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Master's Thesis Project in Innovation and Industrial Management

Sustainable Value Proposition for the Digitalization of the Fire Inspection

A Case Study of the Swedish Fire Protection Association

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Abstract

The relentless spread of technology and digitalization, over the past twenty years, has utterly altered and revolutionized the way in which corporations do business today and create and deliver value to their customers. Keeping up with the constantly changing trends is the key to not only be successful in the market, but also to develop and sustain a competitive advantage within a steadily transforming ecosystem.

The main purpose of the present Master's thesis project is to show how a public service provider can move towards a digitized Business Model and seek for value creation.

In this respect, the ultimate objective of the research here presented will be to help the Swedish Fire Protection Association (in Swedish *Brandskyddföreningen*) develop a new *Sustainable* Value Proposition concerning specifically the digitalization of the Fire Inspections, with the aim to eventually deliver more and better value for the organization itself, its customers, partners and the society as a whole.

The present investigation has been thoroughly conducted with the final intent to produce and illustrate, exploiting the Value Proposition Canvas that is a template designed by A. Osterwalder and Y. Pigneur (2014), a new feasible and *Sustainable* Value Proposition for the Swedish Fire Protection Association, by collecting, examining and assessing all the different empirical data gathered throughout the entire period of analysis.

The most important findings that have helped the author practically complete the aforementioned task and fill in the theoretical model were, for instance, the necessity perceived by the Insurance companies to have further access to their customers' personal data, to be capable to make better and advanced predictions of fire incidents and improved evaluation of the risks, to be more confident about the proper and efficient performance of the *sprinkler* systems.

Keywords: *business model and business model innovation, sustainable business model, value creation and value capture, business model Canvas and value proposition Canvas, portfolio of business models and* finally *business model and digitalization*

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Chapter 1

INTRODUCTION

By virtue of the enduring academic and business relationship between Universities and Companies all over the world as a means to produce more value, the present Master's Thesis Project has been assigned to the author by the consulting firm *First To Know Scandinavia AB (FTK),* based in Gothenburg, Sweden with the purpose to get help and assistance from an educational perspective in completing a critical task for one of the most important clients of the enterprise, the Swedish Fire Protection Association.

The project here at stake, elaborated from the author by undertaking an academic investigation and by employing scholastic resources and approaches, consists in a managerial and advising type of assignment resulting in the conception and development of new theory concerning the automation of the Fire Inspections in Sweden and the application of a theoretical model that is the Value Proposition Canvas, by A. Osterwalder (2014).

The ultimate goal of the research is indeed to build a new *Sustainable* Value Proposition for the Swedish Fire Protection Association, following the potential implementation of the digitalization within the area of Fire Inspections, which the organization administers and operates all over Sweden. To do so, the investigator has done a lot of research, from either academic and business-related sources, with the aim to suggest and provide the Swedish Fire Protection Association with an innovative model, by filling in the Value Proposition Canvas template, which they could possibly refer to when introducing automation to the field of Fire Inspections.

The work engaged by the author is part of a larger and worthwhile project, that is the *Sandbox model,* whose realization, the organization as well as other partners involved are currently evaluating, testing and experimenting the feasibility.
The *Sandbox model* provides for the creation of a digital platform for the data sharing where different types of companies can collect, store and access valuable data to help them operate in a more efficient way. The data in question includes also the information relative to Fire Inspections.

The following chapter will present an illustration of the Company Profile and the Fire Sprinkler System, that is the area of business to be innovated and transformed, as well as it will give a description of the Aim of the Research, and thus of the Research Question underlying the study, and the relevant aspects which the whole work has been focused on.

1.1 Company Profile – The Swedish Fire Protection Association

The Swedish Fire Protection Association is a non-profit organization, precisely an NGO, established in Stockholm in 1919. It is responsible for Fire Safety and Electricity Security all over Sweden, making sure that people understand and recognize the importance of protection against fire and electrical hazards and ensuring a more reliable country through the unceasing research and fortified experience (*Brandskyddföreningen* company website, 2018).

The organization runs and administers three main areas of business, that are the electrical inspections, the *sprinkler systems* (and therefore the Fire Inspections) and the fire detection. Each one of them is an independent branch of business, governed by distinct business models and operated differently depending on the requirements, techniques and authorizations. The electrical inspections, for instance, are controlled by the Electricity Board, that is a designated unit within the Swedish Fire Protection Association whose mission is to prevent property losses as well as individuals from getting injured.
The Fire Protection section, similarly, strives to safeguard the society, homes and business facilities from getting damaged in fire incidents. (*Brandskyddföreningen* company website, 2018).

The actors and corporations involved in the system and collaborating with the Swedish Fire Protection are the following:

- The Insurance companies, that represent an essential customer of the organization which the Swedish Fire Protection Association reports the results of the inspections to and commits itself to guarantee that facilities are adequately risk-safe;
- The insured, that is the net payer who purchases the insurance policy;
- The Swedish Fire Protection Association;
- The Inspection (Engineering) companies, providing training and availability of qualified personnel;
- The inspectors, operating directly the inspections, physically and manually.

Moreover, another significant function of the Swedish Fire Protection Association is to establish Rules, Standards & Guidelines for a good and safe fire protection.
Thanks to the long-time experience, the unremitting research and the data gathering the organization, in collaboration with some reputable teams, creates Recommendations and Standards for the people to follow, in order to assist the society into a steadfast growth aimed at becoming safer, guarded and more secure (*Brandskyddföreningen* company website, 2018).

1.2 Fire Sprinkler Systems

The *sprinklers* are particular devices, installed in both private and public buildings, that serve as guarantors of fire safety and protection. They do not activate by smoke, as the vast majority of people think, but they go off when they perceive the heat. In fact, if they became active as a consequence of smoke, even just burning some toasted bread would cause the ignition.
This would of course result in a substantial water damage and the *sprinklers* would be more harmful than beneficial (D. Fisher, 2018).

The *sprinkler systems* represent the first, basic defense mechanism against potential blazes arising unannounced and out of the reach of humans, and a well-functioning and maintained *sprinkler system* is a prerequisite to ensure a reliable performance of such tools in case of fire hazards (Kauffman Co., 2014).

These helpful installations require periodic inspections and regular monitoring, at the end of which the insured will be provided with a written report of the results, assessed and transcribed by the inspectors. The inspections are managed by the assigned Fire Department and vary in periodicity and category, depending on the country and the jurisdiction in force.
Mastery and experience of the inspectors also affect the fire inspections processes, and can have positive or negative consequences on the integrity of the inspection itself (K. S. Frangiamore, 2009).

The Insurance companies are concerned about an efficient application and execution of the *fire sprinklers*, why? Because they would have to repair a facility and pay off money if it gets damaged or even destroyed. Therefore, these companies would be willing to offer a lowered price to the insured, if they employ a *fire sprinkler system* in their homes or business offices and pledge to maintain it and keep it in good conditions.

For this reason, the Insurance companies are more than interested in a proper functioning of the *sprinklers* in the facilities by them insured, as well as an accurate evaluation and assessment of the potential risks of fire incidents (M. Lehner, 2017).

1.3 Aim of the Research and Research Question

The key task of the author, in pursuing the present work, is to help the Swedish Fire Protection Association create a new *Sustainable* Value Proposition for the area of business of the *sprinklers* that could eventually embrace the automation of the Fire Inspections, significant and essential components of the overall process of administration of such fire systems.

The reason behind the necessity, perceived by the organization, of improvement, change and modernism within the traditional structure of the operations by them controlled and supervised, lies in the discontent expressed by the Insurance companies, that represent the primary customers of the firm, caused by the impossibility to make accurate predictions and projections of the (fire) incidents and relative risks, without gaining access to a larger amount of data and information relative to the insured and the interested facilities.

What do we mean by "automation of the Fire Inspections"? The idea would be to apply technology to the already established *sprinklers*, by installing sensors and/or other digital devices that can prevent a possible fire in a house or a public building, detecting the signal of danger in advance and ensuring an improved reliability of the *sprinklers* themselves.
This way, the comprehensive information gathered through the sensors would then be collected into a database, accessed by the Insurance companies, where they (the customers) can be provided with further data and enabled to enhance their risk assessments and evaluations.

The fundamental rationale is that the more data is provided to the customers, the more value is created and delivered. The ultimate aim of the research is therefore to show how a public service provider can move towards a digitized Business Model and deliver more and good value to its customers, partners, and the overall society.

The Research Question is quite straightforward and it is thus the following: "*What can be an appropriate and sustainable Value Proposition for The Swedish Fire Protection Association that can support the automation of the fire inspection?"*
In order to define a Value Proposition as *appropriate* and *sustainable*, it shall possibly answer the following questions:

- What is the offering of the company? i.e. what kind of products and/or services the organization is willing to sell?
- How can such offering maximize the benefits of the end consumers?
- What is the segment of customers which the company intends to deliver value to?
- What makes such offering unique? (P. Laja, 2018).

A thorough investigation has been done with the objective of responding to the Research Question by dividing the work into the following chapters:

1. Introduction
2. Theoretical Framework
3. Methodology
4. Empirical Findings
5. Analysis
6. Conclusions

The Research Question will be then addressed precisely in the last chapter of the Conclusions.

1.4 Focus and Delimitations of the Research

The intention, in the first place, was to analyze and work on the whole Business Model Canvas framework, given that the organization is willing to transform the way they run the Fire Inspections by innovating the entire set of business models that support the three different areas of business, i.e. the electrical inspections, the *sprinklers* and the fire detection; however, due to time constraints, the focus has been narrowed down to solely the Value Proposition building block of the Canvas, that is the section that more importantly the company is interested and concerned about renovating.

Sustainability in this specific case study is intended as a long-term oriented Value Proposition, that is thus capable to be commercially successful in a time horizon of at least 10 years, as precisely outlined by the General Secretary at the Swedish Fire Protection Association: therefore, it must be a "future oriented" Value Proposition.

The research will be aimed at examining the characteristics and functioning of *sensor-based inspections* that can ensure a better and increased operativity of the *sprinkler systems*, and the potential implementation of a computer-based system, in the form of a digital database, for the

collection and assortment of sensible and yet meaningful information that the Insurance companies and other corporations can share.

Finally, the semi-structured interviews throughout which the empirical key findings have been to a large extent obtained and elaborated, have been conducted with the purpose to understand the different stakeholders' perspectives and opinions, but most importantly, the emphasis has been put on the customers' (i.e. the Insurance companies) needs, wishes and challenges of today and tomorrow.

The project here at stake, that concerns the elaboration of a *Sustainable* Value Proposition for the Swedish Fire Protection Association that would be appropriate to support the automation of the Fire Inspection, belongs to the wider research relating to the Sandbox model, and therefore to the implementation of a digital platform for the data sharing.
However, albeit being an extensive and broad research, the investigation here presented has been limited to the area of Fire Inspection due to time constraints.

Unfortunately, the researcher did not have enough access to the company's material and confidential documentation and this did not help her go more in depth into relevant aspects of the enquiry nor make more specific and detailed questions in the semi-structured interviews.

Another important concern of the organization that follows the willingness to create a brand-new database where Insurance companies and other key actors can gather, share and consult their customers' data, is how to price the novel service provided, in order to ensure money transformation and to obtain resources to invest in campaigns, research or training programs, or even enough money to run the system.
The study here conducted did not take into account such delicate issue due to shortage of time at disposal and complexity of the task.

The Swedish Fire Protection Association aims at creating and delivering more value by providing more data and information. Such attempt is intended to be pursued by renovating and aligning the whole set of Business Models referring to the areas of Electrical Inspection, Fire Inspection and Fire Detection under one unique Business Model that can handle and run all the three blocks.
First, the investigation has been restricted to solely the Value Proposition building block, and not to the whole Business Model Canvas; second, a proposal of Portfolio of Business Models has been provided in the chapter of the Literature Background as an alternative to a Uniformed Business Model, although the researcher has not focused on the practicability of it.

Lastly, the sample of customers (i.e. the Insurance companies) interviewed is relatively small, given that of all the Insurance companies contacted, only two have responded. This did not allow the researcher to generalize the results to a larger extent and therefore to collect enough pertinent data useful for the investigation.

Chapter 2

THEORETICAL FRAMEWORK

The main purpose of this Master's Thesis work is to help the Swedish Fire Protection Association develop a new, feasible and sustainable value proposition that could conceivably support their plan to digitalize the fire inspection.

For this reason, the following chapter is structured in such a manner that it will provide the reader with a thorough and detailed understanding of what a business model is and why organizations need one, focusing principally on the definition and conceptual description of *sustainable* business model and business model innovation. Afterwards, a section describing how organization can create and capture value will also be depicted, and a specific template will subsequently be presented, i.e. the Business Model Canvas, which is useful and suitable to apply when dealing with the development of new business models or the upgrade/transformation of existing ones, that is the case in question.
Ultimately, the theoretical model that will be later in the Analysis applied, named the Value Proposition Canvas will also be illustrated and explained, to show how an organization creates and delivers value to its customers.

In conclusion, a literature background will also be introduced with respect to the general case of the digitalization and automation of a service and how this phenomenon has a significant impact on business models.

2.1 Business Model and Business Model Innovation

To make things clear and easily understandable from the beginning, it is worth giving an essential definition of business model, that is "*nothing else than a representation of how an organization makes (or intends to make) money*" (A. Osterwalder, 2005). In other words, it is a powerful tool that both established companies and start-ups employ to properly understand their business, products, services and/or technology and how to make profit out of them. How does the business model respond to this peculiar need? It essentially shows where the business is positioned within the value chain and what the customer can get out of it.

The term and concept of "business model" is relatively new, it has mostly occurred in the 20th century alongside the advent of Internet, the globalization, technological improvements and increased competition, when companies started understanding that it was crucial for them to compete in the marketplace in a different way, given the speed at which the world was changing, and so were the economy and the business industry.

This topic is therefore very common among business people today, such as managers from organizations, consultants, reporters of business etc. (to cite a few), as we are witnessing a completely new attitude coming from organizations when it comes to the creation, capture and delivery of value to the customers. Indeed, recognizing the economic value of a product or a service helps enterprises identify what their consumers want, how to approach them and how to produce this value for them to be satisfied. Once a company figures out how to meet its customers' needs, it will see which way to operate can lead to better results, and thus how to generate revenues out of its activity (M. Scerri, 2015).

Many are the authors that, in time, have provided their personal classification of business model, like Teece who defines it as "*how a business enterprise delivers value to customers, entices customers to pay for value and converts those payments into profits*" (2010) or Gambardella & McGahan who describe business model as "*a mechanism for turning ideas into revenues at reasonable cost*" (2010) or even the one given by Demil & Lecoq referring to business model as "*the way activities and resources are used to ensure sustainability and growth*" (2010) (C. Baden-Fuller and M.S. Morgan, 2010) or the definition from Zott and Amit (2011) who identify the Business Model as an independent variable somehow linked to the organization's performance, and influenced by the surrounding environment.

Baden-Fuller & Morgan, for instance, offer an interesting characterization of business models, linking them to the concept of "*recipes for creative managers*": just like recipes, which enclose guidelines and procedures on how to do or prepare something, as well as a meticulous description of the ingredients and how to combine them, so do business models, for they provide managers and scholars with a way to understand and differentiate their business from the others in the industry. The ingredients contained in recipes take the form of strategic elements within business models, such as resources, competences, customers, products and services, distinctive technologies, target markets etc.

Also, they suggest how to organize and incorporate them in order for organizations to be successful and obtain positive results. Therefore, the authors emphasize the effectiveness and

strength of business models as they are able to display the business' features in a brief but adequate way (C. Baden-Fuller and M.S. Morgan, 2010).

Referring to the work by Baden-Fuller & Morgan, such analogy of the business models with the cooking recipes has been also brought up by Sabatier et al. (2010) to address the notion of "*portfolio of business models*" that helps firms detect a set of different activities responding to different customers' needs and their expected combination that would deliver value propositions.

According to Joan Magretta (2002), business models could also be expressed as "*stories that explain how enterprises work*" stating that a good business model responds to Peter Drucker's long-standing questions "Who is the customer? And what does the customer's value?" but it is also the answer to the central question that every manager should ask "How do we make money in this business? What is the basilar logic that tells us how we can deliver value to the customer at a suitable cost?".

In addition, with respect to the value chain that lies underneath all firms, business models could be divided into two parts: the first one comprises the activities related to making something, such as designing, purchasing feedstock, producing and so on; the second part consists of all the actions taken when selling something, like finding and getting in touch with the client, managing the sales, supplying the final product or service and so forth (J. Magretta, 2002; A. Ovans, 2015).

Overall, to cite a few popular definitions offered by Chesbrough (2010), business models perform distinctive functions:

- Formulate the value proposition;
- Recognize the target market and indicate the process by which the organization can generate returns and be paid for its offering
- Give details on the structure of the value chain, necessary to deliver the final product and its complementary assets;
- Evaluate the cost structure and the capability to make profits;
- Locate the position of the company within the network of actors, classifying competitors, likely complementors etc.;
- Plan and articulate the competitive strategy of the firm that would allow it to gain a competitive advantage over the others.

Given that the Swedish Fire Protection Association is an NGO non-profit organization, whose primary aim is not to make money nor profits, the researcher will rely specifically on the definitions provided by Teece, who refers to business model as a tool to describe how organizations deliver value to the customers, and the one offered by Demil & Lecoq for whom business models are a way to employ resources in order to guarantee sustainability and evolution.

Considering that business models are "strategic" analyses of a firm's competitive position, its activities and relationships within the business environment and the reference industry, they cannot be stationary templates which the organization relies on, but on the contrary, they must be able to support both managers and entrepreneurs in facing and controlling the continuous and unceasing change within the business ecosystem, providing them with constant new ideas and plans in order to be successful.

For this reason, organizations must learn how to incessantly reorganize and restructure their business models before others can potentially copy them (A. Osterwalder, 2005).

Business model innovation is essentially "*reorganizing your business model around a clear – though not always obvious – customer need, and then re-adjust your resources, activities and revenue mechanism with the new or improved value proposition*." (Innosight, Strategy & Innovation at Huron, 2018). Such strategic pursuit is not easy to achieve as it would push managers out of their comfort zone, forcing them to embrace a way of reasoning and running their business that is completely new compared to what they are used to: stepping into the so-called "white space".

The major challenges and barriers of business model experimentation that corporations typically encounter, as Foss and Saebi (2016) outline in their work, can be summarized in the following scheme:

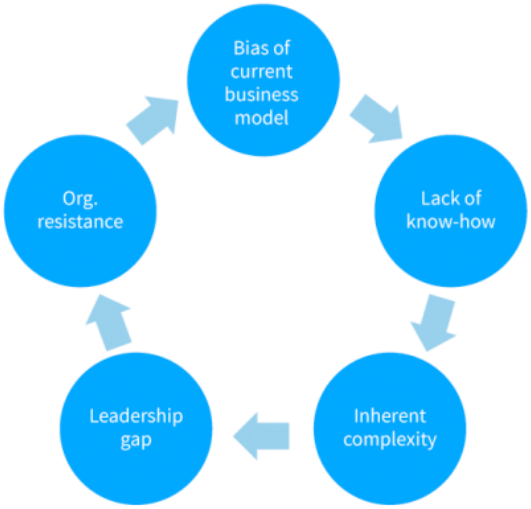

Figure 2.1 Challenges of Business Model Innovation. Source: Foss and Saebi, 2016.

However, despite such obstacles, it is suggested that managers embark on Business Model Innovation for several reasons, like for instance getting the chance to increase the profits at lower costs or generating a prevailing competitive advantage, preventing competitors from reproducing or emulating a completely new activity or system (Amit and Zott, 2010).

Essentially, it is not the characteristics of the innovator that determine the success or failure of the innovation, but rather the nature of the innovation itself. Leaders, indeed, have to comprehend whether the business model innovation under analysis is in compliance with the existing priorities of their current business model: such investigation is exceptionally important as it drives the future choices about the initiatives that have to be undertaken, such as implementing the present job or improving the financial performance.

For this reason, when determining if an opportunity has to be taken or not, managers should ask a few preliminary and crucial questions, like: "Does the new initiative meet customers' needs like our current activity does? What are the consequences of the implementation of the new strategy on our today's profitability?" and so forth. In sum, "*the greater the degree of alignment between the new and updated business model and the current one, the more is convenient for the firm to engage the change.*" (C. M. Christensen, T. Bartman and D. van Bever, 2016).

Organizations can innovate their business models by modifying their value proposition, the customer segment, the value distribution process or the mechanism through which they make

profits (N. Foss and T. Saebi, 2016); or even by recognizing new "white spaces", producing and testing new high-value ideas, approaching different/emerging/promising markets or building new systems, procedures and standards (Innosight, Strategy & Innovation at Huron, 2018).

Furthermore, an interesting insight is given by Massa and Tucci (2013), who recognize two different phenomena that could eventually lead to Business Model Innovation, and they are the Business Model Design, that is a tool employed by newly established firms when launching their business, and the Business Model Reconfiguration applied when renovating existing ones.

Therefore, to support the firm's growth and adapt to the rapid changes of the business environment, executives must be proactive, open-minded, bold and groundbreaking. In the process of innovating their company's business model, they can for instance integrate their existing offer with complementary products and services that would eventually add more value to their business, combine solutions to boost the market development, set prices that would lower the operating costs, encourage co-development to reduce development costs and so forth. (A. Arora, R. Bullivant and S. Bahtnagar, 2007).

2.2 *Sustainable* Business Model

The term "*sustainable* business model" has started spreading over the recent years, in tandem with the rising concern about financial, social and environmental issues affecting modern corporations. It has been usually brought into play when discussing the need of firms to overstep the mere provision of innovative products and services, seeking at the same time to "change the fundamentals of how a business makes money" (D.Bent, 2011).

Therefore, what do we precisely mean by *sustainable* business model? David Bent (2011), Director of Sustainable Business at Forum for the Future, has provided some valuable definitions of it, in order to shed some light on this relatively unfamiliar topic and motivate organizations as drivers of a sustainable future. According to Bent, *sustainable* business models must be "commercially successful" which means that they have to deliver a value proposition to the customer and be capable to make profits out of it; they must be "future oriented" in the sense that they have to be ready and prepared to succeed in a world of rising and unstable vivacity and unpredictable changes of commodity prices, and they have to be focused on "creating and supporting a sustainable society".

To be *sustainable,* corporations have thus to depend on particular external circumstances, generally connected to the purpose of promoting innovative, social and economic progress within respectable environmental boundaries.

Various are the rationales behind *sustainable* business models, depending on the objectives they intend to pursue. The researcher has detected, among many, some well-explanatory definitions provided by F. Lüdeke-Freund over the years, that appropriately fit the business case that it is currently under analysis. For instance, a *sustainable* business model is the one that creates long-term and extended customer value: "…it establishes competitive advantage through superior customer value and contributes to a sustainable growth of the company and the society…" (2010); or the one that identifies business model as a supporter of technological innovation: "…it happens to be a market device that overcomes external and internal barriers of marketing clean technologies; it is the business model that is able to connect technological characteristics and (new) commercialization approaches that both can succeed on existing or new markets." (2013).

In the context of business *sustainability,* an interesting insight is given by John Elkington, who, with his modern notion of the "Triple Bottom Line", wants to point out the importance for a corporation to extend its bottom line (i.e. the Net Income in the Income Statement) to not only profits, but also including social and environmental issues. This means that companies should be capable to maximize their proceeds being concomitantly concerned about people and the planet (the so called "three Ps", profits, people and planet) (Tim Hindle, The Economist, 2009).

To sum up, *sustainable* business models shall be employed by organizations in order to build a long-term value while at the same time taking into consideration their Corporate Social Responsibility (A. Jabłoński, 2015). Certainly, sustainable development is a huge and critical challenge that corporate managers happen to meet, also because of the limited resources they have at their disposal in doing so. But on the other hand, it is true that "strong dedication and purpose push growth and profitability", therefore actors in the business must constantly review and reconsider their sense of purpose and make sure that their organizations stick to it and pursue it accurately.

2.3 Value Creation and Value Capture

The intent of the research hereby conducted is to comprehend how the Swedish Fire Protection Association can add and ensure more and better value from the activities currently performed.

But what do we exactly mean by "value" and how do firms create and capture value for their customers, stakeholders and the society in general?

First of all, it is necessary to make a preliminary distinction between either *value creation* and *value capture* (or *appropriation*), given that the two concepts are often associated but they obviously have distinct meanings and explain different theories, and how this endeavor is handled both by enterprises and firms, whose primary goal is to make money from their operations and maximize their shareholders' value, and non-profit organizations whose mission, conversely, is to carry out activities that ultimately benefit the society as a whole.

In order to give details about what creating value really means, it is accurate to start by referring to Michael Porter (1980) who believes that the primary source of value is essentially to be found within the vertical chain of actors that constitute a business ecosystem (as well as all the activities undertaken to support and maximize competitive advantage), from the suppliers of resources to the firm itself, and from the firm provider of goods and services to the final consumer: value is thus produced by the interaction of all the three classes of player. Responding to the customers' needs usually appears as the main and sufficient mission for a firm that wants to generate positive value, and to some extent it is, but not to be left out is also the focus on the direct suppliers which the company relies on. Once the value is created, the strategic step for a firm that is willing to add more positive value is to encourage asymmetries between itself and its competitors (A. M. Brandenburger and H. W. Stuart, Jr. 1996).

The process of value creation presents peculiar traits depending on who or what is the source of such value. For instance, when this happens at an organizational level, i.e. when the source of value is the company, it can increase its value by developing or inventing new ways of doing business with the help of new technologies, new procedures or even new forms of raw materials (Porter, 1985). In fact, the phase of value creation within an organization consists of all those innovative and additional operations that are aimed at producing greater benefits and superior advantages for the customers compared to those they currently get and for which they are willing to pay (Lepak, Smith and Taylor, 2007).

And again, another clarification on the two notions is given by an author who wrote for the Venture CFO (2015) and who collected information following an interview with an entrepreneur. In such conversation, the entrepreneur in question offers his/her personal vision about what *value creation* and *value capture* processes are about: concerning the first one, the focus is to be put, for example, on "building up a network effect" which means being able to get more value attracting as many users as possible; "consolidating the brand", in the sense that

the stronger the brand is, the more customers will be willing to pay for it; and also "developing effective operations" selling goods and services at prices higher than the production costs; in this way, companies can get more value when their cost of producing is low.

On the other hand, *capturing value* also involves worthwhile initiatives, such as "monetizing consumers", "set clever prices" and "being able to make profits and remunerate shareholders". Of course, both the actions are vitally important within an organization, depending on which stage the company is currently at. For example, the company shall focus on creating value first, when it is at its early stage, and make it sustainable; later, it shall aim at capturing that value and make it last. Even in the latter process, the company still has to continue to create value, otherwise such value would not be capable to subsist in the long run.

In the case of non-profit organizations, the approach is clearly different. Whereas for-profits have as their main goal the one to create *economic* value for their debt and equity investors, as well as for their clients, non-profits aim at generating good *social* value for their donors, customers and the surrounding community. Indeed, unlike other enterprises, non-profits' management operations are mostly designed to produce "sustainable public value" for the general crowd.

By all means, such value differs depending on each organization's peculiar mission: in the case of the Swedish Fire Protection Association, for instance, public value is connected to making Sweden a more reliable country when it comes to fire safety, providing all the necessary activities and knowledge that educate people about being responsible for fire security and making sure that nobody gets hurt in a burning fire. In essence, the ultimate purpose of the organization is hence to save lives. Of course, operating in a continuous transforming and digitized environment pushes managers to constantly embrace new strategic approaches that will eventually deliver better or improved value up to the donors and the public authorities and down to the customers and the society (M. Weinberg, 2010).

2.4 Business Model Canvas

As previously described, the rationale behind business models is to represent and portray, in the form of a strategic analysis, how a specific organization "makes money" out of its activity: they thus explain how the firm develops and supports its competitive advantage in a fast-changing business environment, how much it has to be able to adapt to innovative ideas and

actions to be undertaken and who the relevant actors involved and gravitating around the corporation can be identified as.

The smartest intuition and mostly applied concept nowadays comes from the Swiss "business model guru" Alexander Osterwalder (P. Mulder, 2017) and the Belgian computer scientist Yves Pigneur, who developed back in 2010 the well-known Business Model Canvas, with the attempt to create a mapping tool that empowers managers to think up, design, test, revise and innovate their business models.
Such strategic management and entrepreneurial template is indisputably effective, for it depicts, in a visual language, "*how an organization creates, captures and delivers value*" to its stakeholders (Osterwalder and Pigneur, 2010). It is hence easy for the reader to have a first clear picture of the performance of the business in question thanks to the visual representation and for the manager to readily detect where lies the need for improvement.

It is a constructive and valuable framework consisting of nine building blocks, each one of them depicting the features of the corresponding nine elements that constitute a particular business. They are: *1) Key Partners; 2) Key Activities; 3) Key Resources; 4) Value Proposition; 5) Customer Relationships; 6) Channels; 7) Customer Segments; 8) Cost Structure and 9) Revenue Stream*s.

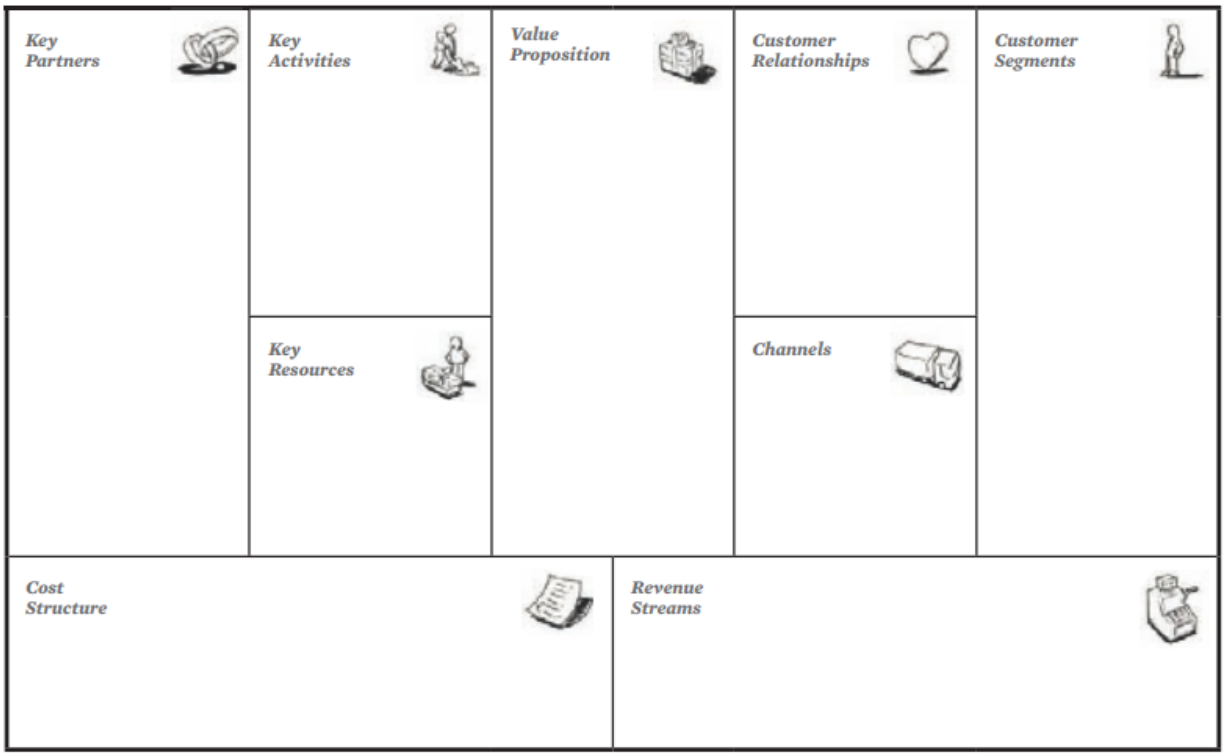

Figure 2.2 The Business Model Canvas. Source: Osterwalder and Pigneur, 2010, p. 44

2.4.1 The Offer - The Value Proposition

Osterwalder and Pigneur (2010) describe the Value Proposition building block as the combination of products and services that generate value for a targeted customer segment. The Value Proposition does not have to be necessarily one, but on the contrary, it is crucial to provide various Value Propositions and therefore bundles of products and services depending on the case specific clients, to be able to eventually meet each and every one's needs.

The Value Proposition is essentially the building block that the hereby research will mostly focus on, for it is the most important component of the business model that the Swedish Fire Protection Association is willing to innovate. For the sake of simplicity, the investigator will introduce two interpretations and applications of such concept analyzed from two diverse perspectives, that are: The Value Proposition Design (derived from the Canvas, 2014) and the Value Proposition for *sustainable* business models, which finds its best illustration in the work of Bocken et al. "A value mapping tool for sustainable business modeling" (2013).

Essentially, the Value Proposition as outlined in the Canvas characterizes uniquely each corporation, defining its core business and assessing its success or its potential failure (P. Mulder, 2017). It is in other words what the firm intends to offer on the market, after identifying what the customer wants and needs and conceiving goods and services that will eventually respond to their requests. The Value Proposition block is designed so that it answers the following questions, for example: "Which particular problem of the buyer are you willing to solve?" or "Which customer's need are you trying to fulfil?" and yet "What are the products and services that you want to offer?" and so forth (A. Osterwalder and Pigneur, 2010).

Many are the ways throughout which it is possible to create and deliver good value. For example focusing on *newness* or innovative ideas, i.e. creating and introducing something that did not exist before or that the customers did not perceive as there was no similar offering; improving the *performance* of a product or a service; making a product or a service accessible to other customer segments via proper *customization* (e.g. low-cost offers); upgrading and enhancing the *design*; exploiting the power of a specific *brand* to communicate an identity; lowering the *price* of goods, in order to solve a given problem starting from the investigation of the real and urgent needs of price-sensitive clients; making products and services *easier to use* in a more convenient way and reducing *risks* related to particular commodities (Osterwalder and Pigneur, 2010).

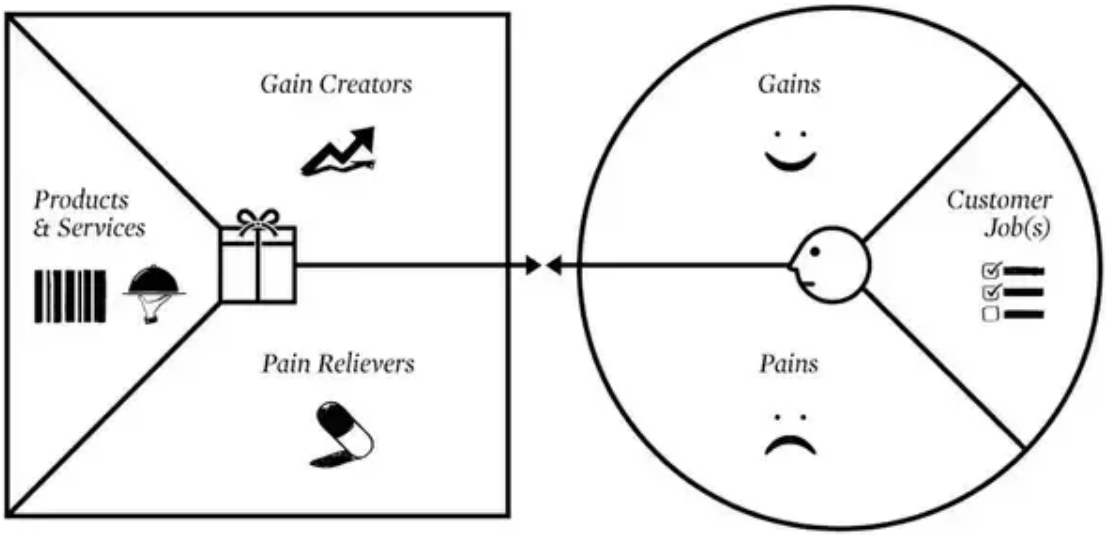

Figure 2.3 Value Proposition Canvas Source: A. Leshchenko (2014)

The Value Proposition Canvas or Design (2014) (figure above) is a significant template conceived by Osterwalder to indeed illustrate through a diagram the way by which organizations provide value to their targeted customers. It is comprised of two parts, the Customer Profile (on the right) and the Value Map (on the left).

The Customer Profile helps understand and detect which particular sector of clients the firm is willing to create value for. It is composed of the section "Customers jobs" that is a list of all the things that customers want to achieve in life and that they are trying to get done. Such jobs can be *functional*, when related to specific tasks, *social* such as the activity of impressing friends and colleagues and *emotional* like the desire to gain serenity or peace of mind. Then, there are the "Customers pains" which are negative results potentially arising from getting the job done, such as dissatisfaction, frustration, inability to overcome obstacles or face challenges, fear of problems and so forth; finally, the "Customers gains" highlight how customers measure their success for the job well done: positive and concrete outcomes, rewards and aspirations.

The Value Map, conversely, puts together a list of all the "products and services" which the organization aims at generating and building value from; afterwards, it outlines how such offerings can be "pain relievers" in the sense that they are able to eliminate, lower or mitigate what the customer identifies as their main problems or pains, making their life easier; and finally, the Map also explains in another block how the offering can be a "gain creators", which means how it generates, expand or maximize the results and benefits that the customer wishes to achieve. Certainly, the firm reaches a "fit" when both right side and left side are matched, i.e. when the Value Proposition is capable to tackle customers' jobs, alleviate their pains and produce valuable gains.

Overall, an adequate Value Proposition is the one that responds to the following questions:

- What is the offering of the company? i.e. what kind of products and/or services the organization is willing to sell?
- How can such offering maximize the benefits of the end consumers?
- What is the segment of customers which the company intends to deliver value to?
- What makes such offering unique?

And yet, in order to last in the long-term and be successful in the future, a unique Value Proposition shall also be clear and simple to understand ("*read and understood in about 5 seconds*"); it must state concretely what advantages the customers will get from buying and making use of the commodities and services provided; it has to specify why such offering is different or better that the one supplied by the competitors (P. Laja, 2018).

2.4.2 Value Proposition for sustainable business models

The Value Proposition for sustainable business models is defined by some authors (Anderson, Narus and Van Rossum, 2006; Ballantyne et al., 2011; Parguel, Benoit-Moreau and Larceneux, 2001) as the commitment of an organization to provide goods and services that will eventually benefit not only customers but the society as a whole, economically, socially and environmentally, looking both at the short-term proceeds and the long-term sustainability.
Bocken et al. (2013) have devised a particular value mapping tool that helps firms develop their value propositions that are specifically shaped for sustainability. The reason behind such choice lies in the need for some companies, object of a study conducted by the author, to incorporate sustainability within their businesses, which means to ensure that their offerings (outlined through the value proposition) deliver and provide social and environmental outcomes too, other than merely economic ones like traditional firms: in particular, this mission is indeed inherent the world of non-profits and NGOs.

The Value Mapping Tool in support of sustainable business models exploits a qualitative approach to the analysis of the value, because its main intention is to encourage and promote idea generation and implementation, therefore a quantitative method would not be fitting.
The major goals of such template are mostly three: 1. figure out the positive and negative elements of the value proposition related to the value network (i.e. society, environment, customers); 2. detect where there are contrasting values (e.g. when a positive value for one stakeholder leads to a negative effect on another stakeholder's value); 3. pinpoint areas of the

business model that can be innovated, upgraded and boosted to reduce negative performances and increase stakeholders' benefits.

Figure 2.4 illustrates graphically the Value Mapping tool. It is a large circle, made in turn of four smaller circles, each one of them representing four different connotations of value in order to simplify the methodical examination of value. Around the main circle gravitate the stakeholders, represented in specific segments. Lastly, the tool demands that the organization be network-oriented, rather than business-oriented, i.e. focusing on the optimization of value for the network of stakeholders.

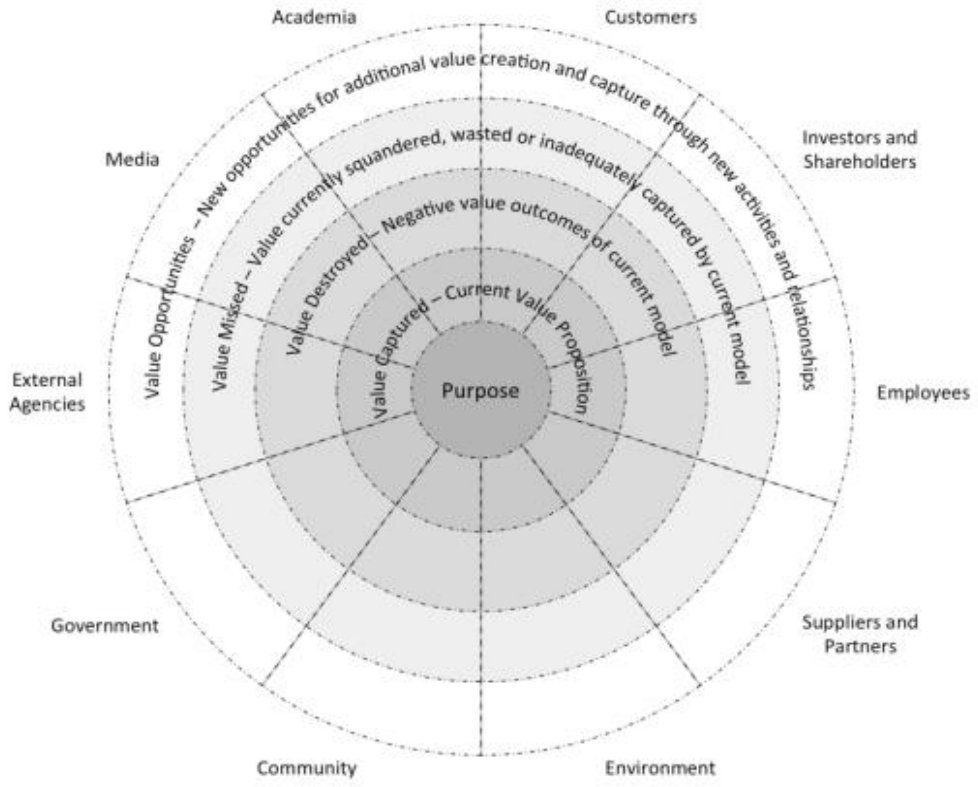

Figure 2.4 The Value Mapping tool for sustainable business models. Source: Bocken et al., 2013.

2.4.3 The Customer - Customer Segments, Customer Relationships and Channels

The Customer Segments block answers the following questions: "For whom are we generating value?" and "Who are our most relevant target clients?". Companies often deliver products and services to more than one customer group: it is thus convenient to divide the panel of clients into different segments, depending on their common needs, preferences and similar behaviors.

Customers are the ultimate target of an enterprise, for profits or not for profits that is, and together with the Value Proposition represent the core of every business model: without profitable buyers no company would have reason for being. It is hence crucial to identify the various customer segments in order for the company to better understand each group's requirements and needs and strive to meet them. Eventually, this will lead to buyers' satisfaction that in turn will result in a good value proposition.

The Customer Relationships describe what kind of relationships a company determines with each group of customers, which means how the customers communicate with the company through the sales, if the two players interact over the web or if the consumers have an appropriate personal contact that they can call or see, and so forth. It is incredibly important to split up the clientele into stand-alone segments if the clientele happens to be quite broad: this way, the organization finds it easier to properly address the needs of each group of consumers and thus ensure a strong and lasting relation with them.

The Channels building block describes the way by which organizations connect with and reach their clients, with the ultimate goal to deliver their value proposition. Channels in question are the Communication, Distribution and Sales Channel where the enterprises communicate and engage with their final shoppers. For instance, the location where the product or service can be purchased, or the delivery operations are significant connotations of the activity performed by the Channels.

Furthermore, it is advisable to provide both offline (shops) and online (web shops) channels, given the high competition on the internet marketplaces today due to rising innovation and digitalization.

2.4.4 The Infrastructure - Key Partnerships, Key Activities and Key Resources

Key Partnerships is the network of suppliers and business partners that make the business model function. Both start-up firms and established companies find it convenient and fundamental to build valuable alliances with strategic actors in the industry, either to combat the competition and to share knowledge and expertise. Partnerships can be in the form of coopetition, joint ventures or arrangements between buyers and suppliers.
It is crucial for the corporation to figure out its Key Activities, with the objective to deliver a good value proposition. It is not only about the mere production of commodities and service,

but also all the subsidiary core activities that surround the business: the attention and control of the quality standards, having a problem-solving attitude, networks and beneficial linkages etc. Shortly, they represent the set of operations and activities that a company has to undertake in order to perform successfully.

The Key Resources are instead the tangible and intangible means and assets that an organization needs to keep itself alive. They are in nature physical (like plants and equipment), intellectual (property rights and knowledge), financial (investments, funds and flows of income) and human (staff and employees). Such resources enable enterprises to achieve and compete in specific markets, maintain relationships with the customers and most importantly make profits.

2.4.5 Finance – Cost Structure and Revenue Streams

Understanding the Cost Structure allows the company to individuate the minimum turnover to make money. This building block points out all the costs that arise when doing business: generating and providing value, economies of scale, constant and variable costs, cost advantages and costs related to generating proceeds.
To conclude, Revenue Streams account for all the cash flows produced by the business activity and coming from the different Customer Segments. The most important question that a firm should ask when determining the value proposition is "For what value our clients are actually willing to pay?", so that it can establish diverse Revenue Streams for each Customer Segment. And yet, this block of the Canvas helps measure, for instance, how many customers the organization needs on an annual basis to create profits. Revenues are not only those resulting from the sale of goods and services, but they can also be in the form of licensing, advertising, subscription fees and so forth (P. Mulder, 2017; Osterwalder and Pigneur, 2010; Hossain, 2014).

2.5 Portfolio of Business Models

The Swedish Fire Protection Association is responsible for three main activities of monitoring and security, represented by three pipes or blocks which are the electrical inspections, the fire detection and the sprinklers (fire inspection).

Each one of them has its own business model and they do not communicate to each other: here lies the biggest need of improvement. Indeed, the company requires a uniformed business

model that could handle and run all the three blocks (and potentially other businesses in the future).
Certainly, combining three business models, like in this case, and turning them into a single one could end up being a tough challenge, not to mention the complexity related to it. Moreover, if the business models are complementary, they would strengthen one another and make unachievable plans attainable and profitable (Casadesus-Masanell and Tarzijàn, 2012).

For this reason, the three supplementary businesses (or blocks) would ideally necessitate distinct business models which, by the way, perform in tandem. The solution to such issue would be to develop a portfolio of business models. Today's companies control and manage different business models at one time, but frequently it is hard to assemble them all together: on the contrary, it is crucial for leaders to understand the importance of the strategic benefits and inputs of each and every element of their portfolio of business models.

Usually, organizations choose the path of business model portfolio when their business activity comprises at least two ways of generating and providing value: doing so, they can succeed at having a higher performance by combining resources and expertise to cope with the external contingencies, and sustain their competitive advantage (Aversa, Haefliger and Reza, 2017).

What actions and measures can corporations take in order to ensure that their portfolio of business models is strong and successful?
First of all, it is high-priority to focus on the customer segments which the company is willing to deliver value to. It is fundamental for the executives to investigate where there is the possibility to lower the costs and at the same time provide greater advantages that would respond to customers' needs, where the lack is. Second, companies should leverage on processes and common resources coming from the different branches of business, and hence business models: i.e., right where there is a window of usefulness in exploiting and sharing a mutual asset (tangible or intangible that is, like a technology) the firm must employ it on a broader scale, creating further benefits and perks for the organization as a whole.
And lastly, the portfolio should be in-line with the outer trends: for instance, the advent of digitalization and the technology in general surely constitute a more than valid justification to change or innovate an enterprise's business model (K. Plantes, 2012).

2.6 Business Model Innovation and Digitalization

In the research, the focus will be narrowed down to the branch that is the fire inspection (sprinklers) and subsequently on the business model that backs up such specific activity. To get started, the Research Center for Business Models in the Digital World (2018) describes "digitalization" as "*the transformation of processes, services and products resulting even in the transformation of entire entities and/or business models, by making use of new information and communication technologies, with the aim of generating value efficiently and effectively*".

The digital transformation qualifies itself as a brand-new way by which enterprises operate and compete on the marketplace, driven by the huge growth of the new advanced technologies, such as cloud-based systems and Big Data analytics (to cite a few) that have significantly speeded up the rate at which companies do business and deliver their offering to their customers. Many are the reasons behind the choice to move towards digitalization: for instance, to expand into new markets and industries and approach new customers, accelerate the way products and service are developed and delivered and/or to generate a more attractive value proposition for the customers.

Needless to say, that such a radical change would unavoidably amend the business model of a company in a considerable way, bringing with it risks and challenges. Literature and research first, and organizations and their managers after, must be accurately informed and supported in the process of embedding digitization within their business models, in order to operate successfully and profitably (Research Center for Business Models in the Digital World, 2018).

In the peculiar case of this study, the aim of the Swedish Fire Protection Association is to orient itself towards digitalization by making the currently physical and manual fire inspection partly automated, with the help of sensors (in support of the regular sprinklers) and the installation of a computer-based system that would collect and gather data and translate it into information for both the company and its major customers, the insurance companies.
The ultimate goal is to lower the costs related to the manual fire inspection and risk valuation and thus add more and good value for the customers and the entire society.

2.7 Conceptual Framework

The discoveries that come from the literature review have been hereunder summarized and graphically illustrated in the Value Proposition building block, in order for the researcher to conduct a thorough analysis at the end, looking for matches between what has emerged through the theoretical investigation and what the new *sustainable* Value Proposition might look like according to the empirical findings.

At this stage of the research, the Value Proposition building block of the Canvas has been employed to describe, from a general perspective, what the Value Proposition of a non-profit organization responsible for fire safety and electricity security would look like in accordance with the theoretical discoveries. In the Analysis, conversely, the author will apply the Value Proposition Design as the new theoretical model that, according to the researcher, has been chosen inasmuch properly representing *how* the organization intends to create value for its customers.

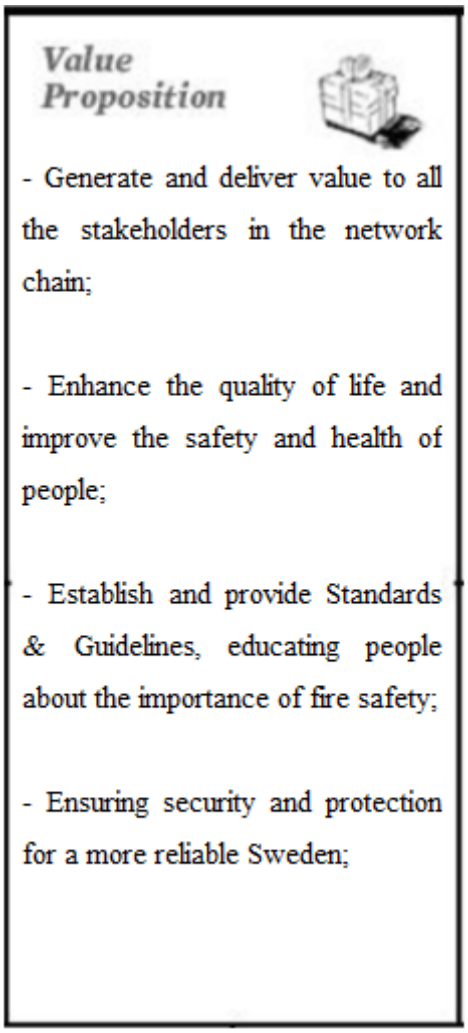

Figure 2.5 Value Proposition according to theory. Source: compiled by the author.

Going back to the questions outlined in the chapter 1.3 of the Research Question, the above Value Proposition is clearly not suited to answer the followings: "*How can such offering maximize the benefits of the end consumers*?", or "*What is the segment of customers which the company intends to deliver value to*?", or even "*What makes such offering unique*?".
This impracticality leads to the utilization of another framework, that is indeed the Value Proposition Design that will be applied in the Analysis, accordingly.

Chapter 3

METHODOLOGY

The chapter that follows will aim at giving the reader an accurate understanding of how the research is carried out from a methodological standpoint. It is hence important to emphasize the linkage between the object of the investigation and the design preferred to perform it. The hereafter paragraphs will thus illustrate the *research strategy* undertaken, the *research design* employed in the form of a *single case study* and the *research quality* applied to a qualitative research.
Additionally, a depiction of the Systematic Literature Review will also be provided, as well as an explanation of the *research methods* exploited to collect the empirical findings, making a distinction between *primary data* and *secondary data*.

3.1 Research Strategy

When dealing with Business Research, which is the academic research undertaken by individuals to get useful data that are functional to the field of business and management and that have a social focus, epistemological and ontological considerations can be applied.
Such peculiar tool is employed when providing effective instructions on how to run a research and what the general procedure is about.

First of all, it is viable to make a preliminary depiction of what "theory" is and means. Theory is where the research starts from, it is what drives and influences the process of collecting and examining data and it is somehow embodied in the literature. When referring to the relationship between theory and research, like a bridge that connects the two fields, a further distinction can be drawn between two types of theory, which are the *deductive* and *inductive* approaches: the former is employed when there is the need to get to a specific conclusion starting from the analysis of a general precondition; it is grounded in theory and leads to the formulation of hypotheses/assumptions through samples and data. The latter is instead when from a certain premise we arrive to general conclusions: it starts from the empirics and ends up in the build of theory.

Then, we have the distinction between the two paradigms *objectivism* and *subjectivism*: the objective point of view is when the analysis is based on real processes, structures and facts; the subjective one is when a high degree of interpretation comes from the individuals who run the analysis.

Finally, a differentiation between two research methods/strategies also needs to be done, which are the *qualitative* and *quantitative* researches: the first one emphasizes words more than numbers or quantitative data, whereas the second one is employed when dealing with measurements and data collection. For this study in particular, the researcher will operate by using a qualitative research and in turn adopting an inductive approach, whose structure will be discussed later in the next chapters (Bryman and Bell, 2011).

3.2 Systematic Literature Review

When a project gets started, and after finding and explaining the research question(s), one of the most important and essential tasks to do at a preliminary stage is to seek for the theoretical background and start composing the literature review. This process involves understanding how to put together the key ideas and to initiate a research on the basis of a preferred and selected area of interest. The literature review sets the foundations on which you validate your research question(s) and build up your research framework (Bryman and Bell, 2011).

When searching for the theoretical background, in the form of articles, publications and/or chapters from academic books, I made use of various databases and other sources of literature. For instance, the examiner has referred to the web page of the University of Gothenburg's Library or to popular databases like Scopus and Web of Science.
Also, Google and Google Scholar have been exploited as main sources of academic papers.
Moreover, the author was provided with materials and documents from both internal sources at the company and external sources.

The following table displays a set of *Inclusion and Exclusion criteria* which the investigator has narrowed her analysis on, as well as a list of the *Keywords* employed in the quest for the literature background.

Inclusion criteria	***Exclusion criteria***
Sensor-based Fire Inspections	Economic effects of *sustainability* on Business Models
Implementation of database for data sharing	Pricing strategy for new products and services on the market
Sustainability as a long-term oriented Value Proposition	Electrical Inspections
Sandbox Model from a general and descriptive viewpoint	Sandbox Model from a technical and practical viewpoint

The Keywords used in the collection of information and findings are: *business model and business model innovation, sustainable business model, value creation and value capture, business model Canvas and value proposition Canvas, portfolio of business models and* finally *business model and digitalization.*

3.3 Research Design

A Research Design is nothing more than a framework (or structure) that the investigator selects among many, that best fits the object of his/her study, in order to be assisted in the gathering and examination of data.

In the specific case in question, the researcher has chosen the *single case study design*, for it consists in putting the focus on a specific "case" i.e. an organization, that is the Swedish Fire Protection Association, that indeed represents the object of my investigation.
The *case study* method is broadly used especially when dealing with qualitative research, in the form of participant observation and unstructured interviews, since it helps develop an accurate and thorough examination of the case, and therefore when the aim is to build up theory starting from the empirical and experimental findings.

There are some discussions regarding the case study design, for example the one concerning the *external validity* or *generalizability*: how can a sample of an individual case be

representative enough to generate findings and insights that could be possibly applied generally to other cases? In fact, it cannot. The case study approach is exploited when the purpose of the research is to extensively examine one particular object, whatever its nature is, underlining its uniqueness and providing the understanding of its elaborate features: for this reason, it is debated that rather than *generalizability, particularization* is the major power of case studies (Bryman and Bell, 2011).

Another limitation of such pattern that has been brought up by Maoz (2002) is the "lack of methodological considerations": meaning that the researcher finds himself to be free from any systematic procedures and methodical techniques when dealing with case studies, whose cause lies in the absence of organizational guidelines according to Yian (2009).
In fact, semi-structured and unstructured interviews used in case studies, when following a qualitative approach, can be an example of how the investigator appears to be free to choose the path and direction of his project, without responding to schematic structures (Willis, 2014).

In conclusion, the application of the case study design to this work appears undoubtedly to be the best configuration, given that the aim of the research is to develop a *sustainable* Value Proposition for the Swedish Fire Protection Association that is one-of-a-kind organization, and not to apply the results to other cases/entities: *generalizability* is thus not an influencing factor.

3.4 Research Methods to Collect Data

From a methodological point of view, the most effective and popular strategies deployed in business research, especially when dealing with the collection of data, are essentially two: the *quantitative* and the *qualitative approach.* As outlined before, the two have diverse epistemological assumptions and differ in many ways, have distinct purposes and lead to different outcomes.
The first, major distinction is that quantitative research relies on numbers, measurements and quantitative data, whereas the qualitative approach tends to emphasize words and aspects of the human reality; the quantitative method employs a deductive attitude when applying theory to the business research, that is starting from general assumptions it gets to a particular conclusion, while conversely the qualitative one entails an inductive approach, which consists in starting from a specific precondition and getting to general conclusions; finally, the former strategy requires more like an objective point of view of the external reality, whilst the latter demands a subjective, personal interpretation of the social facts.

Albeit different, it is not rule that one excludes the other: in fact, the two approaches can be combined and simultaneously applied, giving birth to a *mixed methods research* (Bryman and Bell, 2011).

Bryman and Bell (2011) additionally state that the quantitative research is usually carried out in the form of structured interviews and surveys/questionnaires to be compiled. On the other hand, in the process of working on the peculiar case of this research, the investigator has operated by following a qualitative approach, specifically in the form of semi-structured interviews.
In this respect, a classification of the data that has been gathered throughout the investigation, that are *primary data* and *secondary data*, will be provided. The former relates to all the information and findings produced by the researcher for the first time (i.e. the insights collected during the interviews and face-to-face meetings); the latter refers to documentation and material already produced by others which the author gains knowledge about in the course of the study.

3.4.1 Primary Data

The primary source of data is represented by all the empirical information, details, opinions and perspectives resulting from the meetings, focus groups, interviews and workshops that the examiner has attended during the investigation period. The aim is to understand each and every interviewee's role within the enterprise and what relationship the company does have with fire security and safety; also, to comprehend their points of view regarding what they do perceive as their company's main necessities, current and future challenges, opinions about the transition to partially conducted fire inspections and the implementation of a database for the data sharing and so forth, in order to conduct an accurate analysis at the end that will help develop a sustainable Value Proposition for the Swedish Fire Protection Association.
Since the organization object of the study sees a lot of stakeholders involved in the business, it is exceptionally important to question them and seek for their opinion so that accomplishing the ultimate task will prove to be a lot easier.

The people that have been interviewed during the research period and the company they work at, are listed below in a chronological order; also, the author has chosen to keep them anonymous in order to respect their personal integrity.

Interviewee	Position and Company	Type of Organization
Respondent 1	General Secretary at SBF	Swedish Fire Protection Association
Respondent 2	Doctoral Student at Division of Fire Safety Engineering at the University of Lund, Sweden	University
Respondent 3	Director, Research and Data Analyst at NFPA	North American Fire Protection Association
Respondent 4	Product Specialist at Verisure	Fire Alarm company
Respondent 5	IT Consultant at Monotio, currently working on projects for SBF	Swedish Fire Protection Association
Respondent 6	Development and Reports at Folksam	Insurance company

Moreover, the author has shared the outcome of two interviews with two of her colleagues who have been working on a similar project and that have provided her with valuable and useful information resulting from the interviews by them conducted.

The people who have been interviewed are the following:

Name and Surname	Position and Company	Type of Organization
Respondent 7	Chief Innovation Manager at Länsförsäkringar	Insurance company
Respondent 8	Business Development Director at Sector Alarm	Fire Alarm company

The semi-structured interviews, performed for the most part over the phone, one of them via Skype and the first preliminary meeting happened to be face-to-face, were arranged in a way that a set of questions was prepared in advance, the so-called *interview guides* (Appendix II), and the interviewees were then allowed to freely give their responses and express their opinions,

sometimes leading this to the formulation of impromptu questions about topics that still were worth exploring and discussing.

On average, they all lasted between 25 and 35 minutes, the people that initially have been contacted were seven, as the researcher decided among a list of stakeholders those that she believed could help her gain useful insights through the research, out of whom five have responded, one informed that he was not interested in being interviewed and another one suggested that the author share information with her colleague who previously interviewed him.

A first preliminary email was sent and two days later a reminder was dispatched; in some cases where they did not respond, they were thus contacted on the phone.
The content of the interviews that are part of the primary data will be presented and described in the next chapter.

3.4.2 Secondary Data

The secondary data are exemplified by reports and journals that the author has read on the company's website and its partner NFPA's, additional documents and material given to her by reference contacts within the company, internet research, published data and records coming to the public sector at stake.
Moreover, the investigator had access to two public reports related to projects that the North American Fire Protection Association (NFPA) has worked on and is still working on today, which are somehow similar to what the organization object of the case study is willing to pursue in the long run: they were thus extremely helpful and interesting to examine at the same time.

3.5 Research Quality

Determining and evaluating the quality of a qualitative research essentially consists in securing and consolidating the *validity* and *reliability*, both *internal* and *external*. However, many discuss that these criteria are more suitable for the quantitative research, as they assess the consistency of the measures and indexes employed in the study.

It is still feasible though, to adjust and tailor such criteria to the qualitative research. For instance, Mason (1996) claims in her book that the *internal validity* concerns whether "you are observing, detecting and measuring what you say you are"; *external reliability*,

conversely, refers to the grade of replicability of the studies and the results (L. Leung, 2015), which means that an independent researcher, in replicating the study, would eventually come to the same conclusions. For this reason, such criterion appears to be quite low, given that qualitative research employs *subjectivism* as aptitude towards the study.

Based on the assumption that the research here at hand is in the form of a single case study and it is aimed at investigating the peculiarities of the chosen organization only, the *external validity* turns out to be somewhat limited. Such mentioned criterion is strictly related to the notion of *generalizability*: the degree to which the empirical findings collected throughout the research can be generalized to other scenarios.
For this reason, *external validity* in a single case study proves to be quite low, given that the founding principle is *particularization* and not *generalizability*, as previously stated.

On the other side, *internal reliability* relates to some extent to the concept of *internal consistency* of the social facts observed, i.e. whether another independent researcher, in reviewing the data, would eventually come to the same conclusions. Also in this case, such criterion happens to be quite low for the same reason as for the *external reliability*: *subjectivism* leads the researcher to be slightly bias towards the investigation by his/her personal vision and understanding of the social reality.

In this respect, the collection and gathering of the empirical data has been done by means of semi-structured interviews, as primary source of data.
In order not to undermine the consistency and cohesion of them, all the interviews were tape-recorded upon the interviewees' approval and transcribed right after, so that any of what was said got lost and the errors arose in the process of assessing and evaluating the sources were minimized.

Chapter 4

EMPIRICAL FINDINGS

This chapter is intended to provide the reader with a thorough depiction of the key findings obtained during the research. Except for the first two paragraphs, which outline and describe the current operating status at the organization and the ultimate objective to innovate its business model and deliver more value, all the empirical data has been divided into two sections, the *primary sources of data* and the *secondary sources of data*: the former is represented by all the information and insights collected during meetings, focus groups, workshops and semi-structured interviews with different stakeholders; the latter is findings coming from reports, journals, publications and projects of research mainly related to the National Fire Protection Association (NFPA). The semi-structured interviews are categorized by the nature of the interviewees, i.e. their company and the industry which the firm operates in.

4.1 Current Operating Situation at The Swedish Fire Protection Association

The Swedish Fire Protection Association is a non-profit organization, specifically an NGO, established in 1919 almost one hundred years ago in Sweden. It is therefore a very traditional company operating as a monopolist in the public sector, facing challenges and difficulties to a large extent related to the increasing and unceasing development of technology and digitalization. At the very start, the organization was only responsible for determining and fixing rules and regulations for good fire safety and protection, given that the country failed to possess adequate guidelines at that time.

In 1935, when electricity began to spread among residential areas and the population was afraid because nobody had knowledge about how to control it and manage it, Gustaf V King of Sweden decided that the Swedish Fire Protection Association take care of it and cope with it. Initially, the pipe of *electrical inspections* was then built up for the monitoring and check-up of electricity all over Sweden, to ensure safety and security in every household and public place. Subsequently, in 1990 the Insurance companies (major and most important customers of the organization) felt the need to dispose of a *fire detection* system too but realized they did not

have the knowledge to conceive it themselves and hence turned to the Swedish Fire Protection Association to get intervention.

Nowadays, the organization controls and supervises three different blocks, that are the *electrical inspections, fire detection* and *sprinklers,* but they do not communicate with each other. Moreover, given that the organization does not have much experience with business modeling, the three areas of business are represented by different business models: the company is indeed willing to uniform the three activities and dispose of a unique business model that can handle and run concomitantly all the three blocks.

The organization today administers 2,000 operations and thus owns several departments, has a turnaround of 30,000,000 kr (equal to € 3,000,000 circa) and the proceeds are spent in research, given that as a non-profit it does not invest in stocks.
With regards to electrical inspections, the company relies on an "object database" that is a system that collects and displays almost 45,000 objects (facilities) inspected every three years, i.e. 15,000 inspections per year, and their level of riskiness: this way, the insurance companies can look if a particular facility has been inspected and if it is risky, but does not exist a similar platform for the other two blocks.

The firm is provided with 230 inspectors who receive accreditation after paying an annual fee of 22,000 kr (€ 2,200) as a means of being able to work in the system; at the same time, the company pays them certification and training fees.
Considering that the operative inspectors in the system are 230 and the annual fee paid by each is 22,000 kr, 50% of the total amount (equal to 5,060,000 kr circa, € 506,000) is represented by costs for the company. The outstanding 50% consists instead of money that the firm obtains from the insurance companies. The electrical inspections in total cost 10m kr for the company, which is a massive amount.

The actors implicated in the system here mentioned are the following:

1. The Insurance companies;
2. The Insured;
3. The Swedish Fire Protection Association;
4. The Inspection (engineering) companies;
5. The Inspectors;

There exists an agreement between the Insured and the Inspection company, for which the Inspectors report the results of the electrical inspections into a computer-based system and the

costs are hour-based: this means that if an inspection takes ten hours, then the insured, that is the net payer, has to pay for ten hours.

When it comes to fire inspections, and hence in particular those related to the activity of the *sprinklers* (i.e. water-based fire protection systems) the inspection processes are slightly different. First, the company does not have an object database that collects and stores data, as it does for the electrical inspections, and this is cause for a significant disappointment and dissatisfaction for the insurance companies, for they are not able to get proper information relative to the facilities on which the inspections are conducted. Second, the fire inspectors only receive certification fees issued by a certification company (and not the Swedish Fire Protection Association, as it happens for the electrical inspectors). And third, as for the electrical inspections, they represent a huge cost for the organization: assumed that 15,000 electrical inspections are carried out per year, and the total cost of them is equal to 10m kr, every inspection costs 650-1200 kr per hour circa (€ 65-120).

Just a small aside on the *sprinklers*: they represent an efficacious device that helps reduce and minimize the possibility and gravity of a potential fire in a building. They are in the insurance business because when facilities get damaged or even destroyed, the Insurance companies have to face severe costs, based on the level of risk recorded, and pay the Insured back.
For this reason, Insurance companies are truly interested in a good performance of the fire sprinklers systems, and at the same time they wish they could better assess the risk before the damage occurs (M. Lehner, 2017).

There is noticeable need of improvement and transformation in the current situation, in order to either meet the customers' needs, deliver more value and be more efficient and cost effective.

4.2 Transformation and Innovation within the Swedish Fire Protection Association

4.2.1 Sensor-based Inspections and Digital Platform for Data Sharing

The major and most serious concern of the Swedish Fire Protection Association is represented by its customers, the Insurance companies, which as outlined in the previous paragraph, are not pleased and satisfied with how the organization is running and managing the fire inspections (in particular the *sprinklers* pipe) because unlike electrical inspections, they cannot rely on an

object database that collects and gathers data and thus they are not able to get any feedback nor proper information on the facilities inspected at the moment.

What the company is willing to pursue is essentially a transformation of its business model, with a distinctive emphasis on the Value Proposition building block, with the aim to deliver more and good value by providing more data. This way, not only the Insurance companies can have access to a larger amount of information, but also a lot of costs would be saved and expenditures substantially lowered.

For instance, practically exemplifying: if the fire inspections were made partially automated (some of the job would still be carried out manually from the inspectors) and hence the number of inspectors was reduced from 230 to 100, the costs of the inspections would decrease from 50% to 25% circa (the remaining 50% is money coming from the insurance companies, as said before).
For this reason, sensors and other technologies like remote installations would be a great possibility to automate fire inspections. It would mean to benefit from self-report sensor-based technologies that could support the *sprinklers* in the process of getting more details on the inspections.

The most important customers are the Insurance companies, that are currently not paying the organization in other areas but only for the electricity inspections: there is no money transformation at the moment, given that the Insurance firms are not providing enough financial resources. Moreover, the organization is also in charge of governmental inspections, and this means that even such institution could have the opportunity to exploit technology to be aware of fire risks.
More involvement in the society is needed. Nobody can challenge the Swedish Fire Protection Association because of their brand and their position in the ecosystem: being an NGO makes it indeed socially stronger and more powerful.

How can the organization innovate and add more value to the business? The idea is to hence build up a digital platform where the partners, as well as the customers and other relevant stakeholders get the chance to work in together. The business would therefore grow if the insurance companies could have access to a computer-based system entitled to share data.
This intent is indeed part of a bigger and more complex project that the company is currently working on, that is the Sandbox model: a huge database for the Big Data sharing in fire safety to secure machine and Artificial Intelligence (AI) learning for better and proactive safety.

For this reason, the project being investigated in the present case study, specifically linked to the area of *fire inspections*, belongs to the macro project of the Sandbox.

If the organization switched to sensor-based inspections, there would be a combination of digital and manual operations, assuming that the flow of information comes from the sensors, but at the same time part of the job would still be conducted manually.
The sensors, in support of the *sprinklers*, would then be capable of evaluating the risk before the *sprinklers* go off. In fact, the insurance companies receive money from the Insured and pay it back if the fire incident happens. However, if the risk is higher than the costs, the Insurance companies would report a huge loss.

Because of this, the organization requires a system where it is possible to identify where the risk is and therefore detect it instantaneously, by leveraging on a database that generates and discloses information and displays the type of risk. It is thus powerful and effective to rely on a more automatic system, with the aim to reduce the costs related to the risk evaluation.
The technology (e.g. sensors) in question would be capable of remotely listening to the system and immediately giving the electrical signal that indicates the presence of a problem somewhere.

Of course, bringing together all the different customers and making them share their data into a unique database is unquestionably not an easy procedure, especially because of the so-called General Data Protection Regulations (GDPR) that is a regulation in force in EU on the protection of personal data collected and stored. For this reason, not all the Insurance companies are enthusiastic about the project given that their data, once shared in the platform, would automatically go into their competitors' hands.

The Swedish Fire Protection Association does care about their clients (almost 80 Insurance companies, representing 95% of the entire market, have agreements with the organization) as well as their partners, and it does want to deliver good value and make each and every one of them happy and satisfied.

Overall, the Swedish Fire Protection Association truly believes that business is about relationships. The key partners and customers are in the ecosystem because they think it is good to be there. Cooperating and depending on each other is the core value to be successful.
For this reason, the organization is willing not only to deliver value to the society as a whole, but also importantly to its most relevant stakeholders.

It aims at doing so by providing them with more data and information, because the more data is available, the more they add good and sustainable value.

4.2.2 Business Model Innovation within the Swedish Fire Protection Association

By transforming the business with the purpose to move towards digitalization and generate more value for its customers, the organization is thus willing to change and innovate its business model, more specifically, its Value Proposition.

Previously in the text, it has been stated that the company does not have much expertise with the business models, and all the three different areas of activities (i.e. *electrical inspections, fire detection* and *sprinklers*) are supported by distinct business models.
The attempt of the firm is therefore to uniform all the three different blocks (pipes) under a unique business model that could potentially handle and run either such three areas of business today and other eventual operations in the future.
It is hence about trying to deliver more and good value, by innovating the entire business model.

In this regard, the examiner has proposed, instead of disposing of a unique business model to monitor and manage three diverse areas of business, a *portfolio of business models* (please refer to Chapter 2.5 – Portfolio of Business Models) given that "if the business models are complementary, they would strengthen one another and make unachievable plans attainable and profitable (Casadeus-Masanell and Tarzijàn, 2012)"; also because "frequently it is hard to assemble different business activities all together: on the contrary, it is crucial for leaders to understand the importance of the strategic benefits and inputs of each and every element of their portfolio of business models (Aversa, Haefliger and Reza, 2017).

4.3 Primary Sources of Data

4.3.1 Focus Group at First To Know and Introductory Meeting at The Fire Protection Association

When the researcher was first assigned the project by the consulting firm First To Know Scandinavia AB, based in Gothenburg, she together with other three engineering students from Chalmers University of Technology and two colleagues from the School of Business at the University of Gothenburg had a first, preliminary meeting at First To Know office in order to get adequate information on different matters.

The meeting took the form of a focus group, where all students, the Project Manager and Business Developer of the company, and the CEO, sat together to discuss practical and informative details concerning the different projects that each one of us was going to work on. The information that the students received was related to the nature and fundamentals of each project, the objectives that the company their client (The Swedish Fire Protection Association) was willing to achieve, the method by which they should work and the contact persons for each one of them depending on the project assigned.

In this regard, a first phone call was made to the Research Manager at The Swedish Fire Protection to introduce themselves and receive further background instructions and guidelines. Following the initial focus groups, the other researchers and the author of this work met at the office several times, to get feedbacks on the status of our work and to provide updates to the Project Manager.

Subsequently, the investigator herself went to Stockholm to meet the General Secretary at the Swedish Fire Protection Association headquarter to discuss the project more in detail.
She was given utterly useful and valuable insights on the history of the organization, the current status of activity and what their purpose was about regarding the digitalization of the fire inspections.
The intel obtained and addressed have been presented in Chapter 4.1 and 4.2.

4.3.2 Semi-structured Interviews

The following paragraph will outline the most significant takeaways from the interviews that the examiner has conducted during the investigation period. It will be structured in such a way that a first introduction of the company will be provided and then specified will be the nature of the relationship with the Swedish Fire Protection Association and their involvement with the organization. The list is in a chronological order.

Purpose of the interviews has particularly been to understand the various stakeholder's needs and wishes, the major challenges that they are facing today and potentially in the future, their suggestions regarding the process of digitalization of the fire inspections and personal opinions about the implementation of a computer-based system for the data sharing, which they could possibly be part of. All the key findings are intended to facilitate the filling of the different segments of the new *sustainable* Value Proposition that will be proposed at the end.

The semi-structured interviews, recorded upon the interviewees' approval, have not been verbatim transcribed. This is because it was more practical and time-saving to capture the most relevant and useful statements and make them object of examination and assessment. The *interview guides*, that contain different questions depending on the type of stakeholders, will be disclosed in Appendix II.

The University of Lund

The Swedish Fire Protection Association collaborates with the Universities on several projects of research. In order to gather valuable insights for this peculiar study, the researcher got in contact with Respondent 1, Doctoral Engineering Student at the Division of Fire Safety at the University of Lund, with whom she has mainly discussed the technical implications of sensors and the implementation of such technology.

Respondent 2 offered an update on the current operations that are being carried out in relation to the activity of *monitoring the pressure from fire pumps.* He suggested, for instance, that it would be definitely good to increase the level of monitoring of the pressure coming from the fire pumps, but at the moment they have to comply with a threshold. There exists an *error alarm* that activates when the pressure goes above a certain level, and it would be useful to improve the monitoring in order to provide more information. But still, it is impossible to base inspections on that value.
It seems difficult to have something to monitor because there is no specific signal to measure constantly: once the fire turns up, it spreads.

In the database, it would be feasible to collect *error alarms* (one for a higher urgency, another one for a lower urgency) and the frequency of errors for specific urgencies can also be assessed. This process would result not being very costly, but at the same time monitoring the signal itself appears to be not quite valuable either.

The sensors are a technology that is already on the market and not seeing any special improvements at the moment, for they are very simple and easy to use. It would be about relying on a system for the collection and reporting of inspections in a better way, currently it is on paper or pdf. The value will lie in the opportunity to see the number of comments on different urgency levels that the inspectors have made. However, he believes that not all the Insurance companies would be willing to share their data, and nothing can be done about it as they are their customers.

When it comes to fire inspections precisely, he also states that it is still important that they are conducted physically, given that the sensors would not be able to replicate all the work that a human can do.

The National Fire Protection Association

The National Fire Protection Association (NFPA) is a non-profit organization operating in the United States on a global scale. It was established in 1986 with the mission to reduce and mitigate deaths and injuries of people, as well as physical and economic damages and losses of both public and private properties, caused by fire, electricity and related risks. Like the Swedish Fire Protection Association, with which it is partner, the NFPA provides the society with information and knowledge by determining and setting codes, standards, rules and regulations, by offering training sessions and engaging in projects of research (NFPA.org)

Respondent 3 has been contacted via Skype, who is Director, Research and Data Analyst at NFPA, with the purpose to learn more about the process of data analysis within the organization, as well as to be informed on how the National Fire Protection Association handles fire inspections, in the specific.

He said that at NFPA they dispose of a few databases but there is not a centralized place for the information collected: there exists a digital record for it, but everything is done manually, i.e. the tests of the inspections are still carried out in a very traditional way.
NFPA is currently working on a *pilot project* that pretty much resembles the intent of the Swedish Fire Protection Association: to see whether it is possible to digitize the information that comes from the different types of tests, so that both such information flows better and also it would be practical, if they could capture data from fire pumps, to do an analysis on that data with the objective to better develop codes and standards about when the inspections should happen; this way, they would help people have a more predictive sense of when a fire pump could fail.
At the moment, inspectors just limit themselves to look at the fire pumps and say: “this year we have to test this, this year we have to test that”.

At NFPA, similarly, they need a way to get updates on the status of the inspections. The major problem they are encountering is to gather data in a centralized place. A lot of people have this data written on paper in the basements of the buildings or the local fire authority has it: there is no central location for such important information.

Every individual business owner, Respondent 3 claims, would want to be part of a system where they could put data into a database that records and analyzes it, but such platform does not exist and they are figuring out what the economically viable way to implement it is.

Insurance companies in the United States do not have access to that type of data, but they would like to. They are indeed working together on this project to see if it is feasible to increase such access, but at the moment no improvement has been made. The question is, how can they start a new program of collection and analysis of data employing technology, and how the information gathered can flow back into the already existing systems?
The aim would be to leverage on the already established infrastructures (like big data platforms) and verify if they can support the data collection from the new technologies: effective would be to create a sort of *research testbed* that would be able to do the analysis.

Supporting this process does not appear to be costly (almost 20,000$ per year), but the major cost would be conversely related to hiring data scientists that could go through data and deliver value. The biggest cost would in fact be the people.

Furthermore, NFPA is currently working on this project that is built up on a previous one done in 2012 which was a first attempt in the United States at trying to collect data from fire pumps, but that did not succeed at that time. The two public projects at hand will be better examined in the chapter relative to Secondary Data.

Verisure

Verisure is a Fire Alarm company established in Sweden in 1988. It has become Europe's leading supplier of monitored safety solutions and fire alarms, operating today in 14 different countries. The company provides also home alarms, for a better and secure protection at home, and digital installations for public buildings and businesses (Verisure.com).

Respondent 4, Product Specialist at Verisure, gave the author interesting insights on the functioning and benefits of the fire alarm systems, given that the study focuses on the fire inspections precisely.
The core business at Verisure are the *intrusion alarms,* and the fire alarms are included in the *intrusion system.* The fire alarms in the specific, are a warning system that notifies when a smoke is detected in a house or a business facility; on the contrary, *sprinklers* react on the heat. Those buildings or residential houses that rely on a *sprinkler* system sometimes experience a lot of damages due to all the water provided by such components.

Verisure, in Sweden, depends on the so-called *optical smoke detectors* that have the advantage of furnishing accurate detections and therefore of minimizing the amount of false alarms. At the company, they make statistics on the number of fire incidents they report locally every year, and they store this information into a database. If a fire incident has happened, they do a report on each one of them to investigate the cause and other factors.

Another effective tool they rely on is the visual verification of the presence of fire done with the employment of cameras. The cameras are structured in such a way that they take pictures repeatedly, as long as the fire detection process is in function, and it is hence possible to verify if there is a smoke. The *visual verification* of the presence of fire is extremely helpful and it is an activity that has to be improved. The main concern is to get the image, so that they can monitor the fire instantaneously and this way shorten the process from detecting the smoke to having someone that goes immediately to the place in question. If they had a system with no cameras, they would not know if it is a false alarm; moreover, cameras do the job of verification without having the need to send physically somebody to the specific spot in the first place.

Independent IT Consultant

Respondent 5 is an independent IT Consultant that is currently collaborating with the Research Manager at The Swedish Fire Protection Association on the realization of the Sandbox model. He has been interviewed to get additional knowledge of the Sandbox project that the organization is aiming at implementing and specifically to learn about the technical connotations of it.

Respondent 5 is mainly in charge of getting sample data to show the idea to the parts involved and get feedback on the effectiveness of the project. He is experimenting with combining and assembling the different actors, i.e. the Government, the Swedish Fire Protection Association and the Insurance companies.

The problem for the latter, he says, is to figure out how to rely on each other and trust each other when it comes to exchanging data. For example, if a fire in a multifamily home takes place (like multiple apartments) and one or more Insurance companies are involved, it may arise the issue of having to investigate into the data from each and every one of them, and of course to get the full picture of the incident it is necessary to get all the data somehow connected and displayed together; the Sandbox model, in this respect, would help provide information for example on the total cost of the fire (i.e. the costs of damages), how it spread and so forth, to either predict or prevent the next similar incidents from happening.

The tools to analyze data are becoming more and more available to the market and to the general public, therefore it would not be much costly to implement a platform like the Sandbox, but at the same time bringing together the different data sources appears to be the major, crucial problem. When the model is built and the data is collected, stored and tied together, certainly making the reports or extracting the data would result quite easy, but the model itself is somewhat complex and elaborate to run. For instance, challenging would be to identify the nature of all the incidents given that there is not an actual measure or a national ID for them; there exists the *express alarm* when someone calls the 112, but not all the fires or incidents are reported to 112 (e.g. when a person is able to extinguish the fire themselves): they are conversely reported to the Insurance companies, and it could be difficult to map the same incident through the different Insurance companies.

Respondent 5 is dealing with the technical side of the project, consisting in managing the database and discovering how to link the different data sources and the reverse geocoding of the addresses. The major issue is obviously that Insurance companies are quite reluctant to share their data, for they are afraid that it might be somehow ending up in their competitors' hands, giving them access to sensitive information such as how they price their services, to what extent they reimburse the costs for the damages and so forth.
The dispute is essentially about to what degree Insurance companies can trust the Swedish Fire Protection Association with respect to sharing confidential information with the other Insurance companies if such data is illustrated into the same database.

Folksam

Folksam is a Swedish Insurance company based in Stockholm and operating in the market for over 100 years. It offers all kinds of insurance policies, from home insurances to car insurances, life insurances, children insurances, long-term savings and so forth.

Their job is to ensure that the customers are secured in all the phases of their lives and can save enough for when they will retire. The company's vision is that "*the costumers are our owners, and sustainability is a good deal*" (Folksam.se).

Bearing in mind that Insurance companies represent the major and most important customers of the organization, the investigator has reached out to Respondent 6, Development and Reports at Folksam, to primarly learn about their needs and understand what particular challenges the company is facing today and what others it may face in the future; also, the author was interested

in having their opinion concerning the implementation of a computer-based system for the storing of data and their thoughts about a potential digitalization of the fire inspections.

Unfortunately, Respondent 6 was not available for a phone/Skype interview, but she was very kind in answering some of the questions via email. However, this circumstance prevented the examiner from getting all the information that she needed in order to do the ultimate analysis. Moreover, she said that her division worked only for their customers' fire safety and thus she could not answer questions regarding Folksam as a company.

What she gave information on, instead, is that at Folksam they do not conduct regular fire inspections at their customers' today (except for new villa customers and some follow-ups for those who have their best villa insurance, which will be inspected every 5 years). Their challenge is to get their customers to prioritize fire protection and to check and look after fire protection themselves.

With respect to data analysis, Respondent 6 said that it is an important part of their work to develop knowledge, in their case, about how damage occurs and what it can be done to prevent it.

Länsförsäkringar

Like the previous one, Länsförsäkringar is a Stockholm-based Insurance company established in 1844 and providing today all kinds of Insurance solutions to both private and business-owner customers, supporting and helping them receive the best security in their everyday life (Länsförsäkringar.se). Same as for Folksam, Länsförsäkringar is an important client of the Swedish Fire Protection Association for which the organization is willing to generate more value, by providing them with more information and by involving them in the process of data sharing.

The researcher did not conduct the interview herself but she has shared the content of the discussion with a colleague of hers working on the Sandbox model. The interviewee, Respondent 7, is the Chief Innovation Manager at Länsförsäkringar, in charge of serving with several small and big companies from different fields, looking after their value proposition in the future.

Respondent 7 explained that, in relation to the challenges confronted today, the most critical one is that the firm is essentially not selling insurances anymore. The step to be taken should

be to move all their resources and money from being reactive to being proactive, in order to discover how they can guarantee safety to their customers in the future.

One of the company's major concerns is to figure out how they can process data exploiting the new technologies to help minimize the risks related to different kinds of damages.
The interviewee claimed that before starting working at Länsförsäkringar he believed that Insurance companies were much more mature than they actually are in the way they employ data. It is hence necessary to develop new predictive models that would eventually lower or even eliminate the risks. In this regard, many pilot projects have been initiated, and the interviewee states that it is crucial for him to show his company what they can do with that new kind of data.

With respect to the benefits and challenges of using and sharing data, he claims that they cannot deliver any personal services if they are not able to use data. "*If we cannot see our customers' data nor other organizations' data, we cannot make accurate predictions*", said Respondent 7 (and mentioned the *blockchain* as a potential technology), adding that "*We do not use data to punish other people involved, we use data to help us reduce risks; also, if we can lower the costs by using data within the group, we can help people take actions*".

Specifically concerning the Sandbox model, he declares that it would be good to collaborate with different kinds of actors in the field and see how they can all combine data and benefit from the sharing of it. It is complex, in reality, to process data that way, but with a platform like the Sandbox it would become much easier. Unfortunately, the rules about how people can use data today are very strict (GDPR legislation, explained above).

The main incentives for the organization to share their data and be part of a project like this consist in the opportunity to help their clients prevent fires, and this would be "*fantastic*". Being just reactive when an incident happens and paying out money when it is already too late is not what he wishes for the company in the future. They, on the contrary, have to work out a way to see how they can prevent incidents from happening.
Of course, there are some things that affect the decision of the company to engage in the project, like for instance the time, the resources and the effort required; also, they first have to figure out what kind of data they have at disposal and what is an effective way to use it.

Referring to the potential actors involved, Respondent 7 said that it would be great if there were a mixture of organizations (like private safety firms, governmental agencies and insurance companies) but it is always a challenge when there are different stakeholders in the same

business ecosystem. Who is helping whom and who is the winner? Trust is very important: if they are taking data from the organization itself to facilitate their work and protect the customers, they definitely need to know how they can use that data.

At the organization they are currently collecting some data related to fire safety. They are collaborating with a startup that develops IoT platforms and storing data from moisture sensors that send out information in real time and control temperature.
"*If together we can help each other and eliminate risks for different kinds of damages, everyone will be happy*".

Sector Alarm

Sector Alarm is the second largest player in the Sweden's Alarm market, established in 1995. It provides their customers, both private housing and small businesses, with the best safety and security solutions, aiming at becoming the leading alarm company provider in all Europe (Sector Alarm.se)

Like in the previous case, the insights of the interview have been with another colleague of the researcher working on the Sandbox model. The interviewee, Respondent 8, is the Business Development Director at Sector Alarm and gave the author's colleague interesting opinions and insights about the potential involvement of the firm in the project and the status of the industry.

He said, for instance, that rarely big companies like Sector Alarm would be willing to share their data with other enterprises, regardless of the purpose, for they have too much of a bigger advantage with respect to other businesses in the industry.
Moreover, he also added that the number of fire incidents in Sweden is relatively low, and the smoke detectors activating are most of the times false alarms (these are considered numbers too irrelevant to be taken into consideration for this matter), therefore if they had to exchange information with their competitors they would do it for a higher certainty that a fire occurs.

4.3.3 Workshop at The Swedish Fire Protection Association

On the occasion of a mid-term presentation delivered by the students at the end of April 2018 at the organization headquarter in Stockholm, all the attendees (the students working on the different projects, the Project Manager and the CEO from First To Know, the Research Manager and the General Secretary from the Swedish Fire Protection Association and many other managers, consultants and engineers from different divisions at the organization) joined a two-

hour workshop in order to exchange opinions and brainstorm on several pertaining and complying topics.

In groups of five, and in a limited amount of time, they had to propose ideas answering a given question, that was: “How can the digitalization and technology of today be effective in the world of Fire Safety?” and therefore “Which of the ideas conceived are feasible to apply within the Swedish Fire Protection Association?”
This way, all the participants had to write down valuable ideas and share them with the other components of their groups. The result was that, not only did all the individuals come up with genuinely and unquestionably good ideas related to the subject, but also it was a remarkable and worthwhile session that contributed to providing the author with further relevant information and additional knowledge of the research that she was conducting.

Constructive ideas that were given birth were, for example, the utility of digitalization in the Fire Safety area in terms of Machine Learning and potential employment of robots that could eventually replace humans in dangerous and hazardous circumstances, or the implementation of a database that would get different organizations cooperate to enhance fire security for the public, or the installation of sensors and similar remote devices to identify the risk in private homes inhabited by elderly people, and so forth.

Furthermore, at the conclusion of the mid-term presentation given to all the people attending, the author has received constructive feedbacks and educational critics that helped her better direct the enquiry, as well as significant suggestions on how to proceed with the research and what else to potentially include.

4.4 Secondary Sources of Data

The secondary sources of data are the information and facts examined and gathered from the web, as well as reports, journals and articles mainly relative to public projects undertaken by the organization’s overseas partner NFPA. In this respect, interesting insights are provided in a short report on the Application of the Reliability-based Decision-making to the ITM Frequency, from the Fire Protection Research Foundation (2013). The ITM are the recurrent inspections, testing and maintenance required by NFPA standards for fire protection systems. Usually, such requirements are not based on actual and real ITM data or anomalies encountered, hence it is important that these standards for fire protection look more to the ITM frequencies.

Additionally, when it comes to water-based systems (like the *sprinklers*) the resources needed for the testing are increasing at a fast pace; for this reason, NFPA has received properly four requests to initiate a project on a risk/reliability-based approach responding to ITM frequencies. Even though these requests refer to standards of different fire protection systems with their own ITM issues and objectives, the foundations of an approach based on reliability for setting desired ITM frequencies are the same.

Another valuable article is taken from the Journal of NFPA (2018) on a research done by the Fire Protection Research Foundation about exploiting predictive analytics to improve ITM processes: data-driven approach for the future of safety operations. The 2018 project is carried on in the wake of a previous project started in 2012 on how to capture data from fire pumps and use them in a reliable and effective way.

The author of the publication recognizes the effectiveness of the data revolution as something that will enhance the way by which NFPA as well as other safety provider companies make decisions, foster reliability and maximize efficiency and performances.

A powerful example is the project of research which the Fire Protection Research Foundation is currently working on, about trying to implement data analytics to get information on the status of fire pumps, for better and higher inspections, testing and maintenance, as well as for an improved functioning of *sprinklers* and other protection devices. However, currently there is no scientific justification and explanation of why those ITM frequencies are what they are in the standards.

Here the Fire Protection Research Foundation is willing to operate with its project: collecting data from fire pumps, through inspectors' reports, insurances etc. is a first important step but it is not enough; what the project aims at, instead, is making that data valuable and worthwhile. This is the *raison d' être* of the data analytics: by comparing and examining historical data, the algorithms can make accurate and better projections about future results. An example can be to provide a percentage of failure of each fire pump.

Chapter 5

ANALYSIS

The following chapter will consist of a comprehensive analysis and evaluation of what has emerged from the empirical investigation, with the purpose to compare and assess all the experimental findings and eventually identify and categorize the similarities as well as potential discrepancies among them. The ultimate objective of such labor of examination, as announced at the very beginning of the dissertation, is to develop a *Sustainable* Value Proposition for the Swedish Fire Protection Association that comprises the implementation of technology and automation within the area of Fire Inspection.

More precisely, the empirical research has been aimed at discovering and understanding the challenges, needs, wishes and opinions of customers, partners and other stakeholders in the ecosystem, with a special focus on the Insurance companies, that represent the organization's major clients and the segment which the company aims at delivering value to.

In this respect, bearing in mind that a greater satisfaction of the customers and the will to produce more value are the underlying reasons why the organization intends to innovate its entire business model, the new *Sustainable* Value Proposition will be built and structured by filling up the Customer's Profile and the Value Map of the Value Proposition Canvas by A. Osterwalder: the analysis will be therefore carried out by applying and implementing the theoretical pattern described in the chapter of the literature. An extensive and conclusive illustration of the whole model will be thus provided in the final paragraph.

5.1 Customer's Profile

The Value Proposition Canvas, as already defined in Chapter 2, explains the way throughout which an organization generates and provides value to its target clients. Such segment of stakeholders, which the company aims at delivering value to, is identified and expressed in the Customer's Profile, representing the right side of the template.

The Customer's Profile is in turn composed of the Customer's Jobs, Pains and Gains.

Representatives from two Insurance companies, Länsförsäkringar and Folksam, both based in Stockholm, together with other typologies of stakeholders have been questioned in order to

obtain worthwhile information and insights to fill in the VP Canvas, but unfortunately it is a small sample of customers that did not allow the researcher to gather enough and sufficient data. However, the results of the interviews show similarities and parallels in the responses, when it comes to what they perceive as the main challenges, necessities and wishes to fulfil on behalf of their firms.

5.1.1 Customer's Jobs

This particular section depicts a list of all the things that the Customer wants to accomplish in life and try to get done. It is to some extent the offering that they wish to supply to their clients. Keeping in mind that the most important customers of The Swedish Fire Protection Association are the Insurance companies, the operations, needs and challenges of this class of stakeholders have been investigated and analyzed trough the medium of semi-structured interviews, and hereby combined, compared and illustrated.

Commonalities with respect to the jobs and mission of the customers interviewed concern, for instance, *bearing the risk for uncertain damage-related costs* that is the core business of the Insurance companies by nature; consequently, if a fire incident occurs with subsequent damages-related costs, the Insurance company will *pay out money* depending on the premium that the Insured has purchased.
Another significant task to achieve in the long run is with no doubt *building long-term relationships with the Insured,* making them aware of the fire hazards and *getting them prioritize fire protection themselves,* as outlined by the representative from Folksam.

Among the other activities that the Insurance companies undertake, there is certainly *the risk mitigation and minimization*, and the *provision, intensification and improvement of security and safety solutions for households and business owners*: by this, we not only mean fire-related resolutions, but also life insurance policies and security against theft, car incidents and so forth.

Least, but not last, what the Insurance companies wish to *increase* in the next future is the *access to customers' data, in order to make more accurate predictions and properly prevent damages (e.g. fire incidents, burglaries etc.).* The whole set of activities and other not here mentioned are enclosed and described in the comprehensive practice of *selling insurances to individuals and businesses.*

5.1.2 Pains

The Pains are the negative outcomes and connotations arising for the customers while getting the job done. Analyzing and confronting the results obtained from the interviews, it emerges that, most importantly, the Insurance companies suffer from a huge loss when *the severity of the damage is greater than the extent to which the risk has been assured,* that is when *the detriment-related expenses are higher than the premium paid by the insured*.

Likewise remarkable are *the effects and disruptive consequences of technology*: the major need is to *understand how to use data effectively to help people reduce risks of incidents*, as the representative from Länsförsäkringar claims. In the current state, it is indeed *complex and problematic to make good and accurate predictions if* they can count on a *limited access to customers' data.* Therefore, the Insurance companies *cannot deliver personal services if they do not have sufficient availability of the insured data.*
Negatively affecting such desire of innovation is the *limited amount of time and resources, as well as a lot of financial and human effort required.*

Another significant discomfort when it comes to the potential implementation of a computer-based system for the data storage and sharing, as outlined by both the respondent from Länsförsäkringar and the Independent IT Consultant, is the *reluctance of Insurance companies and organizations from other industries to share confidential information with their competitors*, such as how they price the services supplied, to what extent they refund the damage-related costs and so forth.
An essential reason that influences such unwillingness is unquestionably the *General Data Protection Regulation* (*GDPR*) and other complex legislations in such area that allow companies to share their personal data to a limited scope and degree only.

5.1.3 Gains

The Gains represent how the Customers evaluate their achievements and accomplishments deriving from good performances, such as positive financial results, rewards and aspirations. What the Insurance companies perceive as their most important and satisfactory gains is, for instance, the profits stemming from the operating activities, and in particular *when the costs resulting from the damages are lower than the premium paid by the insured.*

Noteworthy are the recompenses acknowledged when *good predictions and reliable prevention lead to inferior risks of incidents*, that, specifically the fire-related ones, luckily turn out to be

quite in a small number in Sweden, as the executive from Sector Alarm declares. A *broader number of people recognize the importance of (fire) protection, safety and security, by purchasing more insurance policies.*
This, sequentially, results in an *enlarged reputation- and trust-based relationship* between the Insurance company and the insured.

Furthermore, encouraging outcomes arise when the Insurance firms *succeed at capturing and exploiting customer's data in a smart way*: the challenge stands in the ability from managers and executives to not only gather and collect as much data as possible, but also to be capable to employ that huge amount of data effectively and in a clever way.

5.2 The Value Map

The Value Map, contrarywise, displays the process of generation of value analyzed from the organization's point of view, more than the Customer's. It is a presentation of the (new) products and services that the enterprise wishes to create value from: the offering that the firm is willing to deliver to its customers and the way throughout which it intends to operate.
The Value Map is likewise made of three sections: Products and Services, Pain Relievers and Gain Creators.

While in the Customer's Profile we have been examining, evaluating and comparing the insights collected from the semi-structured interviews, studying who the Customer is, what they do, want and aspire to, what benefits they are getting from their activities and what challenges they are handling today, in this particular section we will explore what the organization object of the study aims at offering to its clients, in which way such offering can be a pain reliever, in the sense that it can lower, diminish or even eliminate the Customer's pains, simplifying and smoothing their lives, and thus be a gain creator, meaning that it can maximize and amplify the benefits and the affirmative results that the Customer wants to achieve and realize.

The three subsequent sections will be filled up by merging and assessing the information that the author has accumulated during the first preliminary visit at the organization headquarter in Stockholm and the following workshop, and at the focus groups at First To Know Scandinavia AB in Gothenburg.

5.2.1 Products and Services

Several times in this paper the new offering that The Swedish Fire Protection Association is aiming at providing has been described and presented. The organization, indeed, is craving to innovate and transform its entire business model supporting the area of business relative to the *sprinkler systems*, introducing a new technology and a new way to run and conduct the fire inspections, that is the technology of *sensors*.
Such technology is already on the market and easy to operate, as the PhD Student at the Department of Fire Safety Engineering from the University of Lund explained.

The *sensors*, as well as other effective remote installations, would function in such a way that they would be able to anticipate and predict a potential fire in a home or a business facility, by detecting the blaze and capturing the signal of warning, and digitally transferring it to the *sprinklers* promptly: at this point, the sprinklers would thus go off with a more assurance and reliability, preventing them from activating in cases when it is not necessary.

The *sprinklers* could in fact produce way more damages than we think as they would fill up a room with water, destroying materials irreversibly and sometimes going off by mistake (e.g. bugs or false alarms). Moreover, the *sprinklers* require periodic inspections and maintenance as well as considerable storage of water, and this could end up being quite enough expensive if we also add up the human workforce that currently is employed (considering that today fire inspections are processed manually and physically). The sensor-based inspections would then eventually be a cost-effective solution that ensures and helps the *sprinklers* operate in a more efficient way.

The willingness to switch to digital and automated fire inspections stems from a specific need of the Insurance companies, that today obtain insufficient information relative to fire inspections conducted at the insured's and cannot make proper and accurate predictions of fire hazards. If the Insurance companies are not allowed to access further personal data of the insured and therefore precisely prevent incidents, they are inexorably running the risk that the such hazards could result being greater and more severe than expected, forcing them to shell out money above and beyond.

The *sensors*, in these circumstances, would then be exploited to *collect and report better-quality data* relative to fire inspections *and to a greater extent*, in order to allow the Insurance companies to easily increase their risk forecasts and evaluations. They would thus be capable to store worthwhile information and data with respect to the inspections ran at the insured's

facilities, making sure that the organization's customers can employ a *predictive model to mitigate or eliminate risks of incidents.*

The aforementioned information relative to fire inspections at the insured's, caught by the *sensors*, would then eventually be transferred into a database (a computer-based system), where it would be stored and preserved. The Insurance companies at this point can have access to way more relevant data that will help them conduct operations more effectively.
Such platform, which at the present time is object of study and testing under a larger and eminent project that is the *Sandbox model* will hence be a source of data sharing, where Insurance companies, as well as other types of organizations in the ecosystem, by sharing their data will be provided with significant and essential information that currently they do not have, but need.

By looking back at the Conceptual Framework of the Theoretical Background, it goes without saying that it is also important to include and embrace those activities displayed in the Value Proposition compiled by the author, that also in this case are to be considered and addressed: *generate and deliver value to all the stakeholders in the network chain, enhance the quality of life and improve the safety and health of people, establish and provide Standards & Guidelines, educating people about the importance of fire safety,* and *ensuring security and protection for a more reliable Sweden.*

5.2.2 Pain Relievers

How can the transition to (partially) automated and digitized fire inspections (given that part of the job would still be conducted manually) solve or mitigate Customers' pains and troubles? First of all, they would see a notable *reduction of the expenditures related to the risk evaluation* of the fire incidents, in the specific case in question, as well as a *decrease of the costs linked to physical inspections* (we recall that, for example, electrical inspections cost 10m kr per year);

They would get the chance to rely on a *centralized place for the collection and storage of fundamental and key information,* that would enable them to count on a higher cooperation among diverse corporations, to access useful data in order to enhance predictions and projections, to improve risk detection and assessment, and consequently, to ensure clients' safety.

More in general, the implementation of a technology that remotely captures the signal detected by the sensors and immediately raises the alarm, *guarantees a superior certainty that the*

sprinkler systems work in case of fire incidents, and therefore additional security to the society as a whole.

5.2.3 Gain Creators

The new service that The Swedish Fire Protection Association wants to supply, still under evaluation and testing, will undeniably result in an augmented *satisfaction and happiness of the Insurance companies*, given that until this moment they have not been very pleased about how the organization has managed the fire inspections.
More information provided is equal to more value added, for the organization, its customers, the key partners and the total public. This, sequentially, will let the Swedish Fire Protection Association experience a *further and enhanced involvement in the society* as a whole, thanks also to its relationship with Governmental institutions, which they furnish fire inspections to.

Moreover, the Customers will thus have an *advanced knowledge of the risks*, avoiding the peril to sustain expenditures that are greater than the damage verified, and this would give them the chance to move *from being reactive to being more proactive*, like the representative from Länsförsäkringar addressed.

Finally, the application of a digital and reliable platform for the data sharing, where the partners can work in together would *enrich security provision* to the insured of all kinds: in this respect, the manager from Länsförsäkringar exemplified with the concept of Blockchain as a potential technology.
The overall new offering from the organization will eventually lead to greater money transformation, and given that it is a non-profit corporation, the resources obtained could be invested in research, campaigns and so on and so forth.

5.3 Sustainable Value Proposition for the Swedish Fire Protection Association

The empirical findings collected throughout semi-structured interviews, initial meetings with executives, focus groups and workshops, and further insights and information that the author has gotten in touch with by examining and looking at public projects undertaken by the organization's most important overseas partner, the North American Fire Protection

Association, have allowed the researcher to thoroughly develop an appropriate and *Sustainable* Value Proposition for the Swedish Fire Protection, that can *sustain* and last in the long run.

The *Sustainable Value* Proposition suggested has been conceived by employing and filling up the Value Proposition Canvas (or Design) framework derived from the literature, and therefore by selecting, among the most useful and interesting key findings, those that could represent to the fullest the Customer's Jobs, Pains and Gains, and the organization's Products and Services, and the segments describing how they can possibly be identified as Pain Relievers and Gain Creators.

A visual representation of the all-inclusive diagram, stuffed with a combined and selected collection of key findings, conveniently summarized, is provided below.

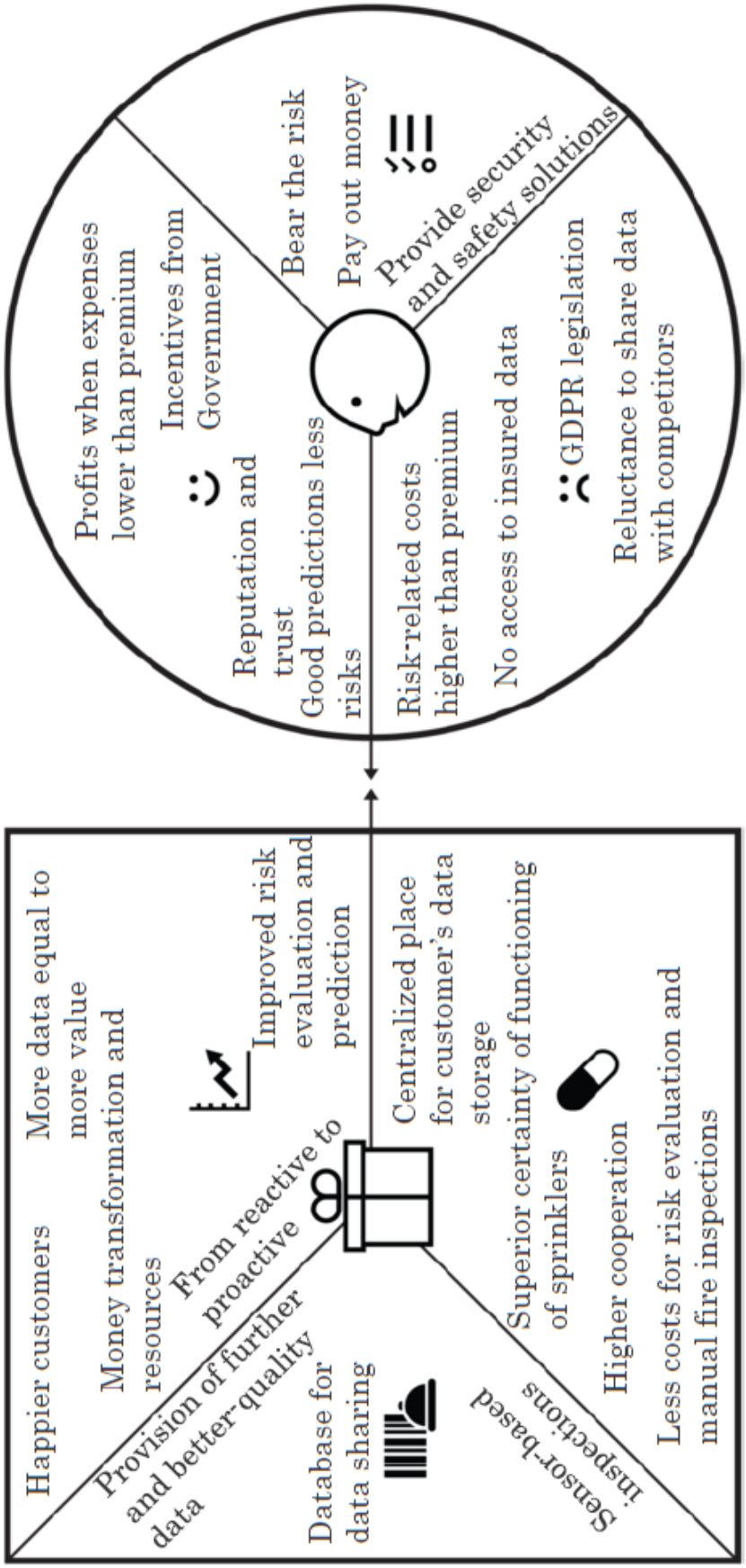

Figure 5.1 *Sustainable* Value Proposition according to empirical findings. Source: compiled by the author.

Chapter 6

CONCLUSIONS

The final and closing chapter of the investigation performed will be designed to furnish a summary of what has been covered in the previous five sections of the dissertation, as well as it will provide a clear answer to the Research Question outlined in the Introduction.

The conclusive chapter will then delineate and specify the Limitations of the Research, i.e. the aspects and features of the project that have not been included nor considered in the research, and consequently it will offer personal recommendations and suggestions in the last paragraph, together with likely hints for a Future Research that the Swedish Fire Protection Association could possibly pursue.

6.1 Conclusions

The project assigned to the researcher from *First To Know Scandinavia AB* has been intended, as many times mentioned in the manuscript, to develop a *Sustainable* Value Proposition for an important client of the company, that is the Swedish Fire Protection Association.
In order to do so, the author has undertaken a continuous process of research and investigation of the theoretical background, that best supports and assists the study, and a thorough collection of empirical findings to get helpful and beneficial insights to accomplish the task in question.

The Research Question stated in Chapter 1.3 of the Introduction and here addressed, is the following:

"*What can be an appropriate and Sustainable Value Proposition for The Swedish Fire Protection Association that can support the automation of the fire inspection?"*

To answer the Research Question the author has gone through different steps. The first one consisted in determining and setting up the Theoretical Framework, that is all the existing academic and non-academic articles, definitions, concepts, theory and models that best refer, according to the researcher, to the specific case study analyzed.

In this respect, the notions that have been reviewed and considered as suitable for the study relate to the general description of Business Model and Business Model Innovation; the concept of *sustainability* and how it can be applied to modern Business Models; what we do mean by Value Creation and Value Capture; a broad depiction of the Business Model Canvas and of its nine building blocks, with a particular emphasis on the segment that is the Value Proposition and the Value Proposition Canvas template; an explanation of the concept of Portfolio of Business Models, considering that an expressed need of the organization has been discussed in the Empirical Findings, although not considered for the purpose to answer the Research Question but only on a theoretical perspective; the relationship between Business Model Innovation and the impact of Digitalization, and finally, a Conceptual Framework compiled by the author to demonstrate how a potential Value Proposition of a non-profit organization responsible for Fire Protection might look like according to theory.

Afterwards, a chapter on the Methodology has also been presented with the aim to enlighten the reader with the methods and approaches exploited while performing the research.
In this respect, the author has given details on the Research Strategy, specifying that it has been a *qualitative* research, and on the Research Design, pointing out that investigation has been in the form of a *single case study;* moreover, explanations were also offered with respect to the Research Methods for the collection and gathering of data, making a further distinction between primary data (i.e. semi-structured interviews) and secondary data (i.e. public projects from NFPA). Lastly, the author has assessed the Research Quality of the study by referring to the criteria of *validity* and *reliability*.

Subsequently, all the experimental data gathered during the investigation have been sorted out in the Empirical Findings, where the author has provided insights on the current operating situation at the Swedish Fire Protection Association and their desire of innovation and transformation; then, a classification of the Primary & Secondary Sources of Data has also been given: the former consists in preliminary meetings at the organization headquarter, focus groups at FTK, semi-structured interviews and a workshop attended; the latter in the exposition of two public projects undertaken by the North American Fire Protection Association about how to collect data from fire pumps, that indeed resemble the organization's objective to gather data from the *sprinkler systems.*

Lastly, in the chapter of the Analysis, the researcher has reviewed, assessed, compared and combined all the empirical findings and information obtained from the interviews, with the purpose to re-arrange them into the different segments of the Value Proposition Design and

develop a new *Sustainable* Value Proposition for the Swedish Fire Protection Association by applying the theoretical model conceived by A. Osterwalder (2014). The components of such framework that have thus been filled in are: the *Customer's Jobs, Pains* and *Gains*, and the *Products* and *Services* of the organization, as well as how they can be perceived as *Pain Relievers* and *Gain Creators.*
A conclusive and comprehensive graphical depiction of the model, compiled by the author, has therefore been offered at the end of the chapter.

At this stage, it is appropriate to assert that the Research Question aforementioned has been addressed and answered by exploiting the Value Proposition Canvas, and thus by completing the template with the experimental data and intel attained throughout the carried-out research. More precisely, "*an appropriate and sustainable*" Value Proposition is the one that, according to P. Laja (2018):

- Clearly expresses and describes the offering of the company;
- Identifies in which way such offering can maximize the benefits of the customers (the Insurance companies);
- Pinpoints the segment of customers which the organization is willing to generate value for;
- Explains why the offering is unique.

As for the last statement, the new offering of the organization appears to be unique given that the Swedish Fire Protection Association has the monopoly in the sector and it is the only corporation responsible for Fire Inspections and Fire Safety and Security in Sweden, therefore no other corporation can propose similar products and services with respect to this specific field.

6.2 Limitations of the Research

The biggest limitation of the study here conducted undeniably concerns the two criteria used to evaluate the Research Quality, i.e. the internal and external *validity*, and internal and external *reliability*.
As clarified in the Methodology, the two criteria are more suited for the quantitative research, given that they aim at assessing the consistency and reliability of the measures and indexes employed in the study.

Nonetheless, many scholars claim that they can still be applied to the qualitative research, whereas others are promoters of alternative criteria that appear to be more adequate for this particular type of investigation.

In this respect, given that the author has referred to the concepts of *validity* and *reliability* to evaluate the quality of the study, some of them unescapably end up being quite low, or even not encountered.
For instance, the *internal validity* that relates to the consistency of the results obtained with respect to the analysis carried out can be recognized as adequately high, while the *external validity* seems to be somehow limited, referring to the concept of *generalizability* (the outcomes of a Single Case Study design cannot be generalized, rather it is more appropriate to talk about *particularization*).

On the other hand, the *internal reliability* is linked to the objectivity of the facts observed and it is therefore almost absent, given that in a qualitative research the researcher is biased from his/her *subjective* and personal interpretation of the facts observed; the *external reliability* refers instead to the replicability of the study, which appears to be quite low , as well, provided that the author has conducted the study from a *subjective* and independent point of view (Bryman and Bell, 2011).

6.3 Recommendations and Future Research

The entire project has been focused, as requested from the organization, on the concept of *sustainability* as applied to Business Models and hence to the segment of the Value Proposition here addressed.
The Master's Thesis project here performed, however, did not account of a central and eminent component of *sustainability*, that is the cost of it.
In this respect, as a future research it is advisable to also consider and evaluate what the cost of *sustainability* could be, which means how costly would be to maintain and support the cost-effectiveness and affordability of a long-term oriented Value Proposition for the organization, both looking at the expenditures but also at the benefits of it.

Considering that the Value Proposition that has here been proposed describes the way throughout which the organization intends to deliver value to its customers and identifies the segment of such targeted clients which the company seeks to satisfy, it is recommended to

question a wider sample of customers, that are the Insurance companies, in order to understand diverse perspectives and examine different opinions, with respect to the implementation of a computer based system for the data gathering, specifically in the context of the Fire Inspection.

In conclusion, the model here presented is not intended to be universally applicable, but it is the result of a process of study and assessment of the Insurance companies based in Sweden, as well as the outcome of a need expressed by the Swedish Fire Protection Association solely.

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Appendix I

Profiles of the Companies interviewed

The National Fire Protection Association

The National Fire Protection Association (NFPA) is a non-profit organization operating in the United States on a global scale. It was established in 1986 with the mission to reduce and mitigate deaths and injuries of people, as well as physical and economic damages and losses of both public and private properties, caused by fire, electricity and related risks. Like the Swedish Fire Protection Association, with which it is partner, the NFPA provides the society with information and knowledge by determining and setting codes, standards, rules and regulations, by offering training sessions and engaging in projects of research (NFPA.org)

Verisure

Verisure is a Fire Alarm company established in Sweden in 1988. It has become Europe's leading supplier of monitored safety solutions and fire alarms, operating today in 14 different countries. The company provides also home alarms, for a better and secure protection at home, and digital installations for public buildings and businesses (Verisure.com).

Folksam

Folksam is a Swedish Insurance company based in Stockholm and operating in the market for over 100 years. It offers all kinds of insurance policies, from home insurances to car insurances, life insurances, children insurances, long-term savings and so forth.
Their job is to ensure that the customers are secured in all the phases of their lives and can save enough for when they will retire. The company's vision is that "*the costumers are our owners, and sustainability is a good deal*" (Folksam.se).

Länsförsäkringar

Länsförsäkringar is a Stockholm-based Insurance company established in 1844 and providing today all kinds of Insurance solutions to both private and business-owner customers, supporting and helping them receive the best security in their everyday life (Länsförsäkringar.se). Same as for Folksam, Länsförsäkringar is an important client of the Swedish Fire Protection Association

for which the organization is willing to generate more value, by providing them with more information and by involving them in the process of data sharing.

Sector Alarm

Sector Alarm is the second largest player in the Sweden's Alarm market, established in 1995. It provides their customers, both private housing and small businesses, with the best safety and security solutions, aiming at becoming the leading alarm company provider in all Europe (Sector Alarm.se)

Appendix II

Interview Guides

The following questions support the semi-structured interviews that have been conducted with diverse stakeholders. The questions are all different, given the distinct nature of the stakeholders and are semi-structured questions, that allowed the researcher to maintain a fixed standard while giving the interviewee the freedom to express their opinions and introduce concepts not mentioned in the pre-set interviews.

The University of Lund

1. What previous projects have you worked on for the Swedish Fire Protection Association in the past, specifically with respect to Fire Inspections?
2. The following is the theoretical model that I would like to apply, what do you think about it?
3. How costly would it be, in your opinion, to install sensors and a computer-based system, like a database, that could value the risk instantaneously and collect information?
4. From an engineering point of view, what could be the benefits to have a partly automated fire inspection (i.e. using sensors in support of *sprinklers*?)
5. Why do you think the Swedish Fire Protection Association has not done this before? Reasons.
6. What is the current status of technology? Is it an incremental or a radical innovation? Has this technology already been established for a long time or is this one of the very first applications on the market?
7. Will this technology be easily improved in the future?
8. Would it be better to have a physical database or a digital one, like a cloud?
9. What about those places where water cannot be the solution to extinguish a fire?

The North American Fire Protection Association (NFPA)

1. Hello, would you please introduce yourself? (e.g. role and position within the company)
2. How does NFPA run the Fire Inspection?
3. Is it everything conducted manually or automatically?

4. How do you collect data and information relative to the facilities inspected? What kind of database are you currently exploiting, if any?
5. How does the *data analysis process* happen within NFPA?
6. How costly is it to rely on a digital platform for the data sharing, in your opinion?
7. Are there any projects undertaken by NFPA similar to the one that the Swedish Fire Protection wants to implement?
8. At which stage of testing is your company currently at?

Verisure – Fire Alarm Company

1. What is the relationship between your company and the Swedish Fire Protection Association? i.e., in which way these two companies are working together?
2. When it comes to the fire alarm system, at what stage of the technology is Sweden? Is there an advanced technology that has not been exploited in Sweden yet?
3. I am aware of the fact that Insurance companies, for example, are not very happy about how the Swedish Fire Protection Association is running the Fire Inspections, as they are not getting any feedback from either *sprinklers* and fire alarms. This is the reason why they want to install sensors that would capture the signal and transfer it into a database. The more data is available, the more they add value. How would the fire alarm system could be increased in this sense?
4. Where do you collect data coming from fire alarms?
5. How can fire alarm systems provide more data?
6. How does the overall process of data collection from fire alarms work?
7. What is the difference between *fire sprinklers systems* and fire alarm systems?
8. What are the benefits of one over the other?

Independent IT Consultant working for the Swedish Fire Protection Association

1. Are you familiar with the project of a new Value Proposition for the digitalization of the fire inspection that the organization wants to pursue?
2. What do you do at the Swedish Fire Protection Association, what are you specifically in charge of?
3. Have you been working on other projects for the organization lately? In particular with respect to Fire Inspections?

4. How the sensors could work in order to increase the provision of data? How could they provide information, and what kind of information they would provide?
5. How this data would be analyzed? What would be the process?
6. What kind of database would be suggested? Something like a cloud database?
7. What do we mean by "digitalization of Fire Inspections"?
8. Why the organization has not done this before, in your opinion?
9. What could be the value related to this change?
10. At which stage of the testing process the Swedish Fire Protection Association is currently at? Did they do some tests to see if this new concept could work?
11. Would this service be costly? Would this mean to hire new people, like data scientists etc.?
12. What would be the value of such computer-based platform and how would it practically operate?

Folksam – Insurance Company

1. What are the main challenges that your organization is facing today and in the future?
2. What specifically of the area of Fire Inspections your company is not happy about? (i.e. what of the Fire Inspection process can be improved, according to your company?);
3. Are you familiar with the concept of Data Sharing and Data Analytics?
4. Are you familiar with the Sandbox model that the Swedish Fire Protection Association would like to implement?
5. Is your company willing to be part of a large platform, where all the organizations can share their data? What would be the incentives to be part of this project?
6. What are the needs, with respect to the process of Fire Inspection that your company is having nowadays?

The following questions have been asked to the representative of Länsförsäkringar not by the researcher but by a colleague of hers who conducted the interview.

1. Could you please start and introduce yourself shortly? (name, position within the company)

2. What are the main challenges that your organization is facing today and in the future? (In relation to big data, data sharing)
3. What capabilities do you think will be of importance?
4. What do you associate with the term *data sharing* and *data analytics*?
5. What benefits and challenges with respects to *data sharing* and *data analytics* do you consider as most important?
6. What is your general opinion regarding the Sandbox project? (consensus/rejection)
7. What would be the main incentives for your organization to be part of this project?
8. What would be your main expectations/concerns, when participating into this project?
9. With respects to the project and the *data sharing*: how important is reputation (knowledge about the other stakeholders) trust, and mutuality for your organization?
10. How do you collect data related to Fire Safety and where do you collect such data?