Non-HVAC equipment</i> Office equipment emissions (ozone, organic compounds that are volatile) Emissions from labs, shops, cleaning processes
Human Activities	<ul style="list-style-type: none"> • Personal activities (cooking, body and cosmetic odor, smoking) • Housekeeping activities (emissions from thrash, cleaning materials, fragrances and deodorizers usage, airborne dust) • Maintenance activities (emissions from the supplies that are stored, pesticides from activities related to pest control, volatile organic compounds (VOCs))
Building components and furnishings	<ul style="list-style-type: none"> • Locations that generate dust (open shelving, textured surfaces like curtains, carpeting, old furnishing, materials that contain damaged asbestos) • Water damage and unhygienic conditions (microbiological expansion on furnishings that damaged by water, water remaining from drains that are poorly designed or clogged) • Chemicals discharged from components of buildings or furnishings (inorganic compounds or VOCs)

Other Sources	<ul style="list-style-type: none"> • Accidental events (water spills or spills of other liquids, fire damage, microbiological growth from because of flooding or leakage of roofs, piping) • The building that is mixed-use and special use spaces (laboratories, exercise rooms, beauty salons, smoking lounges, food preparation spaces) • Remodeling/redecorating/repair activities (new furnishings generating emissions, dust from demolitions, micro-biological pollutants generated from remodeling or demolition activities, odors and inorganic compounds and VOCs from paints, adhesives)
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2.3 Outcomes of improved IAQ

Improving the IAQ assists to generate several positive results and effects the occupants from the aspect of both health issues and comfort. Two surveys conducted by (Wargocki and Wyon 2007; Al Horr et al. 2016) summarized outcomes of different works which reported IAQ has a remarkable influence on the performance of test subjects like proofreading, mathematical tasks, text-typing, reading, and memorization. Comfort related to thermal issues also plays an important role in relation to occupant productivity (ESTABLISH D2.1, 2017, p. 7). If productivity is reduced it might affect negatively on an individual's health because effectiveness has a notable effect on stress level and in Europe stress is counted as the second most common job-related health problem (ESTABLISH D2.1, 2017, p. 7).

Studies claimed that if IAQ is improved it increases productivity and enhances performance related to mental tasks, like better concentration and recall among children and adults (USEPA, 2010). Bakó-Biró, Clements-Croome, Kochhar, Awbi and Williams, (2007) presents the evidence that enhanced ventilation benefits the occupants in learning performance. Poor performance in schoolwork may have long-term effects on a student and society (Wargocki and Wyon, 2007). At a lower rate of ventilation, students were stressed because they found it tough to carry out schoolwork and it was observed that school performance has improved after ventilation rate in the classroom was increased (Wargocki and Wyon, 2007). Higher ventilation rates within offices about 25 l/s per person minimize sick leave and SBS symptoms (Sundell, Levin, Nazaroff, Cain, Fisk, Grimsrud and Samet, 2011). Al Horr et al. (2016) states that there is a loss in productivity if the occupant is dissatisfied with thermal comfort. Studies show that changing in temperature from 18

°C to 30°C may affect the occupant's performance in tasks such as learning, reading, typewriting and performance (ESTABLISH D2.1, 2017, p. 7).

3 COMPONENTS OF VALUE FOR UNDERSTANDING VP

For understanding the domain of value proposition, it is important to comprehend the value in a business environment, the importance of customer value and how value is created. In the current chapter, a holistic approach is taken to understand value from four different aspects. In the initial stage, the definition of value is discussed that explored the path to understand the customer-centric view of value followed by value creation and value co-creation.

Vargo and Lusch, (2004) states that the firms delivering the services and products can only propose value proposition of their offerings and it is customers who determine the value for a certain product or service. According to Töytari and Rajala, (2015) value is interpreted as bundles of sacrifices and benefits which a customer experiences from an acquired service or product. The estimation of a customer towards a service's or product's benefits and ability to meet certain wants and needs shapes the value it attaches to it. Usually, after measuring the similarities and dissimilarities among alternative brands, services, products, customers choose the ones that they believe deliver the most satisfying benefits. Value is, therefore, an outcome of built-in product characteristics, price, and service and to different customers, it means different things (Mullins, Walker, Boyd and Larréché, 2013, p. 11).

Customers, in order to meet their needs, buy products or services but in actual aspect, they are buying the benefits, not products or services. The definite benefits sought to differentiate between customers based on the needs they are looking for to be satisfied and the circumstances in which products or services are used. Since different benefits are sought by different customers, they use dissimilar choice criteria and include different significance to products attributes when selecting brands and models in a certain product category. Figure 1 portrays the buying thought process of the customer. The first stage in the buying thought the process of customer needs to satisfy. The second stage in the process is benefits sought that is measuring the benefits of a certain offer. The benefits vary between customers based on their choice criteria, needs and significance attached to products attribute when

selecting brands and models in a certain product category. Then comes the choice criteria which buyers attach in relation to the service or product attributes and make a choice. Fourthly comes the product or service attributes which are about the perception of the product such as quality, appearance, price, and delivery. The last stage in the process is about customer considering a product brand or a service provider (Mullins et.al. 2013,10).

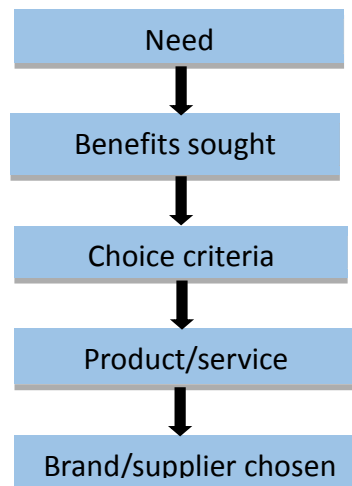


Figure 1. Customer buying thought process (adapted from Mullins et al., 2013, p. 10)

3.1 Customer value

The definition of the word value is often used to define customer value and it is also used in other value aspects of the organization (Pane and Holt, 2001). Customer value is customer centric (Rintamäki, Kuusela and Mitronen, 2007). The value of the customer is typically seen as a trade-off between the costs and benefits involved within an exchange (Keränen and Jalkala, 2013). Customer value concentrates on the value derived from the event of consumption by customers (Pane and Holt, 2001). According to Rintamäki et al.'s, (2007) customer value is formed when customers find more benefits compare to sacrifices, so customer value is a trade-off between sacrifice and benefits. Therefore, customer value is generated through benefits from a product or service in a consumption process. Intangible assets such as skills, knowledge, and reputation are often regarded as a non-monetary customer value source (Keränen and Jalkala, 2013). Pane and Holt, (2001) shares that the next source of competitive advantage is customer value whereas in recent years Töytari

and Rajala, (2015) stated that a key to the success of a company on competitive markets is designing superior customer value. In products, customer value is not embedded because products only facilitate value (Gönroos, 2001, p. 24). Value is not created by suppliers solely through delivering customers with products and service, but by assisting them in their business processes by delivering and integrating resources that satisfy specific customer function (Keränen and Jalkala, 2013).

According to traditional marketing concepts on exchange perspective firm basically creates customer value at the back office of a service-oriented firm and in the factory for products and embedded within a product or service which is then delivered to customers where the focus is to deliver reproduced value to customers (Gönroos, 2001, pp. 24-25). In relation to the traditional marketing concept, Gönroos, (2001, pp. 24-25) argues that the focus should be on the value-creating a process of customers where value appears for customers rather than concentrating on products.

Gönroos, (2001, pp. 24-25) stated that customer value is produced throughout the relationship by the customer and partial interactions between the service provider and customer. The customer value perception between offering and customer is interactive (Rintamäki et.al., 2007).

3.2 Value creation

In the business environment firms offering novel products or services are trying to play their trump card through creating a point of difference for having a competitive edge in the market which brings up the importance of understanding value creation. It is a crucial job for marketers to create value for customers, especially while developing new services or products (Smith and Colgate 2007). (Lepak, Smith and Taylor et al., 2007) suggests that the degree of creation of new value depends on the subjective assessment of the appropriateness and novelty of the new service or product being considered by the target user. The main objective for any business is to comprehend the value for customers and create those value for them as customers are the ones who judge the value, so it is the role of the firms to identify, clarify and

provide value on the basis of what customers are looking for (O'Cass and Ngo, 2011). The only possible way of value creation takes place when a service or product is consumed by customers so a product or service which is not sold possess no value (Gummesson, 1998). In marketing value creation for the customer has been acknowledged as a prime concept (Smith and Colgate, 2007). Grönroos, (2011) argues that value creation consists of a process that improves the user in some respects (Grönroos, 2008) or increases the well-being of the customer (Vargo et al., 2008). The creation of customer value is a prior condition for capturing value (Töytari and Rajala, 2015). O'Cass and Ngo, (2011) claims that value creation is basically a multi-stage and dynamic process involving various value users. The process consists of two theoretical distinct subprocesses which are supplier's process for delivering resources for the usage of customers and customers' process where service is turned into value (Grönroos and Ravald, 2011). In the case of new service or product generating benefits for the target user, value creation requires innovation which increases consumer's evaluation on benefits of the consumption (Lepak et al., 2007). One of the keystones of B2B marketing is the creation and delivery of superior value for customers (Töytari and Rajala, 2015).

The creation of value is externally determined through relationship value (Payne and Holt, 2001; Ravald and Grönroos, 1996), the perceived value of a customer (Zeithaml, 1988) and exchange value (Bowman and Ambrosini, 2000). (Vargo and Lusch, 2004, pp. 10-11; Eiglier and Langeard, 1976; Grönroos, 1978 via Grönroos and Ravald, 2011) mentioned that customer always acts as co-producer who contributes through co-production in value creation. According to Adner and Kapoor, (2010) the competitive advantage of a firm depends on the firm's ability to generate more value compared to its rivals. In turn, higher value creation is based on the ability of the firm for successful innovation (Adner and Kapoor, 2010).

There are two main economic conditions which may be essential in the value creation process to endure. The first economic condition is the amount of money exchanged is required to be higher than producer's costs of creating value. The second economic condition is the amount of money exchanged by a user is a function of performance perceived difference in performance between the closest alternative

to the target user and the new value which is created. In the absence of these excesses, neither the value creator nor the user will show willingness over the long term in the activities (Lepak et al., 2007).

3.3 Value co-creation (VCC)

VCC has caught the eye of practitioners and academics as a comprehensive concept which defines the collaboration between several stakeholders (Prahalad and Ramaswamy, 2000).

The interpretation of value and procedure of value creation are shifting rapidly from a company and product-centric view towards personalized experiences of consumers. Consumers who are empowered, informed, active and networked are increasingly engaged in co-creating value. The communication between the company and the consumer becomes the locus of creation and extraction of value. VCC is about value is created jointly by the customer and the company. The key to open new origins of competitive advantage is superior communications that allow a customer to co-create distinctive experiences with the company. Co-creation is basically developing approaches to achieve a wider comprehension of experiences of co-creation so that the companies can co-shape the expectations and experiences of consumer jointly (Prahalad and Ramaswamy, 2004).

Consumers presume an active character in VCC, and value is created in cooperation with the company (Kohler, Fueller, Matzler and Stieger, 2011) by indirect and direct participation through one or more consumption and production stages (Hoyer, Chandy, Dorotic, Krafft and Singh, 2010). More proximal attempts to involve consumers in the co-creation comprise active engagement in developing new products (Chien and Chen 2010), involvement in delivering the service (Auh, Bell, McLeod and Shih, 2007), engagement in service recovery (Dong, Evans and Zou, 2008) and content provider for online communities (Dholakia, Blazevic, Wiertz, Algesheimer, 2009).

(Prahalad and Ramaswamy, 2004) portrays the co-creation process through its essential building blocks which consist of dialogue, access, risk assessment, and transparency. This is known as the DART model of VCC. Combination of building blocks allows companies to engage their customers more effectively as collaborators. In figure 2, the DART model and the combinations of building blocks are portrayed.

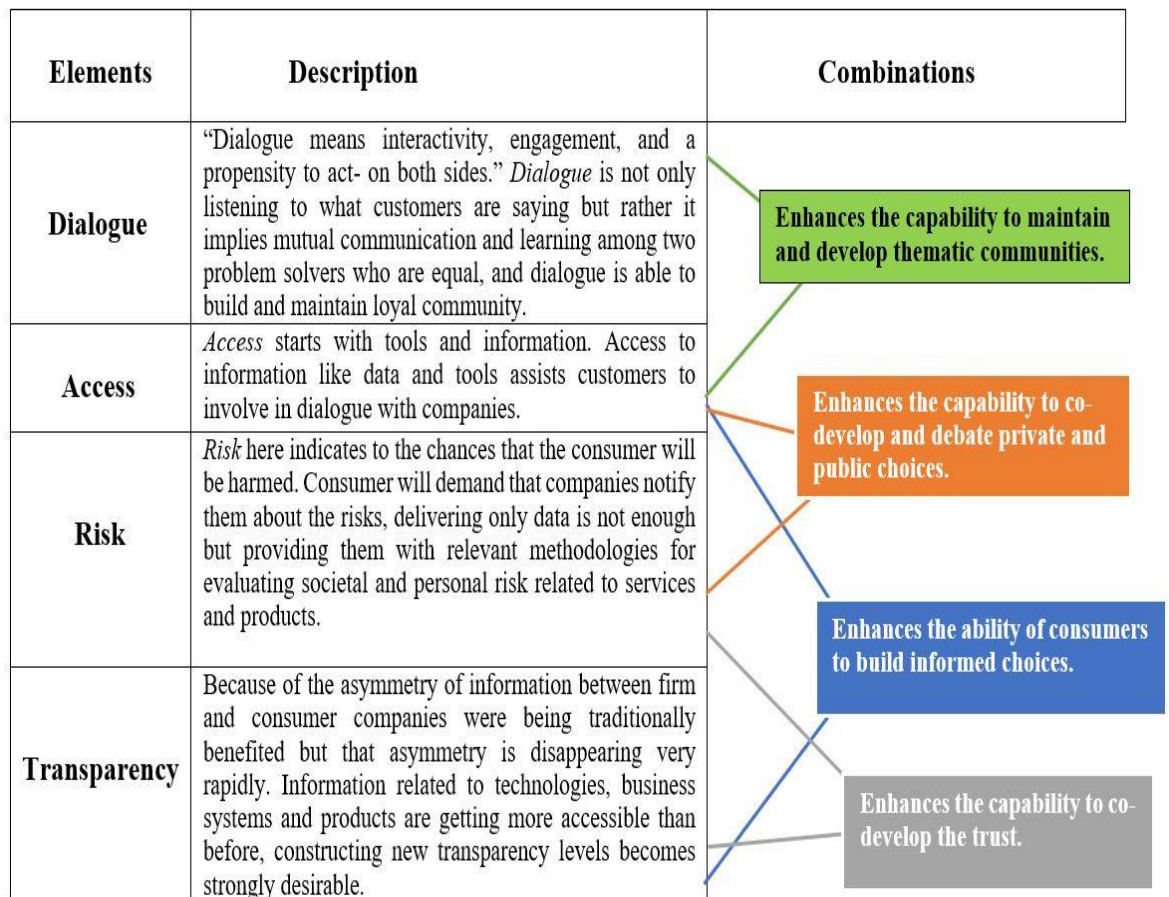


Figure 2. The DART model and combinations (Prahalad and Ramaswamy, 2004)

The process of value co-creation includes the supplier constructing better value positions, with their customers identifying value when a service or good is consumed. Providers present better value propositions and based on the evaluation of value customers make their choices (Payne, Storbacka and Frow, 2008).

4 VALUE PROPOSITION (VP)

Previously the researcher has discussed the prime aspects of value which will assist to understand the key topic of the study, value proposition. In this chapter, the researcher has exhibited the concept value proposition by defining it from different authors' context. Later the researcher penetrated the concept value proposition by discussing its types, process, framework in identifying the concept and finally the chapter ended by discussing important elements in identifying a healthy value proposition.

Anderson et al. (2006); Carter and Ejara, (2008) identifies that in current years the customer value proposition in business has turned into one of the most broadly used terms. Kaplan and Norton, (2001) (via Payne and Frow, 2014), considers value proposition as "the essence of strategy" whereas Webster, (2002, p. 61) (via Payne and Frow, 2014) argues that it "should be the firm's single most important organizing principle" (Payne and Frow, 2014). A literature review on customer value propositions portrays that, while the phrase VP is broadly used in academia and industry, only a very few numbers of literature take the concept into account in depth (Frow and Payne, 2011).

Numerous authors have presented the definitions of the value proposition from different perspectives. In the current chapter, the researcher is portraying the definitions of the value proposition from thirteen studies to construct comprehensive visibility in a way the phenomenon is recognized. The definitional table 3 aims to portray an idea about the confusion, similarities, arguments, and changes have taken place in the current business scenario. The purpose of presenting the definitions in this thesis indicates high ambiguity and absence of convergence regarding the phenomenon inside various literature.

Initially, Bower and Garda, (1985) (via Kowalkowski, Ridell, Rëndell and Sörhammar, 2012) discussed the concept of value proposition briefly and later Lanning and Michaels, (1988) introduced the concept where the significance of

delivering value in offerings is highlighted. Frow and Pane (2011) shares that VP was conceived as a process, that unifies systems and stakeholders.

Table 3. Variation of Value proposition definitions

Author	Definition
Lanning and Michaels (1988)	First defines the term value proposition, is the intention of the company to provide a statement of benefits and the price that the company will charge in relation to the benefits for each segment.
Kambil, Ginsberg & Bloch, (1996)	The value proposition is the relationship between the offering of a supplier (features of product or service performance) and fulfilling the certain needs across several customer roles.
Band, (2000)	In marketing value proposition is a classical idea which describes the relationship that takes place between the firm offerings and customer purchases through identifying the way firm meeting customer's need in various customer category.
Bagchi and Tulske (2000)	Value propositions are defined as benefits statement which is offered by the firm for its external constituencies (like customers).
Osterwalder and Pigneur (2003)	A value proposition is established on one or more abilities of a firm as well as portrays value for one or more Target Groups(s).
Kotler P. and Keller K. (2006)	The value proposition is interpreted as the bundle of benefits promised by the organization to be delivered to meet the needs of the

	consumer.
Ballantyne & Varey, (2006)	Value propositions are mutual value promises which are operated to and from customers and suppliers seeking a fair exchange.
Irvine, (2008)	Value propositions specify the interrelationship between meeting the needs and the performance characteristics of a service or product. Moreover, the value proposition strengthens the relationship between different aspects of value embedded in the product and the customer. Hence, the satisfaction of the customer is only a reaction to the value proposition delivered by a certain product/service.
Lindic & Silva (2011)	A value proposition explains in what way the offer of a firm differs from that of its competitors and why customers decide to buy from the firm.
Müller (2012)	Value proposition explains the way value is generated for customers and clarifies what sort of value is being delivered through services and products.
Barnes, Blake & Pinder, (2009, p.28)	Value proposition is a clear, captivating and acceptable picture of the customer's experience of the measurable value-creating offer of a supplier.
Payne and Frow, (2014)	The value proposition is an offering from organization to their customers, which represents the benefits of value promised for the customers which they are going to receive during usage and after the completion of the usage.

Osterwalder et al. (2014)	Value proposition defines the benefits of a firm's services and products that customer can expect
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4.1 Types of value proposition

Extensive research is carried out by Anderson et al. (2006) to identify the factor comprises a customer value proposition and in what way the value proposition could be shaped that would be compelling to customers. Anderson et al.'s (2006) study discovered that there are three alternative approaches of the value proposition (all benefits, favorable points of difference and resonating focus) out of which the supplier practices one of the approaches in their business. Table 4 portrays a holistic view of the three types of a value proposition.

Table 4. Types of Value proposition (adapted from Anderson et al., 2006)

Value proposition	Consists of	Answers the question of customer	Requires	Potential drawbacks
All Benefits	All the benefits of the offering are listed down which the supplier believes will be delivered to target customer	"Why should our firm purchase your offering?"	Knowledge regarding the offering of one's own market	<i>Benefit assertion</i> - Advantages for product or service features may be claimed by managers that literally does not bring benefit for the target customers
Favorable Points of Difference	Entire favorable points of difference of the offering to the market is considered in relation to the next best alternative	"Why should our firm purchase your offering instead of your competitor's?"	Knowledge regarding the offering of one's own market and next best alternative	<i>Value presumption</i> : Assuming that the favorable points of difference would generate value for the target customers
Resonating Focus	Value proposition based on resonating focus requires to be gold standard. It concentrates on one or two points of difference and possibly a point of parity, the improvement of which will provide the target customers with substantial value	"What is most worthwhile for our firm to keep in mind about your offering?"	Knowledge requires in what way the offering of one's own market provided higher value to customers in contrast to next best alternative	Research on customer value is required

(Anderson et al., 2006) in their research suggests that the suppliers who are practicing best, cater their value proposition on a small number of elements which generates superior value that is important to the target customers and it is communicated in a process that delivers a sophisticated comprehension of the business priorities of the customer.

4.2 Value proposition process

The value proposition process consists of three phases which incorporate input, process, and output which is depicted in figure 3. Value proposition statement including the set of value proposition messages which could be utilized for external and internal communications are two of the outputs of VPP. Offerings, benefits, cost and risk, customer experience, alternatives, and price are in the mechanism of the process to accomplish profitable growth, new and retained customers, enhanced offerings and corporate through to sales messaging (Barnes, Blake and Pinder, 2009, p. 22).

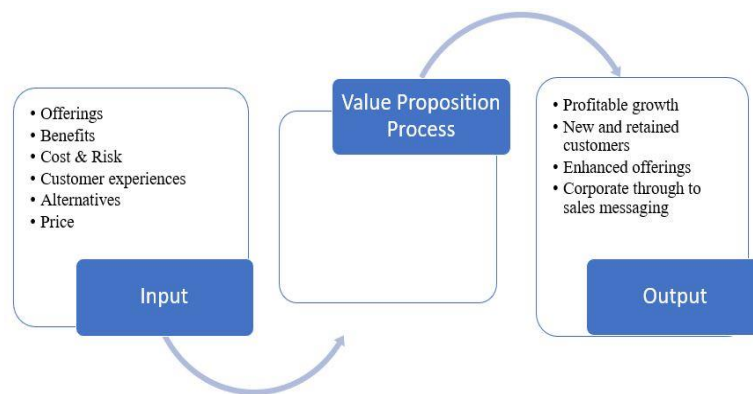


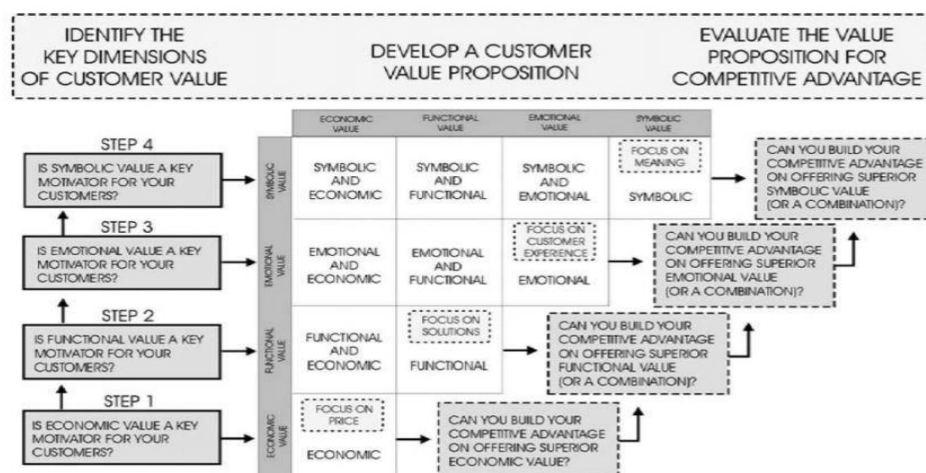
Figure 3. Value Proposition Process (adapted from Barnes et al. 2009, p. 22)

4.3 Framework for identifying customer value proposition (CVP)

Rintamäki et al.'s, (2007) constructed a framework for identifying the customer value proposition. The framework is being developed through the following process:

- Discovering CVP starts with comprehending the key aspects of customer value which is going to motivate targeted customers
- CVP development results from the hierarchical assessment and the combination of economic, functional, emotional and symbolic dimensions of customer value
- Evaluation of CVP's competitiveness is established on the appropriateness of the resources of the company and competencies are necessary for delivering the proposition in order to achieve competitive advantage

Figure 4. Framework for identifying customer value propositions (adapted from Rintamäki et al. 2007).



The dimensions of value in the framework illustrated in figure 4 are hierarchically arranged and combined to shape a value matrix of the customer. The dimensions of value range hierarchically from utilitarian to more hedonic and from objective to more subjective that starts from economic value, moving to functional value, then emotional value and ends at symbolic value. CVPs which reflect the utilitarian value are generated mostly by chopping down sacrifices like reducing price, saving time and effort of the customer. These dimensions are called “functional value” and “economic value”. Whereas CVP that reflects more subjective as well as abstract customer value deliver atmospheres to customers where senses are stimulated to convey their personality and these dimensions are named “symbolic value” and “emotional value” (Rintamäki et al. 2007).

According to Kandampully and Butler, (2001) a competitive CVP is more essential compared to the slogan of a brand and the concept is strategic which ties the perspectives of the company and the customer together for competitive advantage and value creation. CVPs must represent the total customer experience (Selden and MacMillan, 2006), and reduce the perceived risk of the customer by guaranteeing the promise of service (Kandampully and Butler, 2001).

4.4 Spotting successful value proposition

In understanding and applying the value proposition concept properly will safeguard the resources for a company by concentrating on ensuring viable opportunities, goals, and relationships. It ensures that the company deal fairly and openly with their customers and meet their needs in a way which also ensures the longevity of the business (Barnes et al. 2009, p. 26).

After Camlek, (2010) assessed several value propositions, it became understandable that all value propositions (VPs) are not created equally and many of these only dealt with statements of functions and features instead of fully shaped value statements. The language used to convey the message is a very important element that is essential for the successful value proposition. It is optimal if the value statements are positioned from the perspective of the customer in easy and simple understandable language. Detailed technical clarifications and complex equations may jeopardize the meaning of the message. Figure 5 assists to represent the value concept as it rises from basic function to true value of the customer during the journey up the value chain. The progress from basic utility towards a solution which adds the benefit of customer might be interpreted into real value statements.

Understanding Value from Utility to Advantage

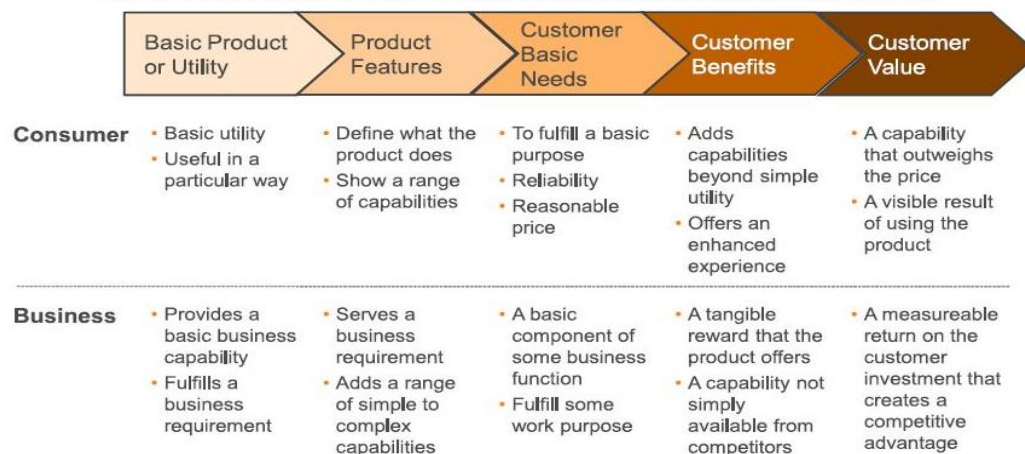


Figure 5. Understanding Value from Utility to Advantage (adapted from Camlek, 2010).

Treacy and Wiersema, (1993) identifies that companies who aimed at conveying superior value for customer practiced one of the three disciplines (operational excellence, customer intimacy or product leadership) of value and they become best in any one of the three disciplines whereas meeting up the industry standards for the other two value disciplines. *Operational excellence* means at a competitive price products or service are delivered to customers, the second discipline of value *customer intimacy* means the firm precisely target and segment market after that they tailor offerings to meet the demands of the niche market and the last value discipline is *product leadership* which means the companies deliver innovative offerings to market (Treacy and Wiersema, 1993). Camlek, (2010) points out that an outstanding VP should consider about the disciplines of value in which the target company operates. A checklist is shared by Camlek, (2010) presented in table 5 to identify if a value proposition is meeting up the mark.

Table 5. The checklist for identifying a proper value proposition (Adapted from Camlek, 2010).

Is it framed from the customer's perspective, instead of firm's perspective?
Is it superior? Would the value proposition, if delivered, surpass alternatives? Would customers agree?
Can firms deliver it? If not, could you build the capabilities needed?
Does it align with firm's strategy?
Is it sustainable? If so, for how long? How fast would competitors react? Would about other changes in the business environment?
Is it profitable to both the customer and firm?
Does it address the customer's pain points or areas of high interest?
Is it measurable?

(Lindic & Silva, 2011) claims that value proposition must finally aim to deliver distinct and focused benefits that assist to resolve problems of target customers by being measurable (based on points of difference that are tangible), sustainable (i.e. for a specific time period it is valid) and distinctive (i.e. better than the competitors).

Hence, the value proposition isn't it about the offerings or attributes of a company rather it is the experience of the customer regarding their wants and needs. Based on the formula ($\text{Value} = \text{Benefits} - \text{Costs}$), a specific company's value proposition is assessed by the customers. Value proposition consists of impact (i.e. in what way a company helps customer to succeed), capability (i.e. what can a company do for a customer) and costs (i.e. what is the exchange that a customer needs to go through for earning the privilege) (Barnes et al. 2009, pp. 28-29).

The PERFA tool by (Lindic & Silva, 2011) is constructed based on the customers who make the ultimate choices in the process of decision making and hence the value proposition is required to be analyzed from the perspective of the customer. After meticulously matching the effects of innovations on customers the authors discovered the PERFA model that consists of five elements which altogether portrays an entire analysis of value propositions of all customer created by innovations found in Amazon.com. The five elements of PERFA model are (P) for performance, (E) for ease of use, (R) for reliability, (F) for flexibility and (A) for effectively. The PERFA tool is explained with examples in table 6.

Table 6. The PERFA framework (Adapted from Lindic & Silva, 2011).

PERFA Framework	Definition	Example
Performance (P)	The approach through which organizations work with the motive to best serve their customers while making a profit.	<ul style="list-style-type: none"> • Alignment of customers expectations through product reviews • Product delivery through third-party sellers
Ease of use (E)	The extent to which people believe that using a specific product or service is effortless.	<ul style="list-style-type: none"> • “One click” purchase • User-friendly cloud computing service
Reliability (R)	The ability to deliver a product in accordance with its specifications.	<ul style="list-style-type: none"> • Shipping Platform • Installation
Flexibility (F)	The ability of firms to reconfigure and reallocate their organizational resources, strategies, and processes in response to changes in the environment.	<ul style="list-style-type: none"> • Sales of audio files in MP3 or CD
Affectivity (A)	Emotions or feelings related to a company an individual working or utilizing its services or product.	<ul style="list-style-type: none"> • Kindle • Leverage of the Amazon.com’s brand

Kambil et al. (1996) argue that the concept value proposition is imprecise for innovation, but Lindic & Silva, (2011) indicates that if the concept is methodically decomposed, it can be useful for innovation. The framework “PERFA” is constructed to assist the practitioners and academics in comprehending the function of a value proposition within the process of innovation (Lindic & Silva, 2011).

5 VALUE PROPOSITION IDENTIFYING PROCESS

Different aspects of value proposition were being discussed in the previous chapter and in the current chapter the researcher has led the discussion to an analysis of the tool, value proposition canvas (VPC). In the final chapter, I have studied different elements and important aspects of VPC and portrayed the process of using the tool to identify value proposition which is the focal point of this study.

Anderson et al.'s (2006) claim that properly constructed value proposition will drag companies to meticulously concentrate on their offerings if they are beneficial to their target customers. When companies are educated about comprehending customers, they will be able to make smarter decisions regarding allocating scarce resources of the company for building new offerings (Anderson et al., 2006). Value proposition canvas is one of the instruments that can be used to generate value propositions according to the customer's desire. According to Osterwalder et al.'s (2014, p. xiv) value proposition canvas creates value propositions tangible and visible and hence it is easier to manage and discuss. VPC perfectly fits with Business Model Canvas. For each customer segment, a different value proposition canvas is crafted (Osterwalder et al. 2014, p.24). Value proposition canvas consists of two parts, *customer profile* where the customer understandings are clarified and *value map* where a firm describes its value (Osterwalder, 2014, p. 3). *Fit* is also a part of the VPC which addresses the matches between a customer profile and value map (Osterwalder, 2014, p. 3). (Cova and Salle, 2007) claims that development went far where companies have moved from product offerings to products and services and finally providing solutions to customers. In this aspect, customers need to be aware of the firm's offerings and Pokorná, Pilar and Sergeeva, (2015) claim that the value proposition canvas portrays a clear picture of how a company is creating value for its customers.

In designing a value proposition canvas the prime method is, to begin with, the customer profile so that the target customer segment is revealed, and the actual desires of the target customers are recognized. Osterwalder et al.'s (2014, p. 43) state that "Your customers are the judge, jury, and executioner of your value proposition.

They will be merciless if you don't find it!", hence this is one of the other reasons to start with customer profile in building value proposition canvas. After the customer's jobs, pains and gains are identified then it would be wise to focus on the value map which deals with the pain relievers, gain creators and products and services feature which aim to eliminate problems of the customer and generate customer value (Osterwalder et al., 2014, pp. 8-9). The study is concentrating on the value proposition for the novel service which is the phenomenon of this research. Hence, the insight of the customer and value map is equally important to identify if the novel service is generating value to users.

5.1 Elements in Value Proposition Canvas

Value proposition canvas consists of two sides customer profile and value map. The researcher has discussed both the sides into details.

5.1.1 Customer profile

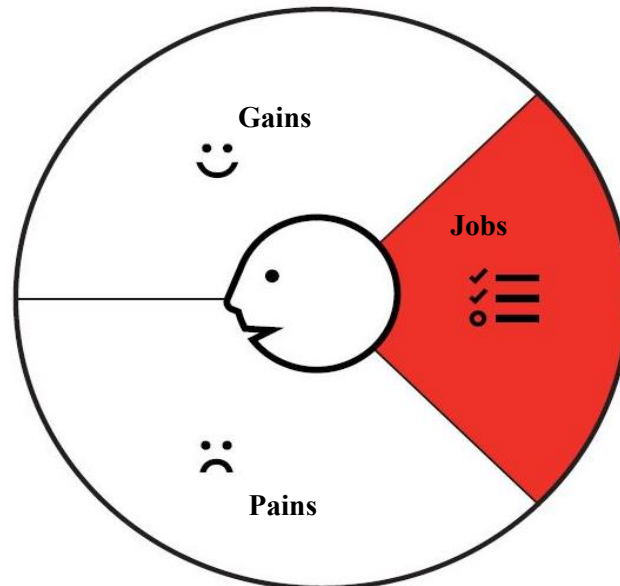


Figure 6. Customer Profile (adapted from Osterwalder et al. 2014: 13).

Customer Profile illustrated in figure 6 represents a definite customer segment of a firm's business model with a more detailed and structured picture. The customer

profile is for understanding a specific customer segment precisely and it is broken down into three parts jobs, pains, and gains (Osterwalder et al., 2014, p. 9).

Customer jobs

Customer jobs expose the things that the customers are trying to attain in their life or work. It can be the duties which customer try to carry out and fulfill, the needs they attempt to meet or the problems they attempt to solve. While investigating jobs it is required to take the customer's perspective because what we think is essential from our context which may not be the job a customer is trying to accomplish (Osterwalder et al., 2014, p. 12). In Customer jobs, the jobs segregates into four different types (functional jobs, social jobs, and emotional jobs and supporting jobs).

Functional jobs define when a customer is trying to accomplish or perform a certain task or resolve a certain problem (example appear professional at the workplace, in a professional attitude assist clients) (Osterwalder et al., 2014, p. 12).

Social jobs are when customers desire to obtain status or power or look good and these jobs define according to what customers want them to be perceived by other people (example look trendy) (Osterwalder et al., 2014, p. 12).

Emotional jobs are when customers want a specific state of emotion, like feeling good or feeling secured and this arrives from the customer preferences (job security in the workplace, peace of mind) (Osterwalder et al., 2014, p. 12).

Supporting Jobs are also performed by customer from the aspect of consuming and purchasing value either as professionals or as consumers. There are three types of supporting jobs *buyer of value* (jobs that are related to buying a product/ service value like comparing offers in the market, deciding which offer to purchase), *co-creator of value* (customer acting in the mechanism of co-creating value for an organization like posting reviews of product or giving feedback) and *transferrer of value* (jobs that are related to putting an end to the life cycle of value proposition like cancelling subscription) (Osterwalder et al., 2014, p. 12).

Supporting jobs related to co-creator of value also contributes in value creation through co-producer which is mentioned in the earlier chapter (Vargo and Lusch, 2004, pp. 10-11; Eiglier and Langeard, 1976; Grönroos, 1978 via Grönroos and Ravald, 2011). Moreover, the buyer of value portrays similar characteristics to “choice criteria” that is mentioned in the buying thought process of the customer by (Mullins et al., 2008, p. 10) in the earlier chapter.

Job importance

Osterwalder et al.'s (2014 p.13) claims that customer jobs usually depend on the context in which the customer already performed and certain restrictions or limitations may be imposed by the context (like going to a restaurant with office colleagues is different from visiting with a girlfriend). It is vital to recognize that all jobs do not have equal importance to the customers, so some jobs have more importance in a customer's life or work (Osterwalder et al., 2014, p. 13). Emotional or social jobs are sometimes more critical compared to functional jobs (Osterwalder et al., 2014, p. 24). A customer sometimes considers a job critical because it takes place frequently or it will lead to an unwanted or desired result (Osterwalder et al., 2014, p. 13).

Customer pains

Pain describes anything which makes customer getting annoyed before, during and after they try to do a job or just avert them from doing a job. Pains also explain risks, i.e. potential bad results, regarding finishing a job badly (Osterwalder et al., 2014, p. 14). Osterwalder et al. (2014, p. 14) identified that there are three types of customer pains.

Undesired outcomes, problems and characteristics- Pains are social (“I don't look good doing this”), emotional (“Each time I do this, I feel bad”), functional (e.g. a solution is not working or has negative adverse effects) or ancillary (“Going to store for a certain thing annoys me”). This can also involve unwanted attributes which customers don't appreciate (e.g. “The style of the suit doesn't look good”) (Osterwalder et al., 2014, p. 14).

Obstacles-The things that stop customers from starting a job or slowing them down (e.g. “Due to the solutions are expensive I can’t purchase it”) (Osterwalder et al., 2014, p. 14).

Risks (undesired potential outcomes)-The things or solutions that might go wrong and have significant negative effects (e.g. “The software for maintaining database would have security issues for the company”) (Osterwalder et al., 2014, p. 14).

Pain severity

Customer pain might be either moderate or extreme which is like how insignificant or important jobs can be for the customer. If it is understood that how customers exactly measure the pain severity, it would assist to design superior pain relievers in value proposition (Osterwalder et al., 2014: 14).

Customer gains

Gains are basically the results, benefits, and features that customers look for. They are consequences of jobs or desired features of a value proposition that assist customers to finish a job smoothly (Osterwalder et al., 2014, p. 18). There are some gains which are expected, desired or required by customers and some gains would surprise customers. Gains encompass social gains, cost savings, functional utility and positive emotions (Osterwalder et al., 2014, p. 16). In terms of benefits and outcomes, four types of customer gains are identified.

Required gains

In the absence of these gains a solution is not going to work (e.g. the most fundamental expectation a customer hold from a smartphone is to make a call) (Osterwalder et al., 2014, p. 16).

Expected gains

These are comparatively basic gains which customers expect from a solution, even in the absence of these gains it would work (e.g. customer is looking for the well-designed phone but even if the phone is not designed well it can make a call) (Osterwalder et al., 2014, p. 16).

Desired gains

These are the kind of gains which go beyond customer's expectations from a solution, but if they could, they would love to have them. Usually, these are the gains which customers would have if they were asked (e.g. Customers want smartphones that can be integrated flawlessly with other devices) (Osterwalder et al., 2014, p. 16).

Unexpected gains

These are the kind of gains which go beyond the desires and expectations of customers. If customers are asked about these gains, they won't be able to even think about them. (e.g. Nobody ever thought before about Apple bringing up App Store as a part of iPhone) (Osterwalder et al., 2014, p. 16).

Gain relevance

Gain can be in the degree between nice to have or essential, like pains that can feel moderate or extreme to customer. Like pains, it is better to define gains precisely as well and this would help to differentiate jobs, pains, and gains clearly from each other. If it is understood that how customers exactly measure the gains, it would assist to design superior gain creators in value proposition (Osterwalder et al., 2014, p. 16).

It is better to identify the pains and gains more precisely and tangibly (Osterwalder et al., 2014, p. 18) as this led to the understanding exactly how failures and success are measured by customers (Osterwalder et al., 2014, p. 24).

5.1.2 Value map

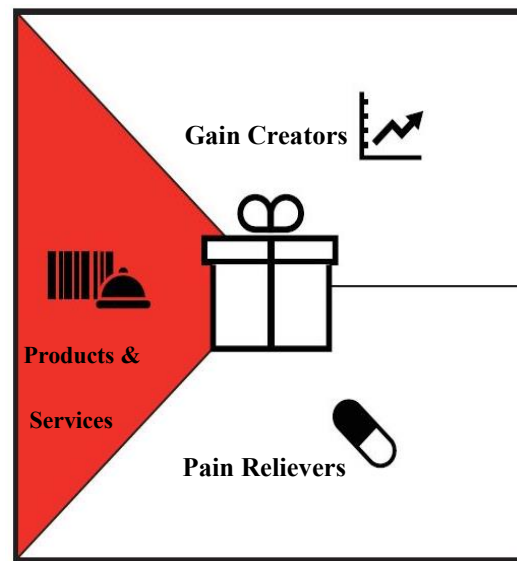


Figure 7. Value Map (adapted from Osterwalder et al. 2014, p. 28).

The Value Map/Value (Proposition) map is portrayed in a more detailed and structured manner of the attributes of a definite value proposition in a business model. The value map illustrated in figure 7 where the value proposition is broken down into pain relievers, gain creators and products and services (Osterwalder et al., 2014, p. 8).

Products and services

In this category, all the offerings of a company are enumerated. According to Osterwalder et al.'s (2014, p. 29) it is a list of the entire products and services on which a value proposition is based. The package of the company's offerings assists customers to fulfill either social, emotional or functional jobs or satisfy their basic needs (Osterwalder et al., 2014, p. 29). It is important to recognize that value is not created by solely products and services, but the value is created in relation to a certain segment of the customer and their pains, gains, and jobs (Osterwalder et al., 2014, p. 29). (Keränen and Jalkala, 2013) also shared a similar view which is discussed earlier.

Different kinds of products and services are likely to comprise in a value proposition like physical/tangible (goods like manufactured products), intangible (copyright products or services like after-sales support), digital (services like online recommendations or products like music downloads) and financial (services like assisting in financing a purchase or products like insurances and investment funds). All the products and services do not contain the same importance to customers, as a result, some are essential to the value proposition and some are simply nice to have (Osterwalder et al., 2014, p. 29).

Pain relievers

Pain Relievers define how services and products precisely alleviate the pain of a specific customer. They specifically describe how a company aims to reduce or eliminate some of the items that customers are annoyed with during, after or before they try to get a job done or that impede them from doing the job. Good value propositions concentrate on pains which matters to the customer. For every pain which is figured out in the customer profile do not need to have a pain reliever and this cannot be done by any value proposition. Good value propositions usually concentrate on only a few pains that are extremely well alleviated. The customer may find a pain reliever that could be more or less important. Hence, it requires to distinguish the pain relievers that are nice to have and the ones that are essential (Osterwalder et al., 2014, p. 31).

Gain creators

Gain creators define how customer benefits are created by a company's products and services. They explicitly explain how a company aims to produce benefits and outcomes according to a specific group of customer desires, wants or get surprised to see, including social gains, functional utility, cost savings and positive emotions. As like pain relievers, each gain in the customer profile identified need not to be addressed by gain creators. Hence, it is wise to focus on customer-relevant services and products that can create a difference and gain creators requires to be

differentiated in the scale between nice to have and essential (Osterwalder et al., 2014, p. 33).

5.1.3 Fit

Osterwalder et al.'s (2014, p. 42) claim that a fit is achieved when customers are excited about a company's value proposition, that takes place when a company addresses important jobs, relieve intense pains and generate necessary gains that customers are interested in. The core of value proposition design is making great effort to achieve fit around services and products of a company and it is difficult to discover and maintain (Osterwalder et al., 2014, p. 42). The most important necessity for an effective value proposition is the fit between the company's offerings and what customers desire (Osterwalder et al., 2014, p. 48).

Fit takes place in three phases, problem-solution fit, product-market fit, and business model fit. Problem-solution fit occurs when the company has evidence that the target customers care regarding specific pains, gains, and jobs that are addressed by the company's value proposition. Companies at this phase still have no evidence that their customers really care about their value proposition because the fit which is achieved in this phase is still not proven and mainly exists on paper. Product-market fit takes place when companies have evidence that the pain relievers, gain creators and product and services generate customer value and getting market traction. In the second stage, companies seek to invalidate or validate the assumptions of the value proposition. Many of the prior ideas merely do not generate value for a customer which means customer do not care for the value offered and because of this new value propositions need to be designed. Business model fit occurs when companies have evidence that their value proposition can be incorporated into a scalable and profitable business model (Osterwalder et al., 2014, p. 48).

5.2 Unboxing the mechanism

Mapping a value proposition defines, that the pain relievers, gain creators and products and services of a company are crafted on the ground of the customer profile.

Figure 8 depicts the mechanism and explain in what way the mapping of the value proposition is carried out. The value proposition mapping takes place in three phases, starting with phase (1) *customer profile* where a specific customer segment is selected and based on the customer segment all the customer jobs, pains and gains are listed. Then moving into phase (2) *value map* where all the products and services are listed on which the value proposition is built on and pain relievers and gain creators are also outlined. It is constructed in a manner that each of the parts of the value map addresses its pair in the customer profile (e.g. products and services referring to customer jobs, gain creators referring to gains and pain relievers referring to pains). The last phase (3) *fit* aims to achieve a match between the pairs of value map and customer profile. The products and services, pain relievers and gain creators cannot match or fit all the jobs, pains and gains in the customer profile. No value proposition can solve all the desires of the customer identified in the customer profile. It is also important to rank the degree of importance of the elements in value map and customer profile because all the elements identified does not carry the same importance and this issue is also explained in the previous paragraphs (Osterwalder et al., 2014, pp. 12-42).

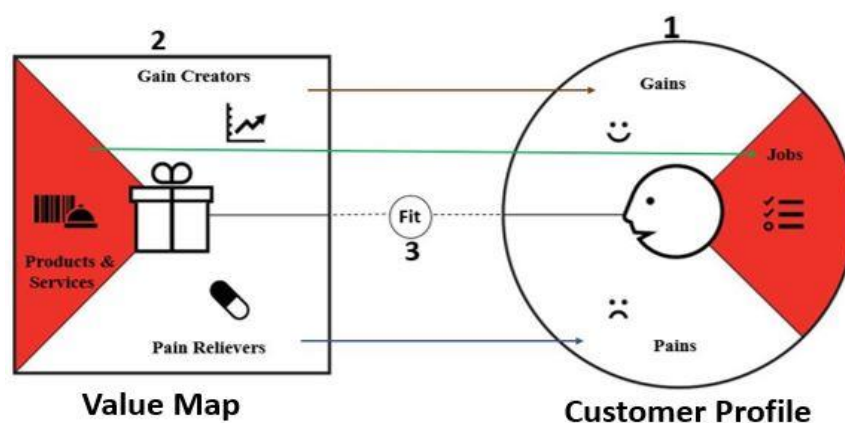


Figure 8 The mechanism operating the value proposition canvas (adapted from Osterwalder et al., 2014, pp. 12-42).

One vital thing in designing value proposition is to rank the degree of importance of the elements in value map and customer profile because all the elements identified does not carry the same importance and this issue is also brought up in the previous chapters. The priorities of the customer are to be precisely identified in designing products and services, gain creators and pain relievers. It enables to create a value proposition, that portrays the benefits clearly and captivates new customers

(Anderson et al., 2006). It is tough to identify the factors which are important to customers but stepping into the customer shoes will assist to visualize the factors that matter to the customers (Osterwalder et al., 2014, pp. 20-22). Ranking the factors in value proposition will bring out specific factors like resonating focus mentioned by Anderson et al. (2006) earlier. The preferences vary from customers to customers, so it is required to investigate the main objectives of the customer for designing value propositions (Osterwalder et al., 2014, p. 20).

5.3 Value proposition identifying process and canvas

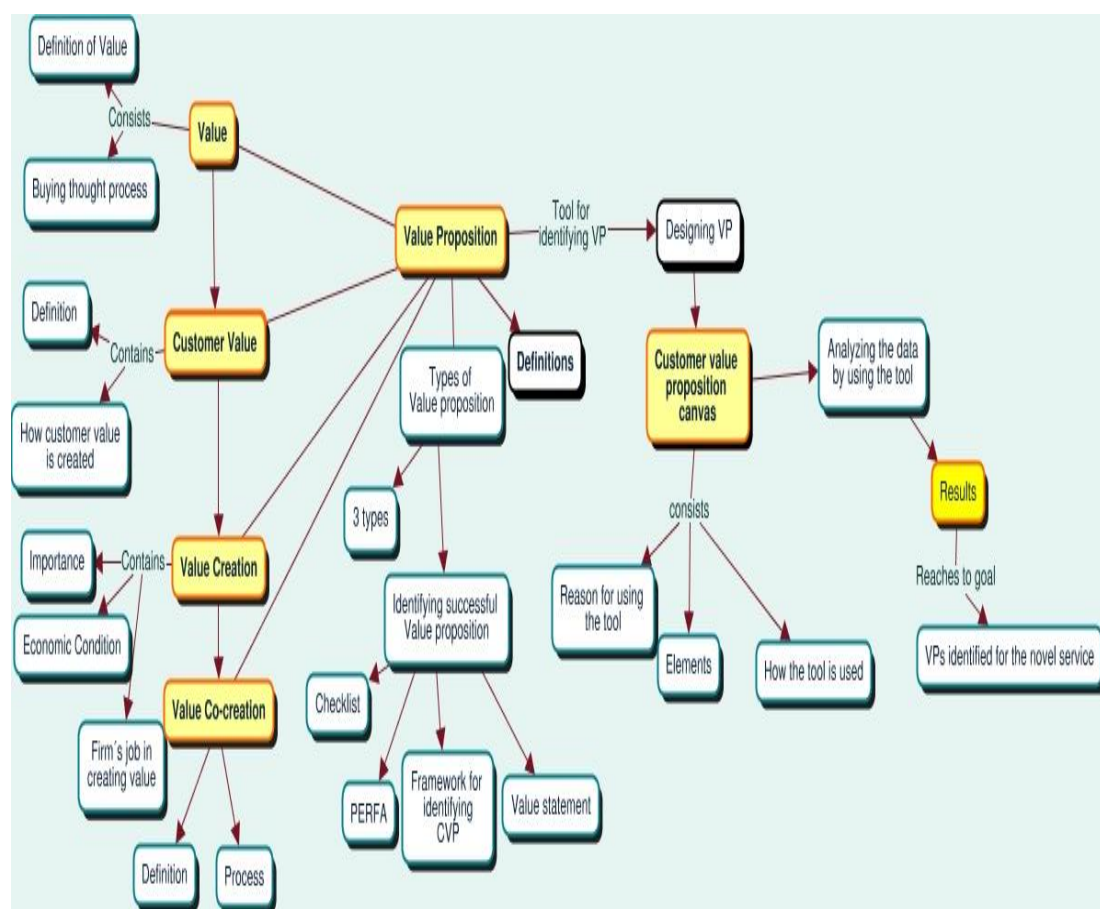


Figure 9 Value proposition identifying process.

The theoretical framework portrayed in figure 9 is constructed based on the discussions of various literature from different authors. The theoretical framework of this study portrays the journey towards value identifying process. The key concept for this study is the value proposition and all the discussions in the theoretical section

is aimed to create a relation in identifying the value proposition. The ontology of value has led the study to value proposition discussions. The value proposition is then discussed from a wider aspect where different elements of the value proposition are portrayed. Discussion on value proposition created a strong ground that unlocked the tool through which value proposition is designed in his research.

Value proposition canvas is the tool in this research which is used to identify the value proposition for the novel sensor based indoor air quality improvement service. Value proposition canvas is discussed thoroughly from different dimensions which led the researcher to move into the empirical part for diagnosing the value proposition of the novel service. The theoretical framework also provides an idea of the empirical section (analyzing and outcome) only to portray the flow of the research.

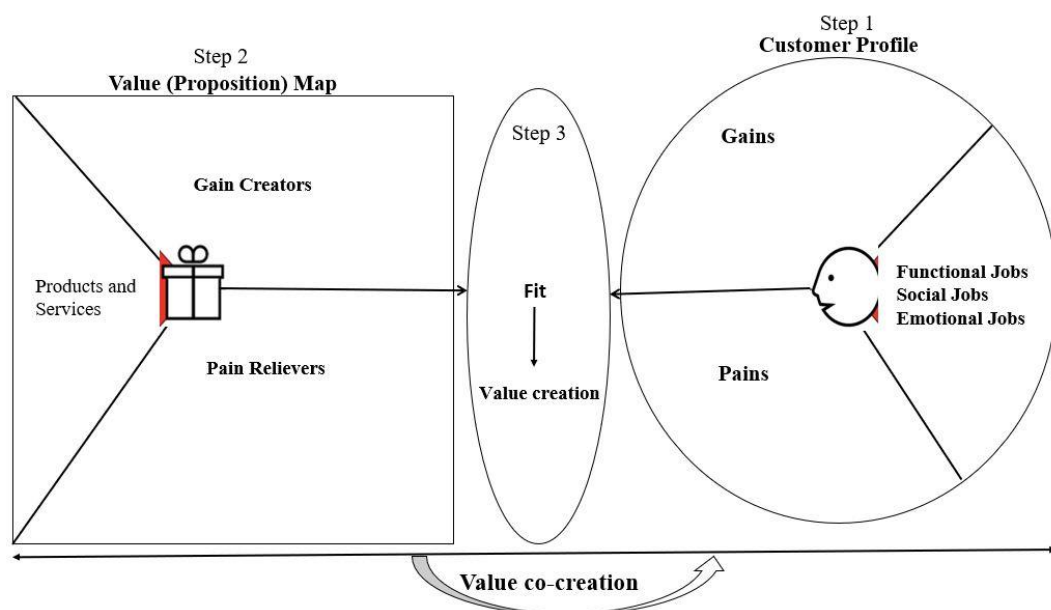


Figure 10. The conceptual model: value proposition identifying canvas (modified and extended from ‘value proposition canvas’ by Osterwalder et al., 2014, pp. 12-42).

The conceptual model is developed to identify the value proposition for the novel service. The conceptual model in figure 10 is configured with value creation and value co-creation. The case company and stakeholders jointly constructed the value proposition for teachers. In step 1 the teachers were being profiled as customer and stakeholders developed the customer profile from the perspective of a teacher. In step 2, “products and services” are being filled by case company with their novel features.

The rest of the segments of value map is filled by stakeholders. Finally, in step 3 the “fit” takes place where the value proposition of the novel service addresses the requirements of the teacher. In between the value map and customer profile through “fit” value is created for the customer. In “value creation” the requirements of teacher will be entered which are specifically addressed by the value proposition. This portrays in this segment the value is created for teachers by addressing their requirements.

6 RESEARCH DESIGN

In this chapter, the methodology chose for this thesis is discussed. Initially, an introduction of the case company and the project of the company is briefly discussed. Furthermore, an overview of the novel service designed by the case company is portrayed. Finally, the source of the data and data analysis process is discussed in detail.

6.1 Case company

In this study, the case company is VTT Technological Research Centre of Finland Ltd, a Finnish technical research institute. VTT provides international and national customers and partners with research and innovation services and information.

VTT is currently working in of the novel projects ESTABLISH (Environmental Sensing to Act for a Better Quality of Life: Smart Health) which aims to change data from environmental sensors toward actionable information to deliver a safer and healthier environment for the users to improve the quality of their life. ESTABLISH project consists of partners from twenty companies and seven countries which are Finland, Spain, Turkey, Romania, Portugal, Republic of Korea and the Czech Republic. The main implementation area of ESTABLISH project is delivering services, solution, and products on a personal level by utilizing the environmental sensors and blending the environmental input with other sources of data, such as data from weather conditions and individual data through wearable sensors. ESTABLISH will allow monitoring the outdoor and indoor environments and traffic conditions to manage the environmental conditions on an individual level which intends to improve the quality of life by reducing the cost for health and assisting vulnerable groups (elder people, patients, children) (ESTABLISH, 2019).

To demonstrate the solutions to ESTABLISH project it includes three uses cases: optimized city and mobility planning, developing smart HVAC systems that ensure a healthy indoor environment and promoting the independence of specific vulnerable groups. The use cases are developed further and tested in six pilots. Moreover, the

use cases and pilots have a common ground between them and due to this, it is categorized into two concepts indoor and outdoor which are depicted in figure 11.

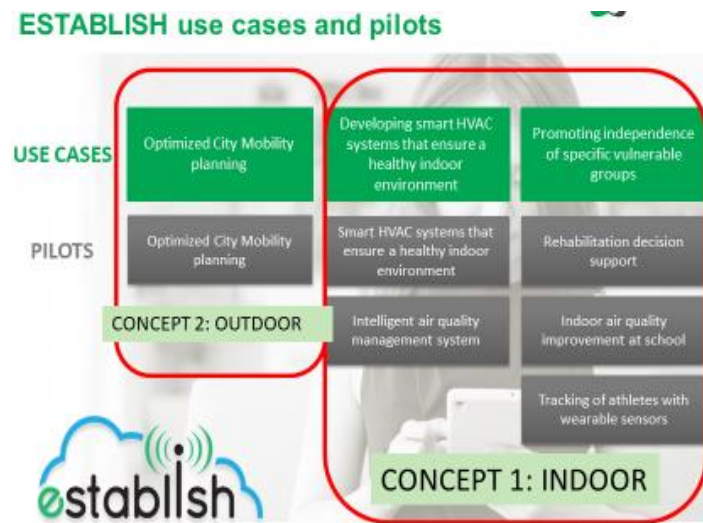


Figure 11. ESTABLISH use cases and pilots.

In this thesis, the study focuses on concept 1: indoor, use case, promoting the independence of specific vulnerable groups and pilot: indoor air quality improvement at school and VTT is the owner of the pilot which will be studied. Currently, as VTT developed a novel service and trying to make it available in the market, the value proposition will be identified based on this novel service.

The Finnish pilot, *Indoor air quality improvement at school* aims to study the utilization of different indoor sensors and wearables merged with personal feedback from users and information on environmental sensing to ensure a healthy living environment for teachers, staff members at school and pupil. Users can receive individualized recommendations based on the data measured and user feedback on the air quality impact. The operation of the pilot discussed is portrayed in figure 12 (ESTABLISH D2.2, 2017).

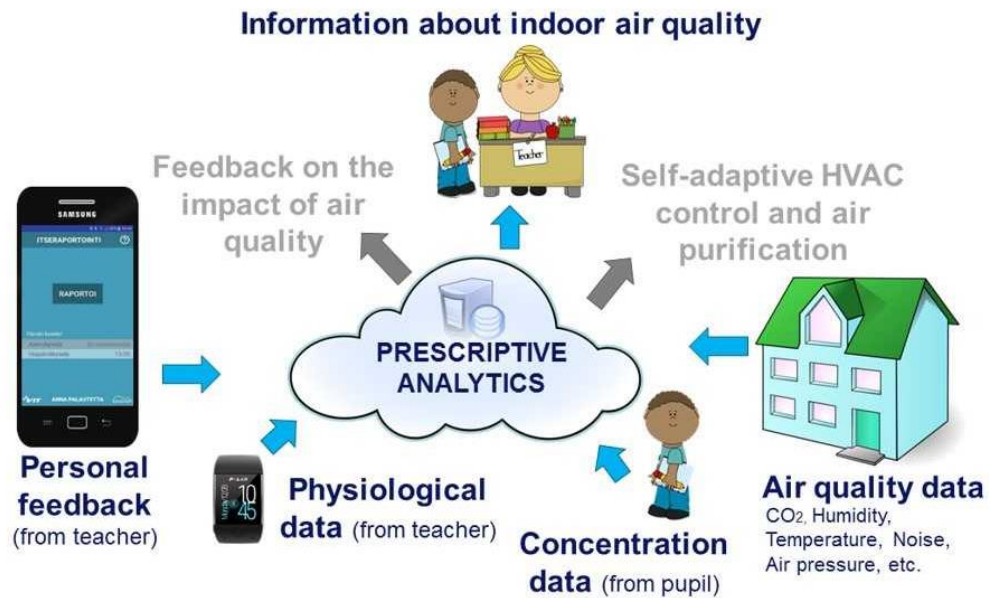


Figure 12. Concept of the IAQ improvement at school (adapted from ESTABLISH D2.2, 2017).

The novel service will create a wider area for new products and services which are related to environmental sensors. Hence, the ESTABLISH project is likely to generate opportunities for service providers such as companies that are related facility management, health organization, sensor manufactures, HVAC manufacturers, companies related to health insurance and software developers (ESTABLISH D2.2, 2017).

It is mentioned earlier the study is going to concentrate on the novel service, IAQ improvement at school. The aim of the study signifies the process of identifying the value proposition for the novel service. Since the case company is looking forward to turning the theoretical concept into practical implementation through making it available in the market. As a result, stakeholders' perspective is essential at this stage because without knowing if the value is created out of the innovation, it is not likely to generate interest among stakeholders to investment for the novel service. At this level, the idea of value proposition canvas is brought up to identify whether the novel concept is creating value by solving problems and bringing benefits for the user. It is mentioned earlier that it is a crucial job to create value for customers, especially while developing new services or products (Smith and Colgate 2007).

6.2 Methodology

According to Golafshani, (2003) qualitative research utilizes naturalistic approach which aims to comprehend situations in “context-specific settings”. In this thesis the data are not numerical rather it is generated from a real-life setting. Hence, this thesis follows the nature of qualitative research. The researcher chose to apply the case study method for this thesis. Case study research method is an empirical inquiry which examines a current phenomenon surrounding real-life context, “when the boundaries between phenomenon and the context are not clearly evident” (Yan, 1984 via Zainal, 2007). Case studies focus on analyzing certain issues within the limits of a specific situation, organization or environment (Zainal, 2007). In this thesis the case company has provided a case study that focuses on a certain subject “value proposition” and the whole study of the thesis encompasses a specific situation “novel air quality improvement service”. In most of the cases, a small number of people or a limited geographical area is chosen as subjects in the case study method of research (Zainal, 2007). In a case study research the study focuses on answering “why” and “how” questions (Yin, 2003 via Baxter and Jack, 2008). In this thesis, the main research question is *“How can the value proposition for this type of novel technology-based service be identified?”*. As a result, the main research question in this thesis agrees with the nature of the case study research.

Case study research is categorized as explanatory, descriptive and exploratory. In explanatory case studies, the data is closely examined at a deep and surface level for explaining the phenomena within the data. Based on the data, the theory is formed and tested by the researcher. Moreover, in the case of causal studies, explanatory case study method is also used to scrutinize certain phenomena in multivariate and very complex cases. Descriptive case studies are designed to explain natural phenomena that take place inside the data in question. The goal of the researcher is to give a detailed explanation of the data. In order to assist the description of the phenomena, the researcher is required to start with a descriptive theory. Exploratory case studies are designed to find out any phenomena within the data that serves the researcher’s center of interest. It is considered that pilot study is an example of an exploratory case study (Yan, 1984 via Zainal, 2007).

The categories of explanatory cases studies can be stated in keyword where explanatory means explain, descriptive means describe, and exploratory means to explore. Based on the facts and distinction among the categories of case study research it can be concluded that this thesis is based on exploratory case study as it serves the researcher's point of interest in exploring the phenomenon within the data.

A deductive research approach is followed for this thesis as it corresponds with the purpose of this study and the choice made for methodology. Hyde, (2000) claims that a deductive approach is a process of the testing theory that begins with established theory and then moves into the empirical part to identify whether the theory can be applied for the specific context. In a nutshell, the deductive research approach is moving from theory to data to meet the researcher's objective. In this study to meet the objective of the research, theoretical section is developed in the beginning and then based on the theory the data is studied to figure out if the theory is meeting the goal of the research. In qualitative research, using the deductive approach can be a key step towards making sure that the findings of qualitative research are convincing (Hyde, 2000).

6.3 Data gathering

In this research, the case company intends to identify the value proposition of novel service in order to captivate various stakeholders. The respondents of this thesis were stakeholders whose backgrounds are related to smart & clean solutions, construction and renovation planning, property evaluation consultant, health institute, hospital doctor, university associate professor, renovations, property technologies, tracking and managing living conditions, ventilation solutions, facility owner and renter, facility managers, ventilation equipment manufacturer. A total number of twenty-three participants were being interviewed for collecting the data.

According to Zainal, (2007) the method of case study allows a researcher to examine the data closely within a well-defined context. Feagin et al. (1991, p. 2) argue that case study is conducted in a detail manner and usually rely on different kind of data sources. Given, (2008) states that to collect relevant and specific data in relation to

the research topic it is suitable to gather raw data. In this research data are collected based on the sub-research questions to find the answer to the main research question. In this research, two different techniques have been used to collect data from Finland and the Czech Republic. The techniques that have been used for collecting data are semi-structured interviews and focus group interview.

The identical process is followed by the case company for collecting the data for both semi-structured interviews and focus group interview. Initially, the ESTABLISH project was presented briefly to the respondents but the solution of the ESTABLISH project was not disclosed. In the second phase, a presentation was given on value-driven design where value, value proposition and value proposition canvas were being discussed. In the third phase, the objective of gathering data was discussed where it was mentioned that the aim of gathering data is to develop novel air quality related service concepts for three pre-selected groups (citizen, teacher and facility owner). However, in this research, the researcher is only concentrating on the teacher segment as this thesis is on indoor air quality improvement service at school. The interviewers defined teachers as the people working at schools with the different age group of children. In the fourth phase, the value proposition canvas was kept open and the interviewees were asked to share their view about pains, gains, and jobs of the teacher. The fourth phase focused on gathering data for the customer profile of the value proposition canvas. In the fifth phase ESTABLISH project was being presented again but in a broader aspect where the ESTABLISH solutions were being presented (ESTABLISH solutions is counted as the product in the value proposition canvas). In the sixth phase, the value proposition canvas is opened again, and the interviewees were asked to share their view about gain creators and pains relievers. The sixth phase concentrated on filling the value map of the value proposition canvas. Finally, the new service ideas were shortly discussed.

6.3.1 Semi-structured interview

In gathering the responses from interviews semi-structured interview pattern is followed. The semi-structured interview consists of verbal interchange between the interviewer and the interviewee where interviewer have predetermined questions that

provide the participants to explore issues which they think important (Clifford, Cope, Gillespie and French, 2016, p. 143). Semi-structured interviews are open that allow participants to share new ideas during the interview and usually, the interviewer carries a framework of a subject that needs to be explored. According to Miles and Gilbert, (2005) semi-structured interviews provide a versatile way of gathering data that creates a comprehensive understanding of the research questions. In this research semi-structured interview is conducted through face to face interview and Skype interview.

In table 7 and 8, the data gathered through face to face interview and Skype interview is presented in detail. There was twelve face to face interviews and Skype interviews from Finland and the Czech Republic.

Table 7. Face to face interview.

Type of Interview	Stakeholders	Participants	Time required	Origin of data
Face to Face Interview	Smart & clean solutions	1	90 mins	Finland
	Construction and renovation planning	2	90 mins	
	Facility owner	2	90 mins	
	Property evaluation consultant	2	90 mins	
	Health institute	1	60 mins	Czech Republic
	Hospital doctor	1	60 mins	
	University associate professor	3	90 mins	

Table 8. Skype interview.

Type of Interview	Stakeholders	Participants	Time required	Origin of data
Skype	Renovations	1	60 mins	Finland
	Facility owner	1		
	Property technologies	1		
	Tracking and managing living conditions	1		
	Ventilation solutions	1		
	Facility owner and renter	1		

6.3.2 Focus group interview

Focus group interview is a data gathering process among a few people where data is gathered through informal discussion based on a certain topic (Silverman, 2004, p. 177). According to Rabiee, (2004) focus group strategy is capable to generate large-scale data within a short period of time. In a focus group interview, there is a presence of a moderator or facilitator whose task is to keep the group discussion on the certain topic or else the discussion might lose the track of focused topic (Valentine and Clifford, 2003, p. 105). Smaller group size contributes higher potentiality so a group size between six-eight participants is suggested (Krueger and Casey, 2000 via Rabiee, 2004). The details of the focus group discussion conducted in this research are presented in table 9.

Table 9. Focus group interview.

Type of Interview	Stakeholders	Participants	Time required	Origin of data
Focus group	Health institute	1	90 mins	Czech Republic
	Facility managers	2		
	Ventilation equipment manufacturer	2		

Determining participants for focus group interviews and semi-structured interviews are essential so more often interviewees are chosen based on their experience related to the topic of the research (Valentine and Clifford, 2003, p. 108). In this thesis study 'purposive sampling' technique is applied. According to Tongco, (2007) purposive sampling is also known as judgment sampling, and the technique is applied when a researcher determines what needs to be explored and start to identify people based on their knowledge and expertise. In this thesis, the samples were identified related to their knowledge about indoor air quality and expertise in indoor air quality improvement service. Since the specified knowledge and expertise were required by the researcher to achieve in-depth answers from the sub-research questions.

6.4 Data analysis process

Data analysis is one of the key elements in this research because based on the analysis the output will be discovered that will determine the value proposition for the novel service. In this research, data analysis is conducted through multiple phases. Robson, (1993) stated that the main objective of the data analysis is reducing data. The data reduction process includes coding then the coded data is being categorized under each theme and finally the gathered data is summarized. Yin, (1989) discussed that data analysis comprises several stages like *reviewing* the data that leads to *categorizing* data and lastly *tabulating* or the evidence is recombined to address the initial objective of the study. Categories are related to the phenomenon of research interest. Categorizing the data assist to organize, explain and summarize the phenomenon in a pertinent way considering the problem of the research.

Initially, the data from the focus group discussion was conducted by the case company in relation to the research questions forwarded to them earlier. The case company later made the initial coding, categorized the data in relation to the theme of the research questions, translated the data into English finally the data was forwarded in an excel sheet. The excel sheet that consists of data forwarded by the case company is attached in Appendix 1. The data analysis is further carried out in three phases. The phases are a systematic chained process for analyzing the data and in each of the phases the data were filtrated, and nodes are created. The data analysis is

conducted for two different aspects firstly the analysis is done for customer profile and secondly, it is done for the value map.

Phase 1: In the first phase the data analysis for customer profile is brought up into account. The customer profile consists of customer jobs, pains, and gains. Initially, the data is being viewed properly and understood clearly. Under the theme of customer jobs, the data is categorized into three different aspects: functional jobs, social jobs, and emotional jobs. Based on the theoretical understandings the data is categorized in customer jobs.

Phase 2: In the second phase the data filtration process is carried out, that basically aims data reduction. In this phase, different nodes are created for the customer profile which is done by finding out repetitive responses, the responses that create a similar idea and for the responses that appeared only once. In an excel sheet, the nodes in relation to the responses are analyzed and tabulated. Each node is viewed three times to check if every time the same result is generated and lastly the nodes for customer profile is tabulated.

Phase 3: In the third phase the data generated related to value map is brought into account for the first time. In analyzing the data for value map, the focus was given to the data set of “Pain Relievers” and “Gain Creators”. Initially, the data is being viewed properly and understood clearly. The data filtration process is also carried out in this phase and nodes are created. The nodes are created in a similar pattern done for customer profile by finding out repetitive responses, the responses that create a similar idea and for the responses that appeared only once. In an excel sheet, the nodes in relation to the responses are analyzed and tabulated. Each node is viewed three times to check if every time the same result is generated and lastly the nodes for customer profile is tabulated.

Phase 4: This is the final phase of the data analysis process where the nodes are placed in the value proposition canvas (customer profile and value map). In relation to the theory and the research questions, the value proposition canvas is filled up and the final output is achieved that addresses the initial objective of the study. Value

proposition canvas as a tool assists to identify the value proposition for this type of novel technology-based service.

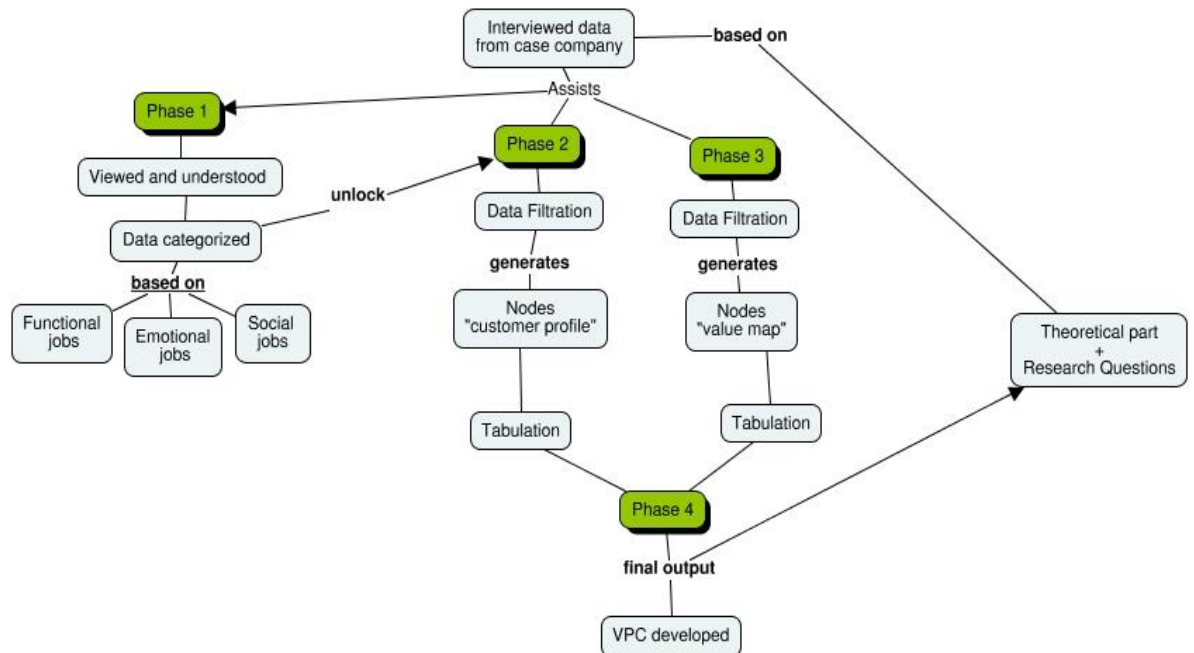


Figure 13. Data analysis process.

Figure 13 provides the scenario of the data analysis process in this study. The analysis is focused on the user, but several stakeholders are brought up in this case to share their view from the aspect of the specific customer segment. The key area of this data analysis is to identify whether the value proposition can be identified for the novel sensor-based IAQ improvement service.

7 RESEARCH FINDINGS

In this chapter, the results from the stakeholders' interviews will be discussed for the specific customer segment, in order to identify the elements required to construct the value proposition canvas for the case company. The findings are being discussed from the perspective of customer profile and value map for generating the value proposition of the novel service. Hence, the outcome of the tool is the key aim of this research. Information in this chapter is derived from stakeholder interviews provided by the case company.

All the data interviewed in this research is focused on one customer segment, so a single value proposition canvas is developed based on the analysis as Osterwalder et al.'s (2014, p. 3) recommended that a single value proposition canvas is required to be designed for each customer segment. It is mentioned earlier the data is gathered from two countries but during analysis, the entire data set is configured as one data set because significant differences are not observed between different countries. The stakeholders interviewed in this research were chosen from different industries in order to achieve a comprehensive and reliable data collection. The name of the respondents' company, name and designation are not disclosed in this thesis, so it is not possible to identify a respondent responsible for a specific answer. As the detailed information is not revealed in the thesis it provides the ground of unbiased data analysis. In this research, the data is being gathered both for customer profile and value map. In the value proposition canvas, teachers were being profiled in the customer profile and stakeholders stepped into customer shoes to identify different jobs, pains, and gains of the customer.

In this chapter, the first section is based on information, that focuses on the reader to make them familiar with findings from the interview. In the second section, the focus is on data interpretation that encompasses the research phenomenon. Already the customer segment and the industry of stakeholders for this research is discussed since the interviews from stakeholders are the data source for developing the value proposition canvas for the case company. The data interpretation is divided into two

parts initially the customer profile's findings will be discussed and later the findings related to value map will be discussed.

According to Osterwalder et al. (2014, pp. 12-39) the customer profile of value proposition canvas is being constructed based on the responses from the predetermined customer segment. In this study the customer segment is teacher, but the responses were gathered from various stakeholders. The teacher was chosen as the segment of the study because the case company is developing the novel indoor air quality improvement service for school. The stakeholders were being the respondents for gathering data because the case company intends to identify the value proposition for the novel service that would later assist them to attract different stakeholders in order to turn the concept into reality. During the interview sessions, the stakeholders were being asked to response from the aspect of teachers.

The value map is filled by the firm with their products and services that create value for customers Osterwalder et al. (2014:36). However, in this thesis, the value map is not filled up by the case company rather than it is also being developed from the stakeholders' response.

7.1.1 Findings

The aim of the empirical part of the research is to discuss the findings gathered from primary research that would create a base for further analysis. In this section, the researcher discusses finding based on the answers collected from the following formulated sub-research questions "What are the value images for the novel service?", What are the things that will be gained using the novel service?" and What are the pains that will be relieved using the novel service?". The first question is formulated to construct the customer profile, and the last two questions are formulated to build the value map. Based on the questions the findings will be discussed separately for customer profile and value map. All the stakeholders' interviews are being transcribed by the case company. The main themes in respect to the sub-questions are translated in English and forwarded in keywords.

7.1.2 The value images (customer profile)

The elements in customer profile consist of jobs, pains and gains and the term “value images” describes those elements of customer profile. The first sub-research question aimed to identify the jobs, pains, and gains for the teacher. It is revealed from the findings that there are many types of customer jobs, pains and gains encompass the customer. In order to find the answers for customer profile, the findings of jobs, pains, and gains are discussed separately.

Customer jobs

The respondents answered that the jobs for the teacher are teaching children, develop children’s knowledge, raising children, gain good learning results, raising enthusiasm and curiosity among children, preparation (own competence), show the pupils the possibilities, attitude, and opinion editing, to shape the children’s personality and create a safe environment for the people. There were around 44 responses in relation to customer jobs. The similar type of responses from the stakeholders is discussed above.

The findings from the customer jobs surrounded the role of a teacher in the workplace. The job of the teacher mostly focused on educating children for the future by developing children’s knowledge in multiple subjects.

“preparation (own competence)”

Respondents mentioned that the children’s work needs to be evaluated by the teacher to figure out their academic progress. In order to maintain the academic function, the teacher needs to provide children to need a healthy and safe environment.

“keep children safe and healthy”

“create safe environment for the pupils”

In developing children's knowledge, the teacher requires to increase enthusiasm and curiosity among the children in the classroom. Hence, the teacher needs to work on their own competency level for a good outcome from the students.

“Raising enthusiasm and curiosity”

There were responses from stakeholders which appeared only once such as utilizing the latest teaching methods, collaborate with parents and contact point for parents. These responses are not highlighted because they weren't frequent in the data set and does not have any vital impact on customer jobs. Moreover, the responses “collaborate with parents” and “contact point for parents” is the supportive jobs that create secondary importance in the job role for a teacher.

In table 10, some of the responses are portrayed which were gathered from sixteen different groups of stakeholders. The only missing stakeholder from this group is property evaluation consultant as this stakeholder is not so familiar compared to other stakeholders and in the response, it was stated that “same things apply as for other stakeholders”. Thus, it can be said that they believe in the same responses given by other stakeholders. Moreover, it can be seen from table 10 that the rest of the stakeholders have given similar responses that have been discussed earlier.

Table 10. Responses of Customer jobs.

Smart & clean solutions	Renovations	Facility owner	Property technologies	Tracking and managing living conditions
Teach children (including social skills)	to promote and provide learning	good learning outcomes	Teachthings, attitudes	care and education of children
Ventilation solutions	Facility owner and renter	Construction and renovation planning	Facility owner	Health Institute
to teach and get the children to learn	raising children	to teaches to think and acquire knowledge	Teach children	to educate the children
Facility management-facility manager	Facility management 2-facility manager	Health Institute 2	Ventilation equipment manufacturer-salesperson	Hospital Doctor
to help children how to suck in information	learning how to learn	develop the children knowledge and skills	care and education of children	to teach children
University associate professor				
show the pupils the possibilities, the ways				

Customer pains

The stakeholders were asked to talk about the pains they think teachers come across to get their job done. The respondents answered that the pains for the teacher are illnesses (children and teachers), physical load (poor indoor air), working environment, low concentration, low motivation from children, low vitality, discipline (attendance), lack of teaching materials, old school teaching materials, interaction with parents, technological challenges and change of teaching and technologies. From the data set, it is found that there are 78 responses in relation to customer pains. The responses that presented a similar type of thought from the stakeholders are discussed above.

The findings discovered from the customer pains encompassed the annoying elements that create disturbance in order to accomplish their jobs. Illness of teacher and children is a significant element that creates a barrier to maintain regular

attendance. Since illness, it becomes a challenge to get all the children attending the school. The rate of absenteeism has an impact on the outcome of the studies. The working environment for both teacher and student is required to be in good shape as in the responses it is seen that poor indoor air quality plays an important role in the indoor environment of the school. Teacher and student spent the maximum amount of their time in the indoor environment. It becomes a challenge for the teacher as the student's parents are worried about the indoor air quality and this issue is being focused because one of the respondents answered that "worried parents of the pupils are contacting about indoor air quality". The other problem arises is students do not leave the indoor environment of the school during break time and they spent their time in a hallway where there is the absence of proper air conditioning.

"Pupils don't go out during breaks as before. Students are in hallway where there is no proper air condition. Teachers know but it would require more strict monitoring during the breaks."

Teachers may not have the information about the availability of a channel through which information related to indoor air quality can be notified to the facility owner. It shows there is a need for an instrument to measure the indoor air quality and based on the measurement they can notify the facility to take corrective actions.

"There may not be information through what channel to get the information about the indoor air quality to the facility owner (there is electronic maintenance logging which can be used by anyone)."

The next pain figured out is lack of concentration. It is a challenge for both the teacher and the student in the classroom when there is a lack of concentration. It is essential for teachers to keep up their concentration when they are developing study materials or increasing their competency level. On the other hand, it is also problematic for the teacher if the student does not keep their concentration in the classroom when a lecture is delivered as this creates a barrier for the teacher in developing children's knowledge which ultimately leads to the unproductive outcome of students. Respondents mentioned that lack of motivation from the

student is a pain for the teacher. Motivation is essential from the students as they need to show interest towards topics taught in the class and it is a problem for teachers to influence children about sharing their opinions or get into a discussion in classroom discussions.

In the interviews, the respondents also mentioned that it is annoying for a teacher as they have a lack of resources. By the term resources, they meant teaching material for the students. The respondents think that the teacher wants to get rid of old school teaching materials. In addition to old teaching material, there is also the absence of equipment in the school that would aid the teacher in developing better materials and delivering lectures. In the modern classrooms, there are different technologies to assist the teachers in providing lectures. Hence, it becomes a pain for the teacher to keep up with the technological advancement and teachers need to develop their competency level in order to use the new technologies and follow the modern teaching method.

“Keeping up with technology development (tools, teaching methods, common language with students)”

“Continuous development and change of teaching and technologies”

Table 11 consists of a few responses gathered from sixteen groups of stakeholders. The missing stakeholder from the table is “property evaluation consultant.” Concerning this context, the only response given by the stakeholder is “Teachers are continuously in the same room.” The answer is very vague and does not specify any specific pain of the customer segment. Hence, the stakeholder is not brought up in table 11. The reason behind portraying the table 11 is to give an idea about the stakeholder’s responses.

Table 11. Responses of Customer pains.

Smart & clean solutions	Renovations	Facility owner	Property technologies	Tracking and managing living conditions
Low vitality (vireystila)	influencing the students, motivation, vitality	lack of motivation of students	continuous development and change of teaching and technologies	resources
Ventilation solutions	Facility owner and renter	Construction and renovation planning	Facility owner	Health Institute
to get all the children to come to school	communication between school and home	challenging situations, concentration problems	There may not be information through what channel to get the information about the indoor air quality to the facility owner	sometimes they can lose concentration
Facility management- facility manager	Facility management 2- facility manager	Health Institute 2	Ventilation equipment manufacturer- salesperson	Hospital Doctor
high expectations from parents	low motivation from children	continuous development and change of teaching and technologies	resources	to get all the children to come to school is very problematic
University associate professor				
influencing the students and their opinions				

Customer gains

The findings from the customer gains are the last element required to be discussed to construct the customer profile. By identifying the responses from customer gain will end up the data finding section for the question related to value images. The

stakeholders were asked to share their thought about the benefits that teachers want to get their job done. The respondents answered that the gains for the teacher are good air quality (health and well-being), working environment, success in the learning process, enthusiasm, new learning environments (virtual tools) and cooperation with parents. A total of 45 responses were found from the stakeholders, and the similar type of responses are discussed above.

The data gathered from the customer responses consist of gains that the teacher wants to attain in order to get their job done. The teachers want to have a better working environment where there will be good indoor air quality that will keep both students and teachers in good health. If the indoor air quality is better, it might have assisted teachers to bring success in the learning process. The main objective of the teacher is to provide a pleasant learning environment for students and achieve better outcomes. Technological advancement has given birth to much new equipment and virtual tools that might be implemented in the learning environment to create a better and fruitful learning process for the students. In the section of customer pain, it was discovered that students are not motivated in the classroom so the respondents think that teacher wants to find out a solution to this matter and they want to figure out a stimulating environment that would bring enthusiasm among the students towards learning. Captivating students in classroom lectures is always a challenging thing for teachers. The students do not hold their concentration in the classroom and teachers wants to find a way that would guide pupils to concentrate on the right issues. One of the respondents mentioned that air quality at school could be a reason in holding pupils' concentration. The respondent thinks that there might be a relationship between indoor air quality and concentration.

“Air quality at the school (affect concentration of pupils)”

Table 12 consists of some of the responses gathered from sixteen groups of stakeholders. There were no responses from the stakeholder “property evaluation consultant” so the name is not presented in the table. The similar responses and the responses that came very often are discussed above. Few responses such as “great team of people,” “ever-changing job,” “not sitting all the time” were not discussed in

the findings, and these responses were also avoided during the data analysis as some of these responses were not precise, or it has nothing to do concerning the context. Table 12 will provide an idea regarding the responses found from customer gain.

Table 12. Responses of Customer gains.

Smart & clean solutions	Renovations	Facility owner	Property technologies	Tracking and managing living conditions
Stimulating environment	Success in work	Air quality at the school (affect concentration of pupils)	there are lots of new methods available (good and bad)	co-operation between home and school
Ventilation solutions	Facility owner and renter	Construction and renovation planning	Facility owner	Health Institute
not sitting all the time	exploiting new technological solutions	students succeed, learn, communicate, teamwork, search for information (postgraduate)	The measurement visualisations should be clear and should include interpretation.	cooperation
Facility management-facility manager	Facility management 2-facility manager	Health Institute 2	Ventilation equipment manufacturer-salesperson	Hospital Doctor
success in work	success in learning process	there are lots of new methods available (good and bad)	cooperation with parents	ever changing job
University associate professor				
good possibilities				

7.1.3 Gain creators (value map)

The value map of the value proposition canvas consists of three elements. One of the elements is gain creators and at this point, the reason behind the existence of second sub-research question appears. The second sub-research question aims to figure out the gains that would emerge from the novel service for the teacher. There are multiple gain creators derived from the stakeholders' responses. As mentioned earlier, before the responses were collected for value map, the ESTABLISH project

was presented to the stakeholders again but on a broader aspect which consisted of the solutions to ESTABLISH.

After the presentation of the ESTABLISH project, the respondents were asked to share their thought about the gains that the novel service is going to deliver for the teachers. The interviewees responded that the benefits from the novel service are a demonstration of air quality, well-being at the workplace, healthier environment, optimized working environment, real-time monitoring, and information-based response. From the data set, it was found that there was a total of 18 responses from the stakeholders and in relation to the context the responses are discussed above.

Based on the data gathering it was found that novel sensor based indoor air quality service is going to expose the condition of air quality inside the school. The comprehensive mechanism of the sensors is going to exhibit the condition of indoor air quality. This would provide both students and teachers a healthier workplace where they would be able to carry out their daily work in a comfortable and efficient way.

“Healthier environment means higher efficiency”

The novel service is going to create a productive working environment where the students will be enthusiastic. In an optimized working, environment teacher will find their desired outcome like student’s absenteeism will be lower and better academic result will be achieved. Teachers in attaining a better educational outcome from the student will assist in displaying the parents of the children that their children are in a well-shaped learning environment.

“Better health means less illnesses, more working days and hours”

“Can show the parents that children have perfect learning environment”

The targeted customer segment will gain a real-time monitoring feature from the novel service. The information will be received by the user based on the

measurement of the indoor air quality. This feature will help the teacher to know the actual situation of the indoor air quality inside the school premises. Based on the measured data the teacher can notify the facility owner to take corrective actions about the air quality inside the school.

“Real-time monitoring of the condition of the property”

“Receives information on the measured indoor air quality”

The users (pupils and teachers) can achieve a personalized response from the system based on the measured data and can have user feedback on the air quality impact. Hence, the novel service has the capability of providing the user with a response based on the information.

“Real-time monitoring and information-based response”

Table 13 consists of some of the responses gathered from twelve groups of stakeholders. There were no responses found from property technologies, tracking and managing living conditions, facility owner and renter, ventilation solutions, and property evaluation consultant. Hence the name of the stakeholder's is missing from the table. Responses like “recommended playtime outdoors,” “showing the way to others” and “can show modernity of the premises” are not discussed above because the responses are vague and do not create any importance to the context. As a result, the responses are not brought into account while analyzing the data. Table 13 aims to provide an idea to the reader about the responses collected concerning customer gain.

Table 13. Responses of Gain creators.

Smart & clean solutions	Renovations	Facility owner	Construction and renovation planning	Facility owner
Awareness increasing	stakeholder communication, demonstration of air quality	Well-being at the workplace (social relationships) affects how the environment is perceived	the working environment remains optimized (automatic adjustment, ventilation)	Receives information on the measured indoor air quality
Recommended playtime outdoors	x	x	real-time monitoring of the condition of the property	x
x	x	x	information-based response	x
Health Institute	Facility management-facility manager	Facility management 2-facility manager	Health Institute 2	Ventilation equipment manufacturer-salesperson
healthier environment means higher efficiency	demonstration of air quality	Well-being at the workplace (social relationships) affects how the environment is perceived	showing the way to others	these pioneers can lead the others who are followed by others
better health means less illnesses, more working days and hours	x	x	x	x
Hospital Doctor	University associate professor			
can show modernity of the premises	can show the parents that children have perfect learning environment			

7.1.4 Pain relievers (value map)

The remaining elements for the findings' section in the value map are products and services and pain relievers. In this section, the findings related to pain relievers will be discussed, and due to this, the final sub-research question was formulated. The objective of the third sub-research question is to identify the value of the novel service that will alleviate the pains for the teachers in getting their job done. Based on the responses derived from the data, it is found that the novel service consists of many pain relievers.

The respondents were asked to share their view about the pain relievers that the novel service is going to generate for the teachers. The respondents shared that the pain relievers from the novel service are good indoor air quality, increases vitality, better concentration, healthier work and study environment, better health, real-time reporting (app), automated HVAC & other functions and control VOC emissions. Based on the data gathering it was found that there was a total of 42 responses and concerning the context, the responses are discussed above.

The respondents mentioned that by using the novel service the teachers and students would experience a better indoor air quality. If good indoor air quality exists in the school, it will provide both teachers and students a healthier study and work environment. Teacher experiences stress as they need to deliver quality work from the aspect of designing study materials and taking multiple lectures. Hence, working in a healthy environment will be beneficial for the teachers as it will reduce the stress level. Moreover, the system aids to provide a self-monitoring system, so the user knows the actual condition of the indoor air quality.

“The physical experience of the teacher (stress), self-monitoring”

Concentration is an important issue for both students and teachers which was mentioned in the customer profile. It is tough for teachers to hold the concentration of pupils during lessons and it is also challenging for teachers as well to keep the concentration while teaching. As a result, good indoor air quality will enhance concentration among teachers and students.

“Concentration of people during lessons”

“Concentration on teaching”

Teachers want their student to be active in the classroom lectures. It is a pain for the teachers if the children do not participate in classroom lectures and group works. Vitality is an important indicator of motivation and health. Using the novel service,

the teacher will be able to create a better indoor environment that will increase the vitality of pupils in the classroom.

“Increasing vitality of pupils”

The respondents also mentioned that the novel service is going to notify the user’s real-time data of indoor air quality. This would help the teachers to take corrective actions and know the actual condition of air quality. The novel service provides automated HVAC system for the user that ultimately reduces the manual interference from the user’s end. Hence, this provides no extra focus from the user’s end in controlling the HVAC system.

“Automated HVAC & other functions without any work from the users”

Table 14 consists of some of the responses gathered from sixteen groups of stakeholders. There were no responses from property evaluation consultant, so it is missing from the table. Responses such as “to show the children what innovations can do in real life” is not considered as it does not create any importance with the context. Table 14 aims to provide an idea to the reader about the value, the novel service is going to generate in alleviating pains for the teachers.

Table 14. Responses of Pain relievers.

Smart & clean solutions	Renovations	Facility owner	Property technologies	Tracking and managing living conditions
Increasing vitality of pupils	co2 in class, real-time reporting (app), winding	Automated HVAC & other functions without any work from the users	healthier work environment (automatic adjustment, no additional work for a teacher)	Good indoor air quality
Ventilation solutions	Facility owner and renter	Construction and renovation planning	Facility owner	Health Institute
vitality of the pupils	scheduling the breaks (based on the CO2 level etc.)	streamlining time usage (yield for additional investment) through technology	Receiving information calms.	possibility to control the air quality
Facility management-facility manager	Facility management 2-facility manager	Health Institute 2	Ventilation equipment manufacturer-salesperson	Hospital Doctor
co2 in class, real-time reporting (app), winding	Automated HVAC & other functions without any work from the users	to show the children what innovations can do in the real life	great indoor air quality	healthier children
University associate professor				
can see the graphs of CO2 concentration				

Products and services (value map)

The final element left to discuss in the value map is products and services. There was no question formulated to gather data and the discussion related to this element will be continued in the analysis section.

The findings from the predetermined sub-research questions are discussed. In this section, the findings related to customer profile (value image) and value map are addressed separately to keep coherence with the data gathering structure conducted by the case company.

8 RESEARCH ANALYSIS

This chapter includes the analysis section of this research which consists of both theoretical and empirical parts. The main objective of this chapter is to create a bridge between findings and theoretical section to construct the value proposition identifying canvas (conceptual model of this thesis). The discussion in this chapter will assist in reaching the research objective.

8.1 The value images (Customer Profile)

The analysis in this section is discussed in the same pattern as the findings chapter. Hence, customer jobs, pains, and gains are discussed separately. However, in the end, all the elements will be brought up together to form a customer profile.

Customer jobs

The data gathered with respect to customer jobs are already discussed in the findings chapter. In this section, the nodes that have been created by the researcher based on collected data will be unveiled. The nodes for customer jobs are portrayed in figure 14.

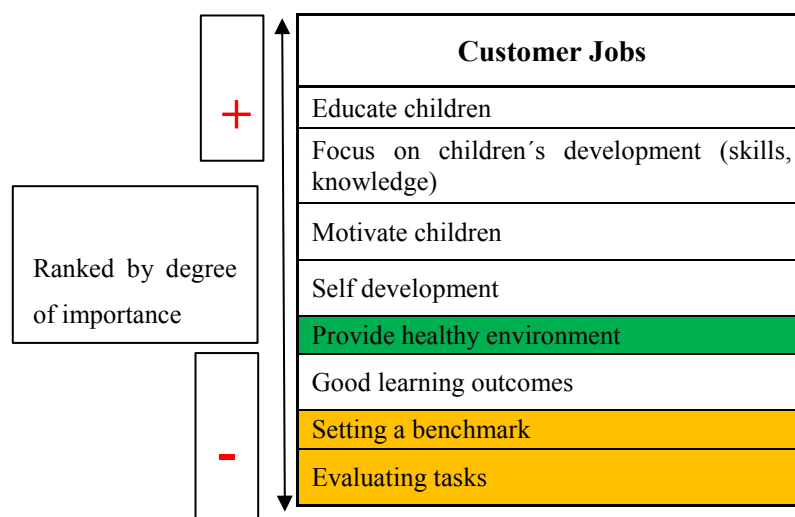


Figure 14. Nodes of customer jobs.

One of the contexts of value images is identifying customer jobs. The above nodes specify the jobs of a teacher. The jobs are being ranked by degree of importance based on the frequency of participants' response towards each job. Osterwalder et al.'s (2014, p. 13) mentioned that all the jobs do not create the same importance to customers that mean some jobs are important in customer's work and some are insignificant. Each of the jobs mentioned in the customer jobs by the participants portrays different duties that a teacher attains in the workplace. In relation to the responses, it can be related with Osterwalder et al.'s (2014, p. 12) statement where it is mentioned that customer jobs present the things that a customer is trying to attain in their work or life.

In figure 14 teacher's jobs are divided into three different colors (white, green and orange). By color it differentiates three different types of jobs where the white blocks represent functional jobs, the green block represents emotional job, and the orange blocks represent social jobs. The jobs are being differentiated in three different categories because Osterwalder et al.'s (2014, p. 12) in designing customer jobs, distinguished the jobs (functional jobs, emotional jobs, and social jobs) based on its characteristics.

Respondents mentioned that teachers in the school perform specific tasks like educating children, motivate children, focus on their development, accomplish self-development in order to enhance their skills and achieve good outcome from the students. The jobs identified above resembles the characteristics of functional jobs mentioned in (Osterwalder et al., 2014 p. 12) that explains functional jobs are the jobs that customer attempt or accomplish for a certain task or look to fix a certain problem.

Respondents mentioned that teachers prefer a healthy environment within the school which will keep the children safe and healthy. This is the only emotional job identified in customer jobs. Osterwalder et al.'s (2014, p. 12) mention that the emotional jobs take place when customers look for a certain state of emotion like feeling secure which provides peace of mind and this characteristic portrays similar idea about the identified job.

There were only two social jobs identified from the participants' response. One of the teacher's job is complimenting homework of the students and based on the evaluation by the teacher, the performance of the students might get good and better outcome might appear from the class which will impact on the performance of a teacher that might distinguish a teacher better among the group of other teachers in the school. The other jobs of teachers are shaping the personality of children and create an example of good children. In setting these benchmarks, it will create a school of well-behaved students that will ultimately impact on the performance of teachers, and the teachers will be recognized as eligible teachers in the society. Both the jobs portray that teachers want them to be perceived good among other teachers in the society. These characteristics of the identified jobs match with the definition given by Osterwalder et al. (2014, p. 12) where it is mentioned that through social jobs it can be determined whether a customer is looking for status or power and these jobs define how a customer wants him to be recognized in front of others.

Customer pains

In the findings section, the pains related to the customer are already discussed. The nodes related to customer pains are created by the researcher based on the findings is unveiled in figure 15.

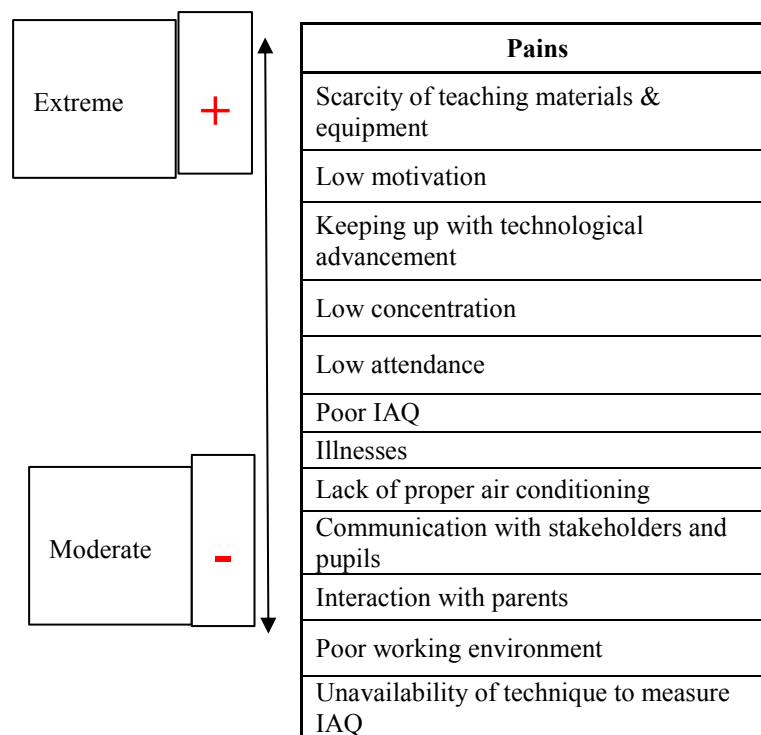


Figure 15. Nodes of customer pains.

Participants were able to identify the pains of the teacher. The pains identified by the respondents annoy teacher or stop teacher in getting their job done. All the pains of the teacher portrayed under the heading customer pains involve risk which is associated with the performance of the teacher in getting a good outcome from the student. The characteristics of teacher's pains have the connection with Osterwalder et al.'s (2014, p. 14) definition of customer pains which explains pains refer to anything that annoys customer or stops a customer in getting their jobs done and it also includes risks in getting the result.

The pains of the teachers are being categorized based on the degree from "extreme" to "moderate." The categorization is done based on the frequency of a particular response from the participants. The pains at the top are extreme which means those pains are mostly annoying or preventing teachers from getting their job done. The categorization of these responses is done by the researcher to show the severity of each pain. In relation to the classifications of teacher's pains, the explanation from

(Osterwalder et al., 2014, p. 14) portrays that the degree of customer pains lies between moderate and extreme and in figuring out customer's way to measure pain severity would assist in constructing superior pain relievers in the value proposition.

Customer gains

Customer gains are the last element in the customer profile remained to be analyzed. Based on the findings the analysis is done by the researcher and the nodes of teachers' gain are identified, and those nodes are presented in figure 16.

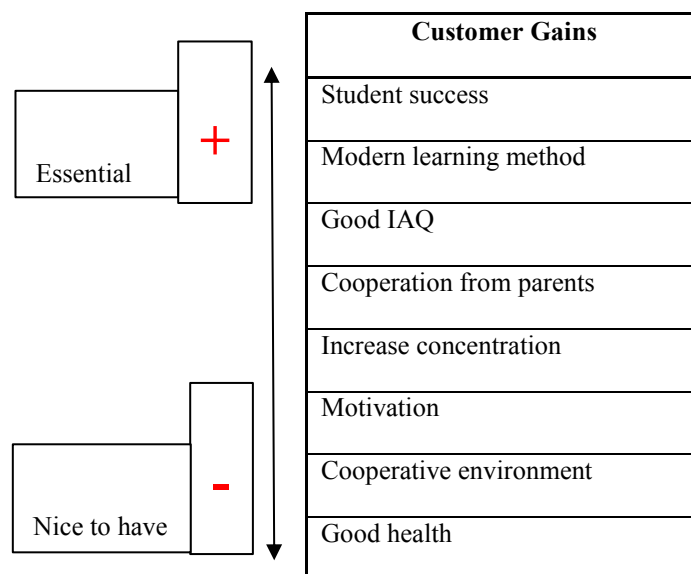


Figure 16. Nodes of customer gains.

The participants identified the factors that the teachers want to gain in the workplace. The gains identified by the participants are the benefits and results that teachers want to carry out their job. The participants think that these are the gains a teacher would investigate within a product's or service's value proposition to carry out their jobs without any hassle. The gains identified from participants' response matches with Osterwalder et al.'s (2014, p. 18) idea where it says that customer gains portray the characteristics, outcome, and features which a customer wants to get their job done smoothly.

The gains identified for the teachers are categorized based on the degree from “essential” to “nice to have”. The categorization of teachers’ gain is done based on the frequency of each response collected from the participants. The gains which are at the top of the customer gains’ table are essential for teachers that mean those are the most important gains a teacher would like to have from a product or service to perform their job efficiently. In relation to the categorization of teacher’s gains, the explanation from (Osterwalder, 2014: 16) portrays that the degree of customer gains lies between nice to have an essential which assist in designing superior gain creators in the value proposition.

The analysis for customer jobs, pains and gains are separately analyzed and discussed based on the empirical and theoretical part of the research. Figure 17 is the output of the customer profile for this research.



Figure 17. Customer profile.

The participants mentioned the relevant jobs of a teacher, and to perform well in those jobs, they require certain benefits and avoid specific pains. In figure 16 the

finding of the gain section is a list of benefits that teacher desire to get their job done; instead the findings were about specific products or services. This portrays that customers in order to meet their needs they focus on buying benefits, not products or services (Mullins et al., 2008, p. 10). The respondents precisely answered the teacher's jobs, pains, and gains which assisted in differentiating the elements from one another (Osterwalder et al., 2014, p. 16).

8.2 Gain creators (value map)

As mentioned earlier, before the data was gathered for value map the interviewer presented the ESTABLISH project in a broader aspect. The data collected from the responses are already discussed in the findings section. The researcher analyzed the findings and formed the nodes for the gain creators which is portrayed in table 15.

Table 15 Nodes of Gain creators.

Gain Creators
Indicate air quality
Well-being at the workplace/Healthy at workplace
Optimized learning environment
Tailored notification
Reduce absenteeism
Higher efficiency
Real-time monitoring IAQ condition

The case company instead of identifying the gain creators by themselves they asked the participants to identify the benefits, the novel is trying to generate for teachers. At this phase participants were presented with the ESTABLISH solutions, so they were already aware of the features of the novel service. Hence, the participants were able to recognize the value the novel service is trying to generate for teachers. The

gain creators identified by the participants clearly outlines the case company's intention in producing the value that teachers desire (Osterwalder et al., 2014, p. 33).

8.3 Pain relievers (value map)

The researcher analyzed the data and formed the nodes for the pain relievers which is portrayed in table 16.

Table 16 Nodes of Pain relievers

Pain Relievers
Provides good IAQ
Healthier work environment
Increase concentration
Real-time notification
Automated HVAC system
Increases Vitality of pupils
Control VOC emissions

Participants were able to identify the pain relievers out of the novel service precisely that aims to alleviate the pains of teachers (Osterwalder et al., 2014, p. 31). Respondents mentioned that the identified pain relievers would reduce or eliminate some of the problems that customer are annoyed with during the job (Osterwalder et al., 2014, p. 31). Respondents did not mention pain relievers for every pain identified in the customer profile as they found the novel service does not provide features that solve all the pains (Osterwalder et al., 2014, p. 31).

Products and services (value map)

The case company has filled the “products and services” segment with “ESTABLISH Indoor Solution.” Hence, no questions were developed for this section. ESTABLISH indoor solution consists of the list of benefits the novel service

is promising to deliver for teachers (Osterwalder et al., 2014, p. 31). Based on the solutions to ESTABLISH the participants developed the pain relievers and gain creators. The ESTABLISH indoor solution aims to deliver smart HVAC systems and air purifiers that ensure the healthy indoor environment, the system that autonomously adjusts the indoor air quality and customized recommendations based on the user's feedback and measures data.

The analysis of all the elements in the value map is treated separately based on the empirical and theoretical part of the research. The researcher combines all the details of the value map and fills the value map which is illustrated in figure 18.

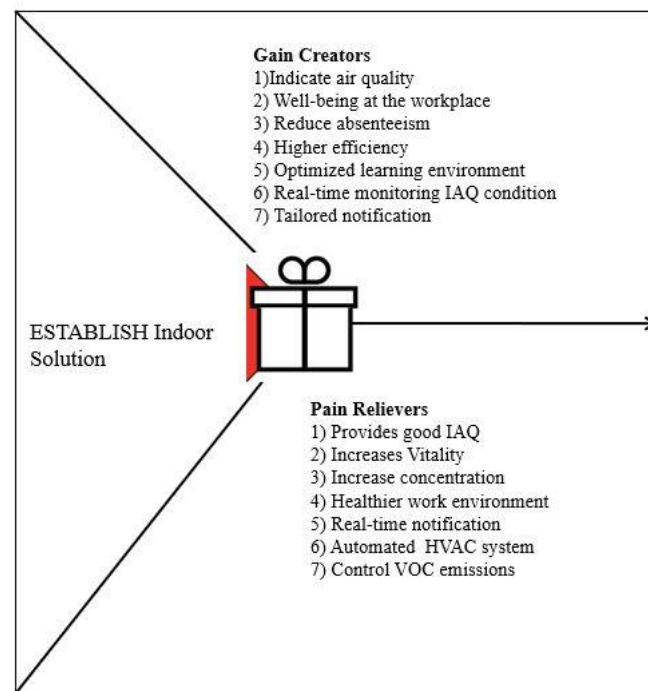


Figure 18. Value (Proposition) Map.

The “Value Map” is also known as “Value (proposition) Map” (Osterwalder et al., 2014, p. 8). Responses from the participants figured out the attributes of novel service which assisted in developing a detailed and structured value proposition (Osterwalder et al., 2014, p. 8). In developing the value proposition the pain relievers and gain creators were not being categorized in the degree between “essential” and “nice to have.” Since the researcher followed Anderson et al.’s (2006) “all benefits”

approach portrayed in table 4, where all the benefits are evaluated equally. Participants responded the gain creators and pain relievers in simple words rather than expressing any technical terms of ESTABLISH solution which shows customers avoid complex terms in recognizing the value of a certain product or service (Camlek, 2010).

The value proposition of the novel service is constructed around ESTABLISH solution (Osterwalder et al., 2014: 8). The responses related to “automated HVAC system,” “real-time monitoring notification,” “tailored notification” and “provide good IAQ” are features of the ESTABLISH solution. Respondents mentioned that the novel service will create “healthier work environment” and “well-being at the workplace” as SBS can be reduced which are caused due to the poor indoor environment (De Dear and Brager, 2002 via Al horr et al., 2016). The novel service is going to “reduce absenteeism” and “increase efficiency” by providing improving IAQ because of pollutants in indoor air cause discomfort which results in lower productivity and attendance at school (Madureira et al., 2015). If students have a healthy working environment, they will less suffer from illness and attend the school regular that will ultimately impact on their productivity so according to the respondents the novel IAQ service will provide an optimized learning environment for students. Stakeholders mentioned that the novel service by improving IAQ aims to “increase concentration” of the students as (USEPA, 2010) claimed that if IAQ is improved performance related to mental tasks, like better concentration will be increased.

8.4 Fit creating value creation

Participants have identified various jobs, pains, and gains of teacher and novel service’s value proposition. Now, it will be identified whether the value proposition of the novel service is meeting teachers’ desire and fit takes place (Osterwalder et al., 2014, p. 42). The only missing factor in creating an effective value proposition is the fit (Osterwalder et al., 2014, p. 48). In figure 19, the researcher finds the fit between the (value proposition) map and customer profile and portrays the value creation for the teacher.

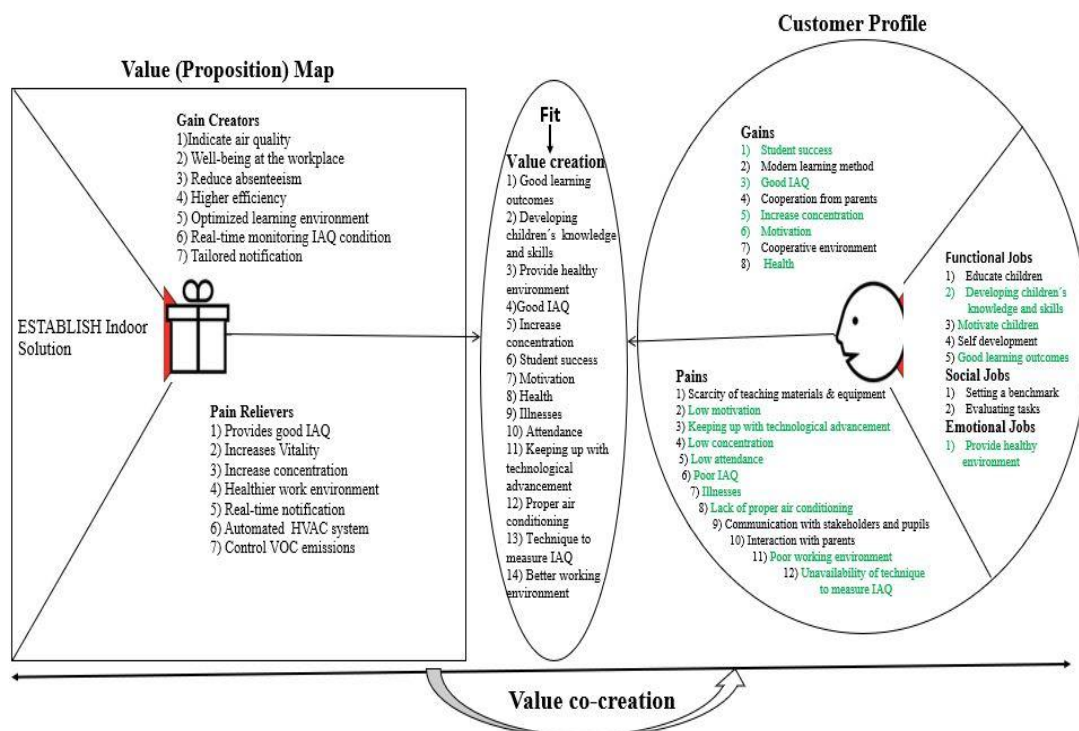


Figure 19. The conceptual model: value proposition identifying canvas is completed.

The researcher went through every gain creators and pains relievers very precisely and tried to figure out if fit takes place with teacher's jobs, gains or pains. Finally, multiple fits are achieved but it is found that the value proposition of novel service does not fit all the jobs, pains, and gains of teachers. Osterwalder et al. (2014, p. 42) mentioned that no value proposition could address all the jobs, pains, and gains in a customer profile. The jobs, pains, and gains that fits with the value proposition are colored in green. The value proposition of the novel service could address eighteen desired value of teachers. The researcher recognizes that it is a problem-solution fit. Since the case company still doesn't have any evidence that whether the customer cares about the value proposition because the fit achieved in this phase only exists in paper and not yet proven (Osterwalder et al., 2014. pp. 48-49).

The "fit" between the value (proposition) map and customer profile signifies that the value proposition can create value for the teacher. The value creation is formed between the value (proposition) canvas and customer profile depicted in figure 19.

Value is created through a value proposition by recognizing fifteen different value of teacher from jobs, pains, and gains. Initially, the value of teachers are identified and then the value proposition is constructed based on ESTABLISH solution to determine if the novel service is meeting the value of a customer as (O' Cass and NGO, 2011) argued that the objective of the business is to understand the value of a customer and develop those value for them.

The intention of the case company in targeting stakeholders in this research is to co-create the value jointly for the novel indoor air quality service. This relates with Prahalad and Ramaswamy, (2004) explanation about value co-creation where it explains value co-creation is creating value jointly by both customer and company. Stakeholders in this research played an active role with the case company in identifying the value proposition. This creates a valid ground for the case company in presenting the defined value proposition to potential stakeholders. On the other hand, potential stakeholders might find the value proposition reliable since it is developed by collaborating with stakeholders.

9 DISCUSSION

The final chapter of this thesis reveals the answers to the main research question and sub-questions. After the questions are answered the researcher will discuss theoretical contribution and managerial implication based on the existing literature and results. Finally, the study will come to an end by discussing limitation and open the door of opportunities for future research.

9.1 Conclusion

In this section, the main research question and the sub-questions of this thesis are going to be answered. As discussed earlier the main research question consists of different elements, so the main research question is broken down into three sub-questions. Answering the sub-questions will assist in answering the main research question of this thesis. Hence, the sub-questions are answered first to provide a concrete and precise answer to the key research question.

a) What are the value images for this novel service?

The value images consist of teachers' jobs, pains, and gains which basically encompasses the customer profile of the value proposition canvas. The jobs of teacher are being categorized based on functional, social and emotional jobs. The functional jobs are "educating children, focus on children's development, motivate children, self-development and good learning outcomes." The functional jobs signify that teachers are trying to accomplish a certain task or solve a definite problem. The social jobs are "setting a benchmark and evaluating tasks of pupils." The social jobs signify how the teacher wants to be recognized within society. The only emotional job is "providing a healthy environment for pupils." The emotional job signifies that in providing a healthy environment it will secure the quality of life inside schools.

The pains of teachers are "scarcity of teaching materials & equipment, low motivation of students, poor IAQ, keeping up with technological advancement, low concentration, low attendance of students, poor working environment, lack of proper air condition, illnesses, communicating with stakeholders and pupils and interacting

with parents, and unavailability of technique to measure IAQ.” The identified pains annoy the teachers in getting their jobs done and involves risk in achieving a suitable outcome.

The gains of teachers are “student success, modern learning method, good IAQ, cooperation from parents, increase concentration, motivation, cooperative environment and good health.” These are the gains or value that teachers want to achieve in order to get their job done smoothly.

b) What are the things that will be gained using the novel service?

The novel service aims to deliver some value for teachers. Answering the question will signify the value the teachers are going to achieve using the novel. The value that will be gained using the novel service are “indication of air quality, well-being at workplace, optimized learning environment, tailored notification for users, reduce absenteeism, increase efficiency and provide real-time monitoring IAQ condition.”

c) What are the pains that will be relieved using the novel service?

In order to alleviate the pains of teachers, the novel service is going to provide “good IAQ, healthier work environment, increase concentration, provide real-time notification, increase the vitality of pupils, control VOC emissions and deliver automated HVAC system.”

How can the value proposition for this type of novel technology-based service be identified?

Value proposition plays an essential role in differentiating a specific company’s product and service from the rest. The case company intends to focus on identifying value proposition to portray the stakeholder the value the novel service is aiming to provide for the user. There are different ways of identifying value proposition for a product or service but it important to choose the right tool that meets the nature of the study. Rintamäki et al. (2007) suggest a framework for identifying customer value proposition which is explained in figure 4. The framework although mention

functional and emotional aspect of the customer but does not categorize the pains and gains of a customer. Using the framework customer value might not be precisely identified. The framework developed by Rintamäki et al. (2007) also provides an added benefit where the value proposition could be evaluated for competitive advantage. The objective of this thesis is not to identify the competitive advantage of the value proposition instead it needs to show a clear picture of customer desire and a precise categorization of the value proposition that meets the customer value. Hence, this framework is not used in this study to identify the value proposition.

The value proposition for the novel sensor based indoor air quality improvement service is identified through using the concept of value proposition canvas model. In this thesis, the conceptual model (value proposition identifying canvas) depicted in figure 19, portrays the value proposition of the novel service. The case company and the stakeholders were jointly involved in identifying the value proposition for the novel technology-based service. The value proposition canvas categorizes the customer profile and value proposition map in a way that corresponds to each other. The credibility of the value proposition can be evaluated as the value proposition is able to create value for the customer by making the fit between value (proportion) map and customer profile illustrated in figure 19.

The value proposition for the novel service indicates air quality, well-being at workplace, reduce absenteeism, higher efficiency, optimized learning environment, real-time monitoring IAQ condition, tailored notification, provide good indoor air quality, increase vitality, increase concentration, healthier work environment, automated HVAC system, and control VOC emissions.

9.2 Theoretical contributions

This research aims to provide readers a clear apprehension of how value proposition could be identified for a novel technology based indoor air quality improvement service. The findings in this thesis unveil that value proposition canvas can be used to identify value proposition for novel sensor based indoor air quality service. The findings of this research studied the customer profile to identify what customer wants

from the perspective of their jobs, pains, and gains. Then the study further moved in creating value map to identify what is the value the novel service is providing for customers. The researcher has followed the steps of value proposition canvas by Osterwalder et al. (2014) in identifying the value proposition for the customer. The finding of this study supports the steps in using the value proposition canvas created by Osterwalder et al. (2014).

In this thesis, the conceptual model has contributed to the Osterwalder et al. (2014, p. 61) “value proposition canvas” by combining it with value co-creation and through “fit” value creation is recognized. In this research, the goal was to develop a value proposition for the novel service developed by the case company. The novel service aims to provide improved indoor air quality that would create a healthier life for students, teachers and other school staffs. In designing the value proposition canvas for the novel service teachers were being profiled as an end user but the target customer segment behind identifying value proposition for this research were stakeholders. Since the case company wants to generate interest among stakeholders so that they invest in this novel concept and give it a physical shape to make it available for the end users. The value proposition canvas in this study is combined with the value co-creation concept which indicates the value proposition is being identified jointly by stakeholder and case company in order to create value for customers. According to Osterwalder et al. (2014, p. 29), the value map is filled by the company. The researcher in this study does not agree with this idea. If the company aware their customers with their offerings and ask the customer to fill up the value map it creates the value map more concrete. Since customers are the ones who need to recognize the value proposition for a company and in this research, the value map is being created from customers’ responses. Furthermore, the stakeholders were also involved in designing the customer profile for the end user. That is why the researcher in this thesis has combined the value proposition canvas with value co-creation concept in identifying the value proposition for the novel service.

According to Osterwalder et al. (2014, p. 48), a fit takes place when the company addresses the jobs, pains, and gains identified in the customer profile. Though it is not possible for any value proposition to find fit for all the jobs, pains and identified

in the customer profile, this means when a fit takes place a specific value of value proposition is meeting one or more customer requirement in the customer profile. According to Pokorná et al. (2015), the value proposition canvas gives a vivid picture of how a company is creating value for its customers. Vargo et al. (2008) state that value creation is a process that aims to improve the well-being of the customer. Therefore, it can be said that value creation is formed when the fit takes place. Value is created for customers every time a fit takes place between value proposition and customer profile. As this scenario is evolved, the researcher in the value proposition canvas inserted value creation which recognizes all the fits of customer profile.

This research has investigated the value proposition canvas model from the perspective of value co-creation and value creation. As a result, the researcher has reconfigured the value proposition canvas model which succeeded in identifying value proposition for the novel service. The researcher's perspective of configuring the existing value proposition canvas made new contributions in this thesis.

9.3 Managerial implications

The model used in this research identified the value proposition for the novel service. The value proposition is identified through a co-creation process between different relevant stakeholders and the case company. The case company can utilize the value proposition of the novel service to captivate potential stakeholders. The concept of this novel service lies in the conceptual stage so the case company expecting to collaborate with potential investors or stakeholders is rational. The stakeholders can play a major role in giving the novel service a tangible shape and make it available in the market. There are other technologies existing in the market which are responsible for creating improved indoor air quality for the occupants. In this scenario, the stakeholders would see in what way the novel service is going to outplay the existing technologies. Hence, the value proposition would help the case company to portray a comprehensive picture of the value that the novel service is promising to deliver for the users. Based on the value proposition the stakeholders can differentiate the novel service with the existing technologies in the market. Moreover, it is obvious that stakeholders will be investing in the novel service and make it available in the

market if the novel service is feasible and creates value for the end users. If the value is created for the end users, there will be a rise in demand for a certain novel technology that will ultimately create a profitable business for stakeholders. Hence, it is important for the case company to portray the credibility of the novel service in delivering the value that would meet the requirement of end users.

The case company can portray potential stakeholders the value creation out of the novel service which is formed by addressing user requirements through fit. In this way, the case company can showcase potential stakeholders the evidence of value proposition in meeting customer requirements. This may generate interest among stakeholders to uncover the novel technology by investing in it to give it a physical shape. The involvement of stakeholders in identifying the value proposition creates a solid ground of credibility to captivate potential stakeholders. As a result, the case company has a valid ground in showcasing the value proposition to its stakeholders.

9.4 Evaluation of the research

In this research, the objective was to discover the value proposition for a novel sensor-based indoor air quality improvement service. In order to reach the goal of this thesis, the applied research method is a qualitative case study. Face to face interview, Skype interview and focus group discussion are the strategies that are being used to conduct the case study research. In this study, the findings appear with certain limitation because of the characteristics of this research. The results cannot be generalizable in this thesis. In research, the term generalizability defines the extent to which the findings of research discovered from the study sample can be generalized to the whole population (Polit and Hungler, 1991: 645 via Ali and Yusof, 2011). In this study, the sample size based on which the findings are collected is small. The sample taken for this research is based on a specific group of stakeholders in order to meet the objective of this research. The findings might vary if the sample is gathered from the different industry background. Additionally, the research is based on a technology-based solution so involving a sample which is not relevant to the study might show different findings. According to (Leung, 2015) most of the qualitative research studies focus on a certain phenomenon and a specific population,

so usually generalizability in qualitative research studies is unexpected. As this thesis is following the qualitative case study method and focusing on a certain sample so it can be concluded that the findings in this research cannot be generalized to the entire population.

In qualitative research, validity evaluates the appropriateness of the process, data, and tools that are being used in the study (Leung, 2015). The sub-questions in this study is based on the concept which is prominent in the ground of academics and practitioners. Since the main research question is broken down into sub-questions and met the desired outcome of the research so it can be said that the research question is valid. The research question developed in this thesis tried to explore a certain phenomenon. The research method for this thesis follows a qualitative case study technique. The case study in this research is categorized as an exploratory case study. From this perspective the methodology chose for this research is suitable for identifying the answer to the research question. Hence, the research method for this thesis is valid. Furthermore, in this study, the data is gathered through focus group discussion and semi-structured interviews which is conducted through face to face and Skype interviews. In this research, the case company has observed the interviews and gathered the data, so it gives evidence that the data gathered from interviews are valid. Hence, it can be concluded that the process, data, and tool used in this research are valid.

According to (Ali and Yusof, 2011) reliability is applicable in research if another researcher studies the same event and arrives at the same findings. In this thesis, the findings are based on Finland and the Czech Republic which are developed countries, but the findings are likely to change if the same research phenomenon is studied in developing countries. Moreover, if the study is conducted on a different sample the same findings might not be achieved. (Stenbacka, 2011 via Ali and Yusof, 2011) argues that in qualitative research reliability is not relevant since the issue of reliability relates to measurement. This thesis portrays the nature of qualitative research so there is an absence of reliability in this research.

9.5 Limitations

The findings in this thesis are based on a specific group of stakeholders who belongs to developed countries. They were able to identify the problems of users getting affected by poor indoor air quality. If the data was gathered from developing countries the same findings might not appear due to knowledge gaps regarding poor indoor air quality.

Initially, the case company planned to gather the data from Finland, Czech Republic, Spain, Turkey, Romania and the Republic of Korea. Due to time limitation the case company was unable to collect data from Spain, Turkey, and Romania. The data arrived from the Republic of Korea did not match the same user group. Hence the findings of this research derived from Finland and the Czech Republic. The data derived from Finland and the Czech Republic did not create any dissimilar nature. The data from the remaining countries could have assisted the researcher to identify the difference in responses and its impact on the value proposition.

The thesis lag to show the presence of secondary data. The model used in this study to identify the value proposition in the domain of indoor air quality service is not used yet. As a matter of fact, the researcher was unable to find sources of secondary data for the empirical section of the research. Unavailability of secondary data to complement the analysis is a significant limitation for this thesis.

9.6 Future research suggestions

This thesis is one of a kind in the field of identifying the value proposition. Since the prior thesis combined the tool value proposition canvas with value co-creation concept and the value proposition is identified for the novel service. Based on the phenomenon this thesis creates wider opportunities for researchers. Depending on the nature of the research the researchers can further utilize the value proposition canvas tool alone or combine it with the value co-creation concept for identifying value proposition in the field of indoor air quality improvement technology. As a matter of fact, this will enhance more significance in the ground of academics.

Due to the limitation of time data was not gathered from Spain, Turkey, and Romania. This research can be further studied based on the remaining data set. Future researchers can analyze the data set to identify whether the data varies with respect to counties and contribute to the existing research.

As mentioned before there are other indoor air quality improvement service exists in the market. The novel indoor air quality improvement service designed by the case company aims to deliver more value compared to existing solutions in the market. Based on the existing study, future researchers can continue their research in identifying the competitive advantage of this novel service. This will assist the case company to identify whether the novel service will gain popularity among the users by delivering more value compared to the existing indoor air quality improvement service providers.

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APPENDIX

The table portrays the data collected through stakeholders' responses from Finland and the Czech Republic.

Industry	Custom jobs	Pains	Gains	Pain Relievers	Gain Creators
1 Smart & clean solutions	Teach children (including social skills)	Lack of resources	Stimulating environment	Increasing vitality of pupils	Awareness increasing
	Gain good learning results	Illnesses (children and teachers)	Guiding pupils to concentrate on right issues	Increased air quality	Recommended playtime outdoors
	Keep children safe and healthy	Concentration	Nice time together (social skills, co-operation)	Suitable temperature	x
	Have fun	Low vitality (vireystila)	Health	Increased safety	x
	x	Teachers are not able to teach like planned	Planned teaching set	Concentration on teaching	x
	x	Little exercise -> low concentration	Good air quality (health and wellbeing)	x	x
	x	Lack of teaching materials	x	x	x
	x	Lack of circumstances (too hot/cold, air quality, dangerous pathways...)	x	x	x
	x	Teacher's wellbeing and health	x	x	x
	x	Changes in personnel	x	x	x
2 Renovations	to promote and provide learning	managing your own work	Success in work, influence, inspiration, social situations, socialization	co2 in class, real-time reporting (app), winding	stakeholder communication, demonstration of air quality
	(X) preparation (own competence)	pressure from stakeholders, management of these	x	arranging guidance appropriately	x
	interaction: parents, stakeholders, other teachers	influencing the students, motivation, vitality	x	VOC emissions control	x
	x	lack of materials and equipment in the learning environment	x	x	x
	x	communication with stakeholders and pupils	x	the physical experience of the teacher (stress), self-monitoring	x
3 Facility owner	good learning outcomes	lack of the motivation of students	Curriculum and management system guiding teaching, social relationships	Automated HVAC & other functions without any work from the users	Well-being at the workplace (social relationships) affects how the environment is perceived
	raising enthusiasm and curiosity	the challenges faced by individuals that are reflected in school work	Air quality at the school (affect concentration of pupils)	x	x
	(X)learning how to learn (the ability to learn and embrace new, to combine entities...)	lack of time lag, scarcity of resources (requirements for teachers do not decrease)	cosiness, aesthetics (feeling of appreciation)	x	x
	x	learning materials and tools (information retrieval, producing information, filming ...) and the teacher's competence to utilize new tools	new learning environments (virtual tools ...)	x	x
	x	x	keeps on making changes (digitalization, etc.) through young people and students, enthusiasm, energy	x	x

Industry	Customer segment			Value proposition, Concept 1 (indoor)	
	Customers jobs	Pains	Gains	Pain Relievers	Gain Creators
4 Property technologies	teach things, attitudes	use of time; a lot of other issues than actual teaching	the appreciation of teaching in society is significant	a more peaceful group of pupils	x
	focus on the pupils, development their knowledge and skills	societal changes	lots of investments for teaching	healthier work environment (automatic adjustment, no additional work for a teacher)	x
	x	continuous development and change of teaching and technologies	there are lots of new methods available (good and bad)	x	x
	x	Motivation of pupils, discipline (attendance)	x	x	x
	x	constant change and uncertainty	x	x	x
	x	x	x	x	x
5 Tracking and managing living conditions	care and education of children	co-operation between home and school	co-operation between home and school	Good indoor air quality	x
	attitude and opinion editing (complementing the home care task)	resources	rewarding job (learning, influencing development)	the physical well-being of teachers and pupils	x
	x	Keeping up with technology development (tools, teaching methods, common language with students)	x	concentration of pupils during the lessons	x
	x	x	x	x	x
6 Ventilation solutions	to teach and get the children to learn	to get all the children to come to school	not sitting all the time	good air quality	x
	x	managing different cultures	challenging job	vitality of the pupils	x
	x	home life of pupils	x	wellbeing	x
	x	to get pupils to be interested in	x	x	x
7 Facility owner and renter	raising children	time management	exploiting new technological solutions	scheduling the breaks (based on the CO2 level etc.)	x
	utilizing the latest teaching methods	communication between school and home	x	increasing vitality	x
	x	different levels of the pupils' know-how	x	x	x
	x	lack of financial resources and prioritization of the use	x	x	x
8 Construction and renovation planning	education and training, data transfer	noise	multi-culture	(yield for additional investment) through	remains optimized (automatic adjustment,
	to teaches to think and acquire knowledge	challenging situations, concentration problems	utilizing the current technology	reassuring parents / staff	real-time monitoring of the condition of the property
	x	physical load (poor indoor air)	students succeed, learn, communicate, teamwork, search for information (postgraduate)	x	information-based response
	x	time use (time for pupil)	teacher community	x	use of data as an educational material
	x	group size	working environment	x	x
	x	compliance with the curriculum	x	x	x
	x	interaction with parents	x	x	x
	x	multi-culture	x	x	x
	x	technological challenges	x	x	x
	x	working environment	x	x	x
	x	x	x	x	x

Industry	Customer segment			Value proposition, Concept 1 (indoor)	
	Customer jobs	Pains	Gains	Pain Relievers	Gain Creators
10 Property evaluation consultant	Same things apply as for other stakeholders	Teachers are continuously in same room	x	x	x
	Not so familiar stakeholder	x	x	x	x
11 Facility owner	Stay healthy and functioning	Teachers might be creating hysteria	Information available in the class room	Receiving information calms.	It would be good if the system would notify and teach how each parameter affects. Tells the basics about the indoor air quality, <i>cause and effect</i>
	Teach children	There may not be information through what channel to get the information about the indoor air quality to the facility owner (there is electronic maintenance logging which can be used by anyone)	The measurement visualisations should be clear and should include interpretation.	x	Receives information on the measured indoor air quality
	Create safe environment for the pupils	Pupils don't go out during breaks as before. Students are in hallway where there is no proper air condition. Teachers know but it would require more strict monitoring during the breaks.	x	x	x
	Tell further of their symptoms to boss or facility owner	There is dry climate in Finland during the winter.	x	x	x
	Contact point for parents	There is not enough information about what causes what.	x	x	x
	x	Worried parents of the pupils are contacting about indoor air	x	x	x
Health Institute	to educate the children	lower salaries than in the company	it is mostly very interesting to be around young people	better air quality	healthier environment means higher efficiency
	to bring up the children	pressure from parents	seeing how the children grow and learn	higher concentration of children	better health means less illnesses, more working days and hours
	collaborate with parents	sometimes they can loose concentration	cooperation	better health	
	try to motivate the children	sometimes teacher have less time than planned		possibility to control the air quality	
		old equipment			
		oldschool teaching materials			
Facility management 2-facility manager	prepare children for the real life, to easily get the job or start its own job	low motivation from children	success in learning process	Automated HVAC & other functions without any work from the users	Well-being at the workplace (social relationships) affects how the environment is perceived
	learning how to learn	the challenges faced by individuals that are reflected in school work	learning children and learning from them	without necessity to open windows	
	to be a good example for children	lack of time and a lot of forms to fill in	cosiness, aesthetics (feeling of appreciation)	healthier work and study environment (automatic adjustment, no additional work for a teacher)	
		learning materials and tools	new learning environments (virtual tools ...)		

Industry	Customer segment			Value proposition, Concept 1 (indoor)	
	Customer jobs	Pains	Gains	Pain Relievers	Gain Creators
Facility management- facility manager	to help children how to suck in information	high expectations from parents	success in work	co2 in class, real-time reporting (app), window	demonstration of air quality
	help children to cooperate with others, work in groups	a lot of bureaucracy from the above	to see the children working together	CO2, temperature and humidity concentration control	
		uncultivated children	possibility to influence the children's evolution	concentration on teaching itself	
		lack of materials and equipment			
Health Institute 2	teach how to be an intelligent and generous person	use of time; a lot of other issues than actual teaching	the appreciation of teaching in society is significant	to show the children what innovations can do in the real life	showing the way to others
	develop the childrens knowledge and skills	continuous development and change of teaching and technologies	lots of investments for teaching in last few years	healthier environment	
		motivation of pupils, discipline	there are lots of new methods available (good and bad)		
		quick changes in the way of learning			
Ventilation equipment manufacturer- salesperson	care and education of children	cooperation with parents	cooperation with parents	great indoor air quality	these pioneers can lead the others who are followed by others
	attitude and opinion editing (complementing the home care task)	resources		concentration of pupils during the lessons	
		technology development			
Hospital Doctor		to get all the children to come to school is very problematic	ever changing job	sufficient air quality	can show modernity of the premises
	to teach children	to get pupils to be interested in the topic is difficult		healthier children	
	to listen to their needs try to motivate them			better concentration	
University associate professor	show the pupils the possibilities, the ways	influencing the students and their opinions	good possibilities	to show the children what innovations can do in the real life	can show the parents that children have perfect learning environment
	to shape the children's personality	lack of materials and equipment	great team of people	can see the graphs of CO2 concentration	
		tough communication with stakeholders and pupils			