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**The Critical Factors in Encouraging Alarm and Security
Companies to Join a Collective Action in the Big Data Field:
a multiple-case study**

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ABSTRACT

Working together with your competitors or, more generally, with other relevant players is becoming one of the main pathways to follow in order to achieve great results and accomplish your goals. Indeed, cooperation and collaboration are spreading through new and various forms of partnerships and common projects (Hecht, 2013). However, this trend raises remarkable advantageous as well as challenges and obstacles to be faced when trying to pursue a successful collaboration.

Within this context, *the Swedish Fire Protection Agency (SBF)* is trying to develop the so-called *Sandbox Model*, described as a Big Data recipient shared by different companies and stakeholders, where each one contributes with its own data. Through the cross-analysis of the huge amount of data, companies would obtain significant gains and benefits. The social purpose of SBF, nonetheless, is to tackle a social issue, namely the reduction of damages carried by fires and people killed in those occurrences.

In order to initiate the Sandbox Model, companies from pre-defined industries shall be convinced to embrace the project. The aim of this work, subsequently, is to identify the factors which may work as incentives and their role in encouraging companies from the Alarm and Security Industry to join this project.

In so doing, a qualitative approach based on a multiple-case study allowed us to delve into this issue and let these factors arise, providing recommendations for a smooth implementation of the Sandbox Model. Summarizing the findings, trust-related factors as well as organizational and structural features of the common organization play a remarkable role. These factors lay the foundation from which to identify incentives and dictate actions to entice companies from the Alarm and Security industry to join the Sandbox Model, followingly attaining a successful collective action.

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1. INTRODUCTION

1.1 Background

Leaders, organizations, politicians are acknowledging that their role and efforts towards their goals are facing increasing difficulties in a world which is becoming ever-complex and articulated between a countless number of factors to take into account (Hecht, 2013). One of the possible solutions to this deep and multifaceted obstacle is to work towards the opening of the personal and organizational boundaries so to initiate a collaboration project with external partners and individuals and strive for the achievement of a shared goal. This trend, namely the creation of new collaboration projects in disparate fields and contexts, has been growing in importance over the last years (Hecht, 2013).

Traditional economic models tended to assume that people are mainly self-interested and ego-centered, thus leading to the attainment of merely personal objectives and not caring about sharing or pursuing social and common goals (Fehr and Schmidt, 1999). However, a raising number of evidences is showing that people are naturally more cooperative than expected and assumed in economic theories. Among some laboratories experiments, subjects succeeded in achieving almost full cooperation, oppositely to the self-interest model prediction (Isaac and Walker, 1988).

The main outcome of these phenomena and the relevance to this work is that organizations, guided by not utterly selfish individuals, are moving towards a more collaborative scenario and are abandoning the closed and individualistic approach while pursuing their economic or social objective.

Besides, the changing way of competing and the new economic and market scenarios are forcing companies to rely on new methods and tools to sustain a competitive advantage and be able to effectively perform in their arenas and achieve their goals (Phillips et al., 2000).

As a first result, competing organizations are embracing the idea to form collaborative partnerships with actual and potential competitors, dramatically changing the way to do business (Entwistle and Martin, 2005). Entwistle and Martin (2005), studying the transition from competition to collaboration occurred in England under the Labour Government, highlighted some of the potential benefits deriving from the choice to collaborate over fiercely compete; to name some, collaboration can foster the cultivation of

long-term trust relationships, favoring each other's goals and the sharing of relevant data and information (Entwistle and Martin, 2005); additionally, partnering offers the chance to unlock the distinctive and unique competencies and capabilities of each player involved, helping the attainment of otherwise hardly achievable resources. The trend of passing from competition to collaboration is having an impact on the strategies of organizations, and illustrious economist Porter (1985) offered an economic justification of alliances and collaborations, such as the possibility to obtain a stronger market position together than companies could alone.

Furthermore, cooperative relationships are becoming a mainstream tendency also between companies and organizations not directly involved in a competitive arena (Phillips et al., 2000). Collaboration, in this sense, can be defined as "a cooperative relationship among organizations that relies on neither market nor hierarchical mechanisms of control" (Phillips et al., 2000). These collaborations can take the form of joint ventures, strategic partnerships, alliances, or outsourcing, just to cite some among the many more options (Harrigan, 1985; Kanter, 1990; Winkleman, 1993). The pursuit of these ever-important inter-organizational collaborations has had the objective to provide remarkable strategic benefits, as the spread of risk among the various members, access to new know-hows and technological capabilities, the sharing of resources as well as the entrance of new markets (Amara, 1990; Powell and Brantley, 1993; Barley et al., 1993). Under a more economic perspective, the importance of this trend lies in the possibility given to firms to focus on their own distinctive capabilities and combine them with the ones of other firms (Hamel and Prahalad, 1989).

The need to cooperate and collaborate to reach a common and shared goal is becoming increasingly relevant and, consequently, organizations must adapt to this new and more complex scenario. The gains from the mentioned new forms of relationships are of remarkable relevance, but even so, obstacles and challenges to the effective implementation of those collaborative proposals have to be faced and surmounted (Phillips et al., 2000).

1.2 Problem description

The role of Big Data, regardless of the field they are applied to, is attaining more attention over time, due to new possibilities and sources where to gather Big Data and the following new and potential applications of them (Chen et al., 2012). Consequently, the role of this huge amount of data, structured

or unstructured and captured as an endless flow, has contributed to the creation of new infrastructure, new businesses, new monopolies, politics and new economies as well (The Economist, 2017).

Among the disparate applications and projects tied to this growing phenomenon, the Swedish Fire Protection Agency (SBF) is currently trying to implement a project called *Sandbox Model*. This initiative derives from new technologies such as Internet of Things, novel and more accurate sensors, and more importantly the ever-growing availability of Big Data. The main purpose of this model is to allow different and diverse companies, coming from different industries, to share their Big Data within a common *Big Data recipient*, namely the Sandbox. By doing so, the SBF aims at fulfilling a social purpose, that is, the avoidance of fires, prevention of them and the reduction of people and objects affected by fires. This would be attained through the cross-analysis and live-collection of different typologies of data coming from the various firms involved in the project, so to be one step ahead of the burst of a fire or to intervene in a timelier fashion.

On the other side, companies joining the sandbox would enjoy other benefits, such as:

- ❖ A broader view of the market and potential customers beyond their own data silos.
- ❖ Access to innovations and solutions, which should translate into new revenues and a competitive edge.
- ❖ Market share growth from new business opportunities that are identified within the Sandbox.
- ❖ Other benefits coming from the insightful analysis and access to the huge amount of data in the Sandbox.

The focus of the Sandbox Model, in this latter case, would be for the companies to profit from the remarkable amount of Big Data coming from the diverse stakeholders and its insightful analysis.

Furthermore, SBF is trying to engage companies from mainly three domains: Government agencies, Insurance companies and Alarm and Security companies.

To implement this initiative, however, it is needed the actual creation of the Sandbox structure and organization, as well as the participation of the various stakeholders in the first place.

Companies belonging to the Alarm and Security Industry have been labelled as ones of interest, and consequently it is needed to engage them and convince them to embrace the project. The actual engaging of these companies, nevertheless, will constitute the main problem to address within this work, leading us to the definition of the research objective.

1.3 Research objective

The Sandbox Model is an ambitious project with a noble social purpose, but its actual realization has to meet the challenge to convince and entice companies from the above-identified industries to be willing to participate, collaborate and share their Big Data.

One of the most prominent feature concerning the Sandbox Model is that it entails the formation of an inter-organizational relationship between more stakeholders, either ones competing between each other and not. Thus, the main trend showed in the beginning comes into play, where organizations need the support of other ones to perform in a more effective way and achieve a better competitive position and all the related benefits. Besides, these companies have to face the challenges while trying to form a new collaborative relationship with external organizations.

Followingly, the main purpose of this work is to find what are the main and most critical factors in encouraging companies belonging to the Alarm and Security sector to be willing to join this project and share their Big Data. Differently phrased, the goal of this thesis is to show which factors can work as incentives and their role in regard of the companies of interest and which ones, as a logical consequence, could turn out to be hindering the pursuit of the Sandbox Model.

In so doing, the Sandbox Model nicely fits within the notorious theory of *Collective Action*, subject of study of scholars such as Marcus Olson and the noble prize awarded Elinor Ostrom. This theory discusses the antecedents and likely outcomes of actions taken by two or more individual in the pursuit of the same collective good (Marwell and Oliver, 1993). This theoretical perspective will work as the backbone of this thesis, and other theories strictly related to that will contribute to this project's purpose.

From this theoretical analysis, two main areas were found to be of particular interest while studying the potential incentives to be given to the alarm and security companies, namely the role of trust in inter-organizational projects and the most relevant organizational and structural factors linked to a successful collective action. This strong theoretical basis will guide our research towards the understanding of how these factors affect the willingness of the studied companies to join the Sandbox Model and whether they play an incentivizing role or not, as well as helping us to identify other possible insights and features considered to be important within this context.

This, in turn, leads us to the definition of our main research question and the sub-ones.

1.4 Research question

With the goal in mind to find which factors can work as incentives to allow companies from the Alarm and Security industry to get onboard the Sandbox Model, and building on the main theoretical background identified as prominent in regard to this, we can state our main research question:

- ❖ *What are the most critical factors in encouraging the Alarm and Security companies to share their Big Data in the pursuit of a collective action?*

To better answer this main research question and provide a clearer and more insightful answer, two more sub-questions will be addressed:

- ❖ *What is the role of trust-related factors according to the Alarm and Security companies?*
- ❖ *What is the role of relevant organizational and structural factors of the common-pool resource institution, drawn from the literature review, in the eyes of the Alarm and Security companies?*

1.5 Limitations

Due to time constraints, it was not possible to reach a particularly high number of interviewees during the empirical data gathering, which can contribute to render the results less generalizable and accurate, in addition to the fact of this work being a qualitative research per se.

Besides and more importantly, the Sandbox model is still at a very early stage, which made it necessary a high level of abstraction during the empirical data collection and interviews, since there was no chance to anchor our data collection on palpable and actual features concerning this model. However, the main goal of this thesis is to capture the point of view of managers and experts in a certain field, and to understand their perspective on a pre-determined phenomenon, even though the Sandbox Model is not in place yet.

A related limitation due to the fact that the project has not started yet is that it was not possible to observe the outcomes and performance of some features that could have turned out to be remarkable to the purpose of this study.

Lastly, even if the Sandbox model is principally focused on the use of Big Data, this concept will not be studied under a technical perspective and will not be one of the main focuses of this thesis, since theories will be chiefly concerned about the attainment of a successful collective action, where Big Data are part of a context in itself.

1.6 Thesis disposition

This work will begin from the theoretical background, which will act as a solid foundation on which to build the empirical data gathering. Indeed, the theoretical backbone of this thesis will guide the qualitative research conducted on the companies and help the analysis of the following results. After the literature review, the methodology applied to this work will be discussed, focusing on a qualitative research through the use of semi-structured interviews. Afterwards, the main results of the empirical investigation will be outlined, before delving into the analysis of the results and the formulation of explanations and insights, which will lead us to the conclusion of the thesis in tandem with a set of recommendations to SBF for a better implementation of the Sandbox Model.

2. THEORETICAL FRAMEWORK

In this chapter the reader will be introduced to the main theoretical background upon which this work unfolds. First and foremost, the *collective action theory* will be presented, being it the backbone of the entire work, along with its most notorious features. Followingly, the reader will encounter the role played by *trust* among different actors when having to cooperate and collaborate for a common purpose, immersed in the context of a collective action. Lastly, the *common-pool resource dilemma* will come into play, as a remarkable sub-category of the broader collective action theory.

2.1 Collective action theory

The theory of *collective action* is the cornerstone on which to base this project. Indeed, all the theories that will be presented in this work will be strictly related to the main theoretical concept of collective action. Following the statement of Marwell and Oliver (1993), collective actions are those “actions taken by two or more people in pursuit of the same collective good”. As Ostrom further pointed out (2009), a collective action problem appears when an individual has to decide which step to take in a specific interdependent situation, and the decision usually boils down to deciding whether to participate and contribute to the pursuit of a common good or purpose. Ostrom subsequently highlights that, if each individual based his or her decision on a short-term benefit framework, the overall outcome would be negative for the whole community interested in the attainment of the common good or purpose.

Resorting to the *theory of games*, the Nash equilibrium for a single iteration of this game would be detrimental to the community as a whole, whilst the decision to cooperate would raise the outcome to a more socially acceptable level (Ostrom, 2009). Thus, a collective action issue arises in all the situations in which more than one individual would greatly benefit from the pursuit of a common good or goal, but this outcome is unlikely to be reached since there is no real incentive to the single player to contribute toward it (Ostrom, 2009). The ideal situation to solve this concern, then, would be to thrust and encourage cooperation among the different individuals to reach a goal that would make all of them better off. One of the basic reasons that depict this latter scenario as hard to attain is the fact that people are generally self-interested and to some degrees selfish, and altruistic behaviors are considered to be the exception

instead of the rule (Olson, 1995), especially in economic-related situations. It logically follows that, underscoring Olson's statement (1965), "rational, self-interested individuals will not act to achieve their common or group interests". This stands out as a paradox to some extents, as often is in economic theories; indeed, all the individuals would be better off if they contribute to the common cause, but in the end, it is not probable that those individuals would pursue that objective if not under certain conditions. However, as it will be discussed later, empirical studies have challenged the proposition of a completely rational and self-interested individual which would lead to a non-contribution outcome (Ostrom, 2000). In spite of this, a full and revised theory of the collective action's principles has not yet been published.

The collective action problem is strictly linked to the classic economical problem concerned with the provision of a public good, whose theories try to explain the mechanisms of how actors act when they are faced with the creation of a public good (Samuelson, 1954). The main issue at stake is linked to the nature of the public good in itself, which is non-excludable and non-rivalrous; the former implies that no one can be excluded from the use of a certain public good, while the latter entails that the consumption of a good by one individual does not eliminate the chance for a second individual of benefitting from the use of the same good (Samuelson, 1954). Therefore, the underlying challenge is to induce the right amount of collaboration between different individuals to contribute to the provision of the good, since the main features of the public good let another issue arises: the free-rider problem (Olson, 1965; Sweeney, 1973); a free-rider is an actor that can benefit from the use of a good without participating to the provision of the same, and has consequently a really low incentive to contribute (Olson, 1965; Sweeney, 1973). As a logical consequence, the public good is not realized or is realized in less than optimal quantities, unless some other external factors take part (Samuelson, 1954).

In regard to this work and the typology of project undertaken, the free-rider problem can be nicely reconceptualized in light of the fact that databases and information present characteristics that do not easily fit into the classic economic theory. Fulk et al. (1996) help devising the concept of *communality*, by which it is meant a particular class of public goods "attained through communication, where members jointly hold a single body of information". As epitome of this category of good, Fulk et al. (1996) put emphasis on the discretionary databases, which refer to the creation of a common pool for gathering and sharing information, where each member can retrieve information from and at the same time contribute to the provision of additional data as well as the maintenance of the whole system. In this revised context, free-riders are those who do not contribute in a sufficient and thorough fashion to the data sharing, albeit

they continue to enjoy the benefits provided by the information contained in the whole body of data through their retrieval (Fulk et al., 1996). A following and related issue is the difficulty faced when trying to assess and spot a free-rider, given that the noticeability of her can be challenging; as a matter of fact, an individual could contribute information of low-quality, but the actual assessment of that quality can be not as straightforward as hoped (Fulk et al., 1996). Plus, individuals could also opt to provide only partial knowledge possessed by them or focusing on quantity of data instead of quality (Flanagin et al., 2005). In all these scenarios, the revisited free-rider problem revolves around an incorrect, unfair and to some extent deceptive contribution of data and information within the shared body of data by one member, while at the same time enjoying the benefits that come from drawing upon the discretionary pool of data.

Before continuing with the literature review, it is remarkable to underline a specification within the purpose of this work. Indeed, the collective action theory per se is principally concerned with the outcomes and possible courses of events of actions undertaken by *individuals*. This work, however, is chiefly interested in the decisions and choices made by organizations and companies. Our statement and clarification, with respect to this, is that the theoretical background behind the collective action can find a nice fit in regard to the purpose of this work, given that the aim of this thesis is to study the attitudinal and managerial responses of *individuals* working in the organizations involved in the empirical research. That is to say, we are primarily concerned with the interpretations and opinions of individuals regarding some areas of focus, the same individuals that make decisions on behalf of the organization in which they work. In view of this, we can affirm a parallelism between the general idea behind the collective action theory and the scope of this work. Nonetheless, we acknowledge and recognize the need to stress this concept to create a smoother application of the collective action theory within the goal of this work.

2.1.1 Collective action: group size and role of formal organization

The work of Olson (1965) has been of utmost importance in the study of the collective action and the logic behind it. Among his notorious discoveries and theories revolving around the collective action, two features need to be highlighted to better understand what the rationale is underlying the collective action theory and the foundations of its concerns: the group size of the actors involved in the attainment of a common good and the role as well as need of a formal organization to coordinate the various actors.

Concerning the group size, Olson (1965) points out that large groups are more inclined to fail to provide a collective good. According to Olson, in smaller groups the size of benefit accruing to each member is big enough to provide incentives to undergo the costs of providing the collective good; even further, there can be the occurrence in which a member of the collective group has an interest so strong in the provision of the good that he would be willing to bear all the cost necessary to the provision of that (Olson, 1965). This, then, is due to the great portion of total benefit being provided to that one actor. However, also in this case, the total amount of provision of that good would likely be inferior to the optimal level (Olson, 1965). This is tied to the fact that the consumption of the collective good cannot be denied to other group's members, and thus only a portion of the total benefit will accrue to the one actor providing resources to the collective group; besides, the chance to attain the collective good through the contribution of other actors will further reduce the incentives to contribute extensively to the common good (Olson, 1965).

As the size of the group gets larger, the lesser of the collective good will be produced, especially when members of the group bear great inequalities in terms of size and interests in the provision of the good (Olson, 1965). Indeed, the larger members will have a much bigger interest in the collective good, and would also contribute more, compared to the smaller members who would only attain a tiny fraction of the total benefit from the good and subsequently would be less willing to invest a considerable amount of resources (Olson, 1965). Additional problems arising when the group size is too large relate to the point that each group member will gain a small share of the total good provided, and subsequently the extent of the benefits will not be sufficient to cover the costs associated with the creation of the good (Olson, 1965).

With respect to the need of a formal organization to coordinate the efforts of the various players to the provision of the good, Olson (1965) explained how the smaller the group, the smaller the need of having an organization to support the actors involved. Since in small groups a few members enjoy all the benefits from the collective good, they are more prone to work and contribute to obtain it, and they do not consider bearing the tied costs as a major challenge; thus, members of a small group are not in need of a formal organization to thrust them to contribute. At the other end of the spectrum, large groups will require the establishment of an organization to set up the agreement and coordinate the different actors. Furthermore, Olson puts emphasis on how the larger the group, the greater will be the need of a formal organization and subsequently the greater will be the difficulty to achieve it.

To conclude, in “The logic of collective action” (Olson, 1965), three main elements are identified to contribute to the hurdles that impede large groups to perform correctly while reaching out to the provision of a collective good:

- ❖ first, in large groups, a single individual obtains only a tiny fraction of the benefits, and will then have less incentives to contribute to group-oriented actions;
- ❖ since the portion of benefits provided to the actors of a large group is of neglectable amount, there will hardly be enough gains to cover the costs related to the collaboration for the common good;
- ❖ lastly, the greater the number of members in the group and the greater the group, the higher will be the cost required to organize and set up an organization to coordinate the group. This last point, however, is less critical in terms of communication and coordination thanks to the rise of new and ever-faster technologies and means of communication (Flanagin et al., 2005); besides, the cost of these cutting-edge technologies is decreasing over time, making it easier to be accessed by a great variety of actors (Flanagin et al., 2005).

2.1.2 Incentives in the collective action

Given the unlikelihood to obtain a collective good spontaneously by the members of a group with a common interest in that good, some other viable solutions have to be found to address this concern. Olson (1965) stated how the role of incentives can work finely in this context. As a matter of fact, through the use of “selective” incentives, it would be possible to push actors to cooperate and contribute to the provision of the good. The incentive can work in a positive way, thus being a reward for a member who is working toward the group’s interest, or negative, then depicting a punishment to the misbehaving member who refuses to contribute. The most prominent feature of this typology of incentive is that they have to be *selective*, meaning that the incentives have to be precisely aimed at those actors who are not acting according to the group’s interest; in this way, a different treatment will be used for those individuals contributing, in strict opposition to the treatment to those who do not (Olson, 1965).

Oliver (1980) further delved into the role of incentives and punishments in the collective action framework, adding precious remarks. To begin, and in accordance to what stated by Olson, rewards as well as punishments do not necessarily have to be economic; actors could find appealing incentives based on personal values, respect, networking, material prizes different from money and psychological as well as emotional ones. The same holds true for both non-economic rewards and punishments. Oliver (1980)

also pointed out the diverse nature of the rewards and incentives, indicating categories as social approval, prestige and notoriety as undeniably relevant.

Furthermore, Oliver (1980) has explained how before applying any sort of incentive it would be necessary to undertake a preliminary work, in order to understand the actual effects of the selective incentives, either as a reward or as a punishment.

On a side note, a serious downside of the use of punishments as negative incentives lies in the fact that actors may likely react negatively to the punishments, and consequently seek for revenge and hostility. Anger, frustration, tension after the punishment could potentially give birth to an unstable situation between the actors involved in the collective group, and this can result in an arguably uncomfortable climate especially where cooperation and collaboration are required over a long period of time (Oliver, 1980). The punished individual may choose to continue to collaborate since no other chance is viable, but it could voluntarily misbehave again in the future and continue to bear grudge, consequently becoming an untrustworthy individual.

2.1.3 Structural variables affecting a collective action

Among the researchers contributing to the collective action theories, Elinor Ostrom is undeniably in the forefront. One of her precious contributions deals with the provision of a list of structural variables that are likely to affect the successful realization of a collective action (Ostrom, 2009). Indeed, in her field works, Ostrom noticed and highlighted some of the recurring organizational characteristics among the cases she studied, eventually leading to the formulation of a well-thought-of set of variables concerning the very nature of the setting in which the collective action was supposed to occur. Ostrom identified seven structural variables, which will be highlighted and explained hereunder (figure 2.1).

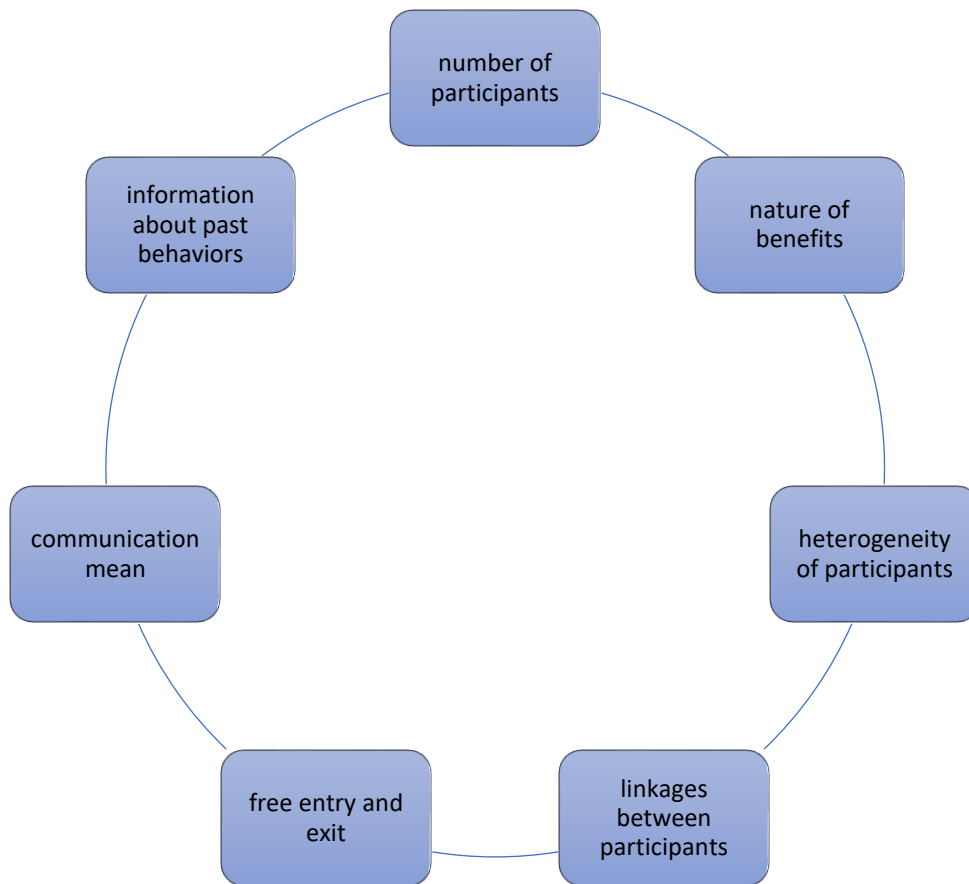


Figure 2.1 *Structural variables affecting likelihood of collective action.*

Source: adapted from Ostrom, (2009).

Number of participants involved

As stated and argued previously, the likelihood of successfully achieving a collective action is inversely proportional to the number of participants in the group (Ostrom, 2009). As Ostrom remarks, the greater the number of participants, the lesser the chance to be caught if not contributing or free-riding, given that the noticeability of this action will be significantly low. Secondly, and stepping back to the role of formal organizations to foster collective actions, the larger the number of individuals and the more the cost and strains necessary to coordinate them, particularly through the establishment of a formal organization (Ostrom, 2009; Olson, 1965). On a different line of thought, Agrawal (2000) posits that too small groups will not necessarily outperform larger groups, since they may fail to obtain the necessary resources, being

the groups, indeed, too small. As a consequence, and even if it all depends also on the typology of good to be provided, a moderately-sized group would be preferable (Agrawal, 2000).

Subtractive vs wholly shared benefits

Based on the characteristics of the good to be achieved through the collective action, it can be defined to be *subtractable* in nature or not. In the first case, the consumption of a good by one individual prevents others from benefitting from it, while in the second scenario the consumption of a good can be fully enjoyed by a vast array of people, without compromising the chance for other individuals to still consume that good (Ostrom, 2009). In the scenario in which the good is not subject to subtractability, as Marwell and Oliver (1993) posit, a larger group can more effectively contribute to the provision of that good, contrary to the original statement of Olson (1965). As a matter of fact, the portion of benefits accruing to each actor would not be compromised by the consumption of other participants, and the incentive to join the collective action would therefore be higher; additionally, the more the individuals, the greater the possibility to rely on a bigger amount of resources coming from more actors (Oliver et al., 1993).

Heterogeneity of individuals in the group

Heterogeneity can relate to different aspects. In terms of interest in achieving the public good, Olson (1965) argued that if there are some individuals particularly interested in obtaining that good, and thus having a different payoff function in relation to other participants, the likelihood of the good be realized would be higher. Conversely, Ostrom showed a substantial array of literature references stating how heterogeneity would undermine the provision of the good, especially with respect to the increase in transaction costs, the need to coordinate utterly different actors, and the significant hurdles to circumvent when having to distribute gains and costs to pursue the collective action (Ostrom, 2009).

On an opposite line of thought, heterogeneity can positively impact the likelihood of achieving the public good when the overall interest of participants coincides, even though they come from different backgrounds or have a dissimilar view concerning the interpretation of rules, norms and idea of trust (Ostrom, 2002). That is to say, two participants considered to be different under some critical features, i.e. heterogeneous, but sharing the same general view of the common situation and upholding the same common interest are more likely to successfully engage in the collective action and contribute. As explained by Ostrom (2002), when two individuals, one with more assets and one with less of them,

share the same interest, there is the concrete chance that the individual having more assets and wealth will engage in the first move and bear the initial cost toward the collective action; after this, rules and regulations would be devised to help participants that share the same interest to cope with their heterogeneous characteristics. As a result, even different actors would be able to collaborate and follow the rules for the common purpose (Ostrom, 2002).

Face-to-face communication

Even though formal theories about collective action still do not take into account the outcomes and influences of inter-personal face-to-face communications, some scholars are demonstrating the relevance of this topic. According to Adolphs et al. (1996), when talking to a person, the brain unconsciously analyzes the possible emotional state of the counterpart. Besides, individuals tend to be “more human” while having to debate about an important and sensitive issue in person, showing interest in the overall gain for the group, and putting aside the selfish part of the human behavior (Frohlich et al., 1998). As a main consequence, face-to-face communication helps the group to achieve a higher level of solidarity, increasing the likelihood that the hoped collective action will be pursued and promises will be kept (Kerr et al., 1994). Tied to these concepts, Ostrom (2009) posits that face-to-face communication can have a beneficial effect on the outcome of a collective action.

Information regarding past actions and behavior of participants

In situations where cooperation and collaboration are sought, a pivotal role is played by the amount as well as accuracy of information about past behaviors and actions undertaken by the individuals involved (Ostrom, 2009). In this setting, players try to label another one based on the past information and actions, in order to understand whether to trust that player and decide to collaborate.

Under certain circumstances, revealing and showcasing past actions by one actor is a chance to build a positive reputation over time among the various participants (Seabright, 1993), in order to foster a more cooperative climate; indeed, showing the willingness to collaborate and stick to the rules of the game can reinforce the likelihood that other participants will also join the collective action for the common purpose (Seabright, 1993) and increase the trust put in that actor.

Furthermore, Janssen (2006) explains how effective methods to monitor current and past actions of the actors involved in the collective action can greatly contribute to help these actors to gather the necessary

information about past events; this, in turn, will contribute to their decision about how to behave in the group as well as whether to participate or not.

How participants are linked

Ostrom (2009), supporting her thesis on the basis of the work of social psychologists, states that the way individuals are linked in the group may alter their willingness to collaborate and contribute. According to her line of reasoning, if, as instance, three individuals are linked in a unilateral way in that the first individual contributes directly to the second one, and this in turn contributes to the third one, and so forth, the likelihood to contribute increases remarkably. This is due to the fact that each individual knows perfectly who has to contribute to whom, and it is consequently easy to spot who is not contributing (Ostrom, 2009). Besides, expectations for the contribution may put social pressure on the individual that has to contribute to the following one.

Conversely, when contributions generally gather into a common pool, there is a stronger incentive to free-ride, given that it would be more difficult to spot the free-rider and individuals can then expect to benefit from the common good even without actually contributing for a longer time frame (Ostrom, 2009).

Free possibility to enter or exit the game

The chance given to participants to possibly exit the group resulted to be an effective enhancer of cooperation, especially in a model developed by Janssen (2008) and described by Ostrom to back up her statement; in this two-person prisoner's dilemma, participants are given the chance to collaborate, defect or exit the game; besides, they are also given symbols that they can use to showcase their intentions and trustworthiness. Thanks to the possibility to figure out the trustworthiness of individuals and the chance to eventually exit the game, levels of cooperation eventually raised significantly (Ostrom, 2009).

To further emphasize, giving the opportunity to individuals to possibly quit the game increased the level of collaboration, probably through the lessening of the pressure put on the participant to get stuck in a wrong decision and bear the consequence of the negative outcome.

2.2 Collective action and the role of trust

The role of trust in helping individuals to achieve positive outcomes in collective actions has been attracting great interest among scholars, and once again Elinor Ostrom places herself as one of the leaders. Indeed, the creation of trust among individuals in the context of a collective action is an essential prerequisite to the accomplishment of the common purpose (Ostrom, 2008). Additionally, if a participant believes that another participant is trustworthy and will reciprocate the contribution, the likelihood of a successful cooperation will raise as a result (Ostrom, 2008).

Besides, a collective action logically entails a close dependence of the participants on each other, and these inter-dependencies are necessary to accomplish the common goal; subsequently, since interaction, coordination and collaboration will be particularly high, a necessarily relevant level of trust will be required to ensure a smooth work between the members of the group (Mayer et al., 1995).

Alongside with this, there is a strong and empirically tested belief that for inter-firms' projects to succeed the role of trust is of paramount relevance (Kadefors, 2004). As a matter of fact, trust can result in a set of helpful effects, such as, above all, a stronger and more solid relationship between the involved participants in the project (Wong et al., 2004). This, in turn, will foster and favor other benefits accruing to the trusting and trusted companies, as facilitating the achieving of a common goal as well as balancing the interests and power of the various actors (Atkinson et al., 2006). More importantly, a great degree of trust can have the superlative effect to encourage partners to share their knowledge about customers, technologies, information, giving birth to new opportunities and the exploitation of synergies from the cooperative work (White et al., 2002). All these features will contribute to create value either to the single organization and to the whole group of organizations as a single entity.

Albeit these aforementioned benefits can have terrifically prosperous effects on the partners joining the collective action, it is far from easy to establish a solid and long-lasting foundation of trust (Maurer, 2010). The first obstacle to circumvent is the possible lack of prior works and experiences with the partner involved in the collective action (Gulati, 1995); this can be detrimental since a firm will not know where to anchor its expectations about the honesty and trustworthiness of the other party and will find itself in an uncomfortably uncertain situation about whether to trust the participant or not (Gulati, 1995). A result of this context is an environment imbued with wariness and suspiciousness, in search for clues to spot the good intentions and willingness to contribute of the participants involved (Maurer, 2010). In such an unsteady context, it is hard for trust to be smoothly built among participants, until they actually start working together and seeing the partners collaborating as well as behaving correctly.

After defining the valuable effects of trust in a collective action problem, it is necessary to highlight what is meant by trust. Mayer et al. provide a quite thorough definition based on the previous work of Johnson-George and Swap (1982), who stated how the willingness to take risks is a common feature concerning all the possible trust situation. Built on this statement, Mayer et al. use in his work the definition of trust as the “*willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor (the party which trusts the other one), irrespective of the ability to monitor or control that other party*”. In their work, Mayer et al. also point out how it is crucial not to confuse the notion of trust with the one of cooperation, since trust can certainly lead to cooperation between members, but it is not the same concept per se. The main difference lies in the fact that cooperation does not automatically put one party at risk, and the presence of trust can also be neglected if there are fairly strong incentives to cooperate even in absence of a feeling of trust (Mayer et al., 2010).

In spite of this definition, the notion of trust is not totally straightforward and researchers are aware that an ultimate definition of it is still not known (Hosmer, 1995). Even so, Das and Teng, (2001) assert that in the field of inter-organizational projects and relationships, the concept of trust boils down to the expectations of a party towards another one in regard to the competence, ability as well as intention of the latter to meet the pre-established obligations and duties.

2.2.1 Factors affecting trust in the collective action

The amount of literature concerning the effects of trust on inter-organizational relationships is ample and consistently gaining more interest in a society in which collaboration and cooperation are the new ways of competing in the market arena. Along with that, it is possible to underscore and analyze some of the factors and characteristics of an organization’s structure or of an individual’s features that help trust to grow and spread through all the participants. In so doing, this work has tried to highlight some of the aspects that were most related to the topic and scope of this project, casting light on their effects on the trust felt by participants in the scenario of a collective action.

According to the study conducted by Ferrin and Dirks (2003), clearly defined rewards play a significant role in enhancing trust among organizations grouped together for a common purpose; as a matter of fact, being sure to benefit from a reward which is based on measurable and objective criteria helps organizations to feel safe to possibly gain the rewards, if the criteria will be met. Thanks to this, trust is

kept growing and a sense of distributive fairness is the main cause of that (Robson et al., 2008). Besides, rewards can reduce the risk of opportunistic behaviors, such as the notorious free-rider problem, which would contribute to shatter trust among members (Maurer, 2010). At the same time, to reduce risks and possible misunderstandings about the distribution of rewards, it is needed a clear and effective flow of information and means of communication, especially in the case in which a considerable number of individuals is involved (Wong et al., 2008).

Inkpen and Tsang (2005) posited how having a stable and fixed pool of project team members coming from the different organizations involved in the collective action would help the formation of trust and foster cooperation. This is chiefly due to the so called “shadow of the past” concept, developed by Poppo et al. (2008); based on this notion, trust among members is a progressive and incremental process that requires time to develop and frequent interactions; in so doing, the various members will have enough time to study their partners, to decipher the real intentions of them and to learn how to properly work together. This step-by-step process, if successful, will lead to the actual creation of a strong basis of trust in the common organization (Poppo et al., 2008). Trust is, therefore, built through prior experiences that help to highlight the trustworthiness of the participants and to define the expectations about their likely future behaviors. To accomplish this outcome, a fixed pool of team members belonging to the involved organizations can turn out to be considerably helpful (Maurer, 2010); indeed, this stable team would allow for continuous communication and feedback among the members, over time, leading to a better knowledge of the interests and characteristics of the actors involved. It is important, however, for this pool to be as stable as possible in terms of members composition, as well as to have full-time employees working in it, so to have them completely committed to the purpose of the cross-organizational group (Maurer, 2010).

In his work, Mayer et al. tried to identify the characteristics of a trustor (the party who has to trust the other one) and of a trustee (the party that has to be trusted) so to define how trust between these two categories of individuals can be successfully established. In this section, this work will focus on the main characteristics of the trustor underlined by Mayer et al., that is, the “propensity to trust”. This concept can be thought of as the overall willingness to trust another party, without currently having any information about that party’s past behaviors. Consequently, a higher degree of propensity to trust would lead a trustor to more easily trust a trustee, irrespective of other factors concerning the trustee (Mayer et al., 1995). As Mayer et al. suggested, propensity to trust emerges from different backgrounds, such as the cultural environment, past experiences, values and norms shared in a specific time and place; though,

it is beyond the purpose of this study to delve too deeply into each of these sub-variables. Another way to define the propensity to trust is borrowed by the work of Sitkin and Pablo (1992), in which risk propensity is defined as the “tendency to either take or avoid risk”. Differently by the work of Sitkin and Pablo (1992), nevertheless, Mayer et al. (1995) consider the propensity to trust as a stable feature that does not change according to different situations, while for the previous authors it does depend on the specific situation in which the participants are. Notwithstanding this, Mayer et al. put emphasis on the role of the context in which the collective action takes place, specifying that even though the level of propensity to trust is fixed, the following effects on it will be determined by the contextual characteristics of the collective action. As such, the balance of power results to be fundamental; by power, in the context of an inter-organizational setting, it is meant the capacity of a player to make another one execute a specific task that otherwise the latter would not have executed (Comes et al., 2016); a disproportional degree of power in favor of one of the participant would possibly create tension, conflict among the rest of less powerful organizations and subsequently leading to a lesser extent of trust; plus, the perception of the risk level also covers a noteworthy role, dictating how a trustor would approach a riskier situation compared to how it would do for a calmer context; lastly, the number of alternatives available to the trustor can also contribute to define the level of trust in another party: the more the number of alternatives, the less the urge to necessarily put a blind trust in just one option (Mayer et al., 1995).

2.2.2 Reciprocity and Ostrom’s model of trust

The theory behind the logic of Marcus Olson’s collective action dilemma is that an individual trying to maximize her welfare will most likely choose not to contribute but to free-ride on the contributions made by other participants (Olson, 1965). The main result of this dilemma is the struggling to reach the accomplishment of the collective action. Under a different perspective, some scholars have raised a different approach to this dilemma, based on a more *emotional* individual state, that is, the logic of reciprocity (Kahan, 2003). According to this theory, and underlying the words of Kahan (2003), “when individuals perceive that others are behaving cooperatively, they are moved by honor, altruism, and like dispositions to contribute to public good even without the inducement of material incentives”. The main takeaway in this statement is that individuals would be likely to cooperate and contribute to the common cause when they perceive and see other participants doing the same, given that this occurrence would arise in them a need to contribute in return, following the steps of individuals in the group. Other researches showing the effects of reciprocity on individuals stem from the work of Solomon (1960).

Solomon aimed at demonstrating the effects of reputation and trust in a prisoner's dilemma game; he asserted that when a player in the game receives cooperation by the other one, she is more inclined to develop a liking for that individual and contributing in return. Oppositely, a non-cooperative behavior will most likely result in a non-cooperative behavior by the player who receives the unpleasant action; as a matter of fact, in the logic of reciprocity, the opposite scenario holds true as well. If individuals perceive that others are not contributing and are free-riding on them, the former will arguably stop contributing and feeling resentment (Kahan, 2003).

Through this method, additionally, the role of incentives could also be of minor relevance, since Kahan (2003) posits that when a strong feeling of reciprocity is created in a setting, individuals will naturally be moved to cooperate, without necessarily being subject to coercive actions or incentives.

Within the context of collective action, as a result, the logic of reciprocity suggests the need to promote trust among the individuals involved (Kahan, 2003). In fact, participants trusting others and believing that these will contribute and stick to their duties will, in turn, respond by cooperating themselves, moved by a sense of reciprocity, and subsequently reinforcing the circle of trust and reciprocity as well (Kahan, 2003). It is necessary, logically, that the trust put in an individual is respected, so that the individual who is trusted to contribute will indeed contribute, nurturing the sense of reciprocity in the rest of individuals. In the hostile scenario in which a trusted individual will not stick to the expected outcomes, the circle of trust and subsequently the one of reciprocity will be severed, and remedies should be devised. Based on the work of Kahan (2003), if an individual does not have faith and trust in another individual, the former will not spontaneously contribute to the common cause just by following the need to reciprocate the expected and potential effort of other individuals, and this will end up in a tense environment in need for other solutions to achieve the collective action.

Ostrom (1998, 2003) also researched on this different approach to solve the collective action dilemma, positing that being able to build a sense of trustworthiness and reciprocity in a group is a cornerstone toward the successful solution of the dilemma. In fact, without individuals trusting others and feeling as a result the need to reciprocate to them, it is particularly hard to attain the collective action without any further interventions (Ostrom, 2008).

Among her researches in this field, Elinor Ostrom (2009) devised an appealing model on the role played by the reputations of participants for using reciprocity and the following effect on the trust put in those individuals by other potential participants, which, eventually, could lead to the use of reciprocity by the

latter. Interestingly enough, the first approach to reciprocity which this work illustrated showed how thinking of an individual as trustworthy will lead to a feeling of reciprocity, while in Ostrom's model there is a step backward, in which reputations for being reciprocators lead to having trust in these individuals and, as a last consequence, to feel compelled to use a reciprocal approach toward them. As cornerstones of her model, two concepts have to be taken into account: the outcome of past experiences and related creation of personal norms, and the reputation of participants in the collective action as former reciprocators.

Concerning the former factor, Ostrom (2009) highlights how past experiences strongly influence the willingness of an individual to engage in risky situations and act as a cooperator or not. Positive experiences would drive the individual towards a more cooperative approach, regardless of the actual amount of information in possess, whilst negative past events related to cooperative contexts would lead to the reluctance of being involved in cooperative situation without some forms of warranty or incentive (Ostrom, 2009). These experiences, ultimately, contribute to the creation of "norms", by which Ostrom refers to as the individual internal evaluation of a particular situation and the proper action to take. As a result, individuals' behaviors in a particular situation are seemingly affected by the initial emotional and normative state, dictated by past experiences in that specific context (Cox, 2004). By means of this framework, the attitude towards reciprocity and trust by an individual can be inferred a priori, before the starting of the collective action and irrespective of the participants involved and their reputations.

In this model, norms can help individuals to decide which action to take in a cooperative context, and they are extremely useful when no information or data is available about the participants; in spite of this, when information about past actions of participants are known and displayed, the use of norms still takes place, but becomes less important, since the main driver of trust and reciprocity would be now based on the reputation of participants as former contributors, reciprocators and trustworthy partners (Ostrom, 2009). Ostrom (2009), indeed, stresses the concept that an individual would highly rely on information and data about past actions and behaviors of other participants, especially in similar situation that needed cooperation and collaboration. Through this process, an individual can obtain an estimate of the risk of trusting a certain participant and the worthiness of taking that risk.

The whole aforementioned framework leads to the explanation of the main model proposed by Ostrom (2007) in regard to the role of reciprocity, trust and cooperation (figure 2.2). According to the Nobel

Prize awarded Ostrom, reputation of participants for having used reciprocity and being good contributor in the past within collective-action situations is certainly impactful on the decision of other actors whether to trust them and decide to cooperate. Indeed, a positive reputation about being cooperative and trustworthy will lead other participants to initiate to cooperate and trust the ones with a good reputation. Plus, this situation will motivate other participants to join the collective action and participate, since they will be shown a group of actors that contribute to the common cause and have trust in each other. As a result, the level of cooperation will increase and there will possibly be the creation of a positive circle of trust and cooperation, based on the good reputations that players are achieving over time while joining the collective action (Ostrom, 2007). In this case too, expectations have to be kept; if a player with a good reputation does not actually contribute, the other player will stop contributing and seek revenge. Furthermore, the role of reputation is arguably massive, but norms are still having a considerable impact inside the various actors involved, and can render the collective action's outcome uncertain, regardless of the actual reputations of individuals (Ostrom, 2009).

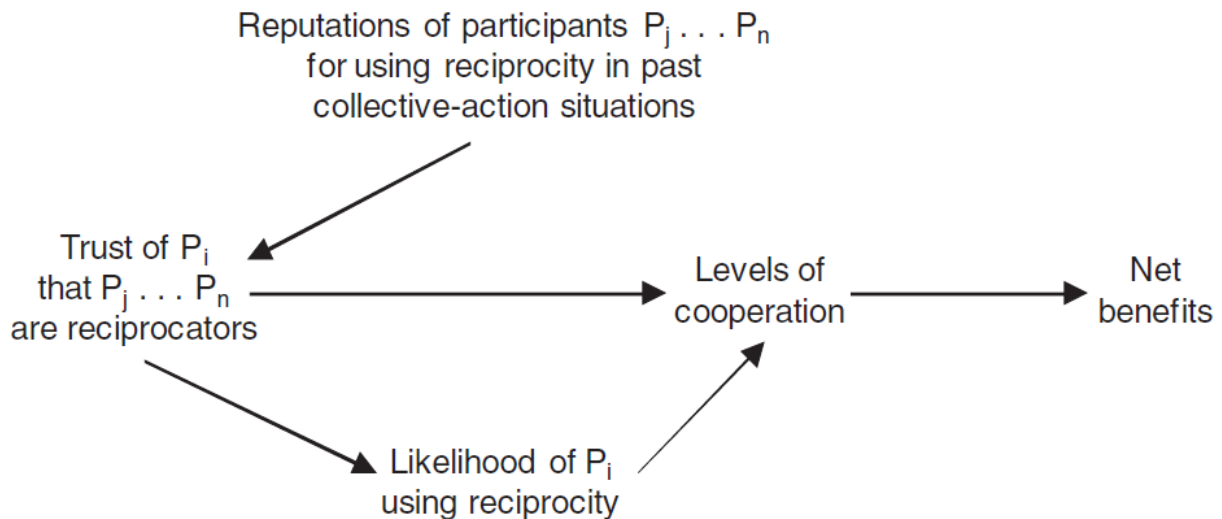


Figure 2.2 *The core relationships at the individual level affecting levels of cooperation in a social dilemma.*

Source: Ostrom, (2007).

2.3 Common-pool resource dilemma

The collective action problem, according to the thought of different scholars, lays the foundation to a set of different issues in the economic theory. Among those, one of pertinent interest is the so labelled “common-pool resource dilemma” (CPR). Common-pool resource issues have been a subject upon which Elinor Ostrom has dedicated considerable amount of energy, time and that eventually have led her to be awarded with the Nobel Prize in 2009 (Wikipedia, 2017). As such, her involvement and contribution within this field is of invaluable usefulness, and therefore her theories will be a precious guide for this work.

In one of the most popular and adopted definitions of common-pool resource, Ostrom (1989) stated that it refers to a “sufficiently large natural or man-made resource that is costly, although not impossible, to exclude potential beneficiaries from obtaining benefits from their use”. A linked result of this is that individuals in a common-pool resource context would tend to take as much as possible of that resource, in a fashion that is over abundant, or else they would try to free-ride on the effort of other participants, obtaining the gains from the shared resources but not contributing properly (Garret, 1968; Gordon, 1954; Olson, 1965). The result, eventually, is the obstacle faced in producing the good and contributing to the common cause, leading to the non-provision or under-provision of that.

This broad and general definition has been subject of different revisions, interpretations and updates over the last years; as Ostrom herself explained (2002), a great number of common-pool resources are described by complicated and complex characteristics and features, which leads to the inevitable creation of different settings in which to apply the theoretical framework concerned. Thus, a generalized and thoroughly accepted definition of common-pool resource is still not at hand, and many scholars have contributed to tweak the definition to adapt it to the changing features (Euler, 2017). The classic framework initially proposed by Ostrom was considering goods in common-pool resources to have two main features: a high degree of subtractability and the great difficulty to exclude potential users from benefitting from them (Ostrom, 1989; 2002). Other scholars have put more emphasis on the notion of common from a different perspective, more tied to the social practice underlying it, instead of strictly focusing on the physical features of the good (Bennholdt-Thomsen, 2012; Muhl, 2013). According to Muhl (2013), a common becomes as such not because of the material characteristics, but in connection to the use and intention of people and communities using that common good, based on self-given norms and rules. Following this definition, commons depend on the typology of interactions, relationships and rules tied to the use of the common good and between the people involved in its use (Helfrich, 2012). A similar definition, geared towards a procedural perspective, assumes that a common can be described by

“the process of using and maintaining resources by a group of people who organize the social process, the communing, themselves and determine the rules of their togetherness” (Meretz, 2014). From these multi-faceted definitions it is blatant how reaching an ultimate statement of the main characteristics and features to clearly define a common-pool resource is not a straightforward task, even if the main arguments are still applicable and applied based on the different contexts in which the common-pool resource dilemma is placed.

Strictly related to the scope of this project, the adaptation of the theories about the commons to the realm of knowledge and information has been an inevitable and predictable occurrence. Indeed, in the inception of the work about the commons, the main goods took into consideration were essentially purely physical ones such as lands or fisheries, to cite a few (Hess, 2000). Nevertheless, as discussed formerly, the notion of common-pool resource has mainly been linked to the concept of shared ownership, participation and social interactions and relationships among the members of a group in managing a particular resource (Hess, 2000; Helfrich, 2012). In explaining that, Hess et al. (2006) points out that in order to be classified as a common, a good does not necessarily have to be rivalrous, meaning that the consume of that good by one individual impedes another one to consume it. To stress it further, the focus is on the idea of sharing a resource for a common purpose and jointly used, leading to the general and broader theoretical background named as collective action (Hess et al., 2006). The natural consequence of this is the notorious set of problems to overcome while facing a collective action, as the one of free-rider as epitome. Interestingly, in the case of knowledge or information, the free-rider problem can have different forms, such as not contributing as agreed upon or deliberately providing the wrong information (Hess et al., 2006).

2.3.1 CPR’s structural variables

In one of her main works, Ostrom (1990) tried to analyze different empirical settings tied to the management of common-pool resources, so to eventually identify a common base on which to build a theory aiming at explaining the success of such collaborative initiatives. In so doing, Ostrom tried to help scholars and researchers by providing a set of so-called “design principles” which are supposed to explain robust and long-enduring common-pool resource institutions. Besides, these design principles are considered as effective means to influence and incentivize possible individuals to join the CPR initiative and collaborate (Ostrom, 1990). Indeed, since these principles are suited to explain successful CPR

institutions, they can also serve as motivation and encouragement to have participants committed to the common cause. Ostrom (1990), however, states that this set of design principles is not to be considered as an ultimate list, but rather as an insightful starting point that need further investigations to test its usefulness. Hereinafter, each of the seven principles will be given explanation (figure 2.3).

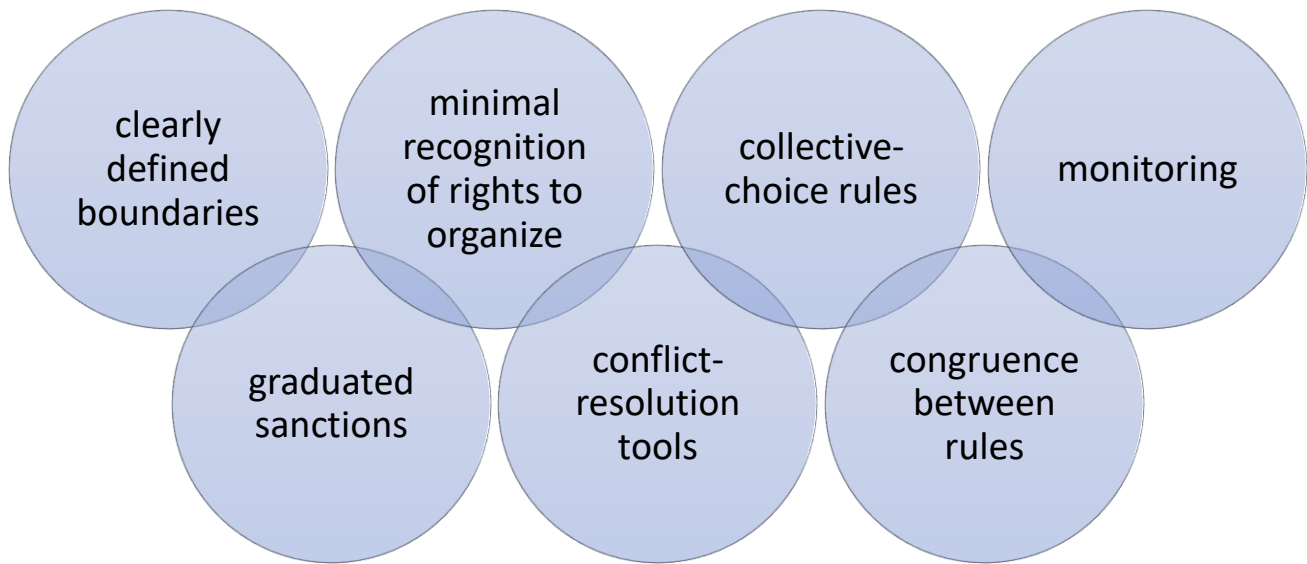


Figure 2.3 *Design principles illustrated by long-enduring CPR institutions.*

Source: adapted from Ostrom, (1990).

Clearly defined boundaries

As a first principle, Ostrom points out the need to have clearly defined and respected boundaries in relation to the use and access to the resource at stake. That is, it should be clear who can access the resource, as well as the boundaries that separate from those who cannot access it. Following the logic of Ostrom, not being sure about which individual can use the common resource would lead to a confusing state in which no one would be willing to manage the resource and to contribute to it. Indeed, it would not be visible for whom the resource is being produced and who is appropriating the benefit of it, possibly leading to the social dilemma where all participants tend to overuse a resource and not to contribute

sufficiently (Ostrom, 1990). On the contrary, closing the boundaries and stating who has access to the CPR would ensure that the benefits will accrue to those who contributed and, consequently, the latter would be more inclined to put efforts in managing the resource and coordinating themselves for the attainment of that resource (Ostrom, 1990).

Congruence between appropriation and provision rules and local conditions

The second principle aims to ensure that a set of appropriate rules concerning the appropriation of the resource and the intrinsic conditions of that one are nicely matched. As a matter of fact, based on the different nature of a resource, a well-tailored set of regulations and rules should be devised so to be sure not to overuse the common resource or to do any damage to it or to its management (Ostrom, 1990). These rules would preserve the resource and make it available over a long period of time.

Collective-choice arrangements

This third design principle states how it is fundamental to provide the chance to the actors involved in the CPR institution and affected by the operational rules to participating in its definitions and modifications (Ostrom, 1990). Firstly, actors involved should be given the chance to contribute to the initial phase during which rules and regulations are defined. Subsequently, participants should have the opportunity to modify, eliminate or add new rules so to find a set that better fits the needs and characteristics of the individuals in the CPR institution and of the overall setting. This is particularly favorable if the task of changing rules is not excessively costly and time-consuming, since otherwise it would be a burdensome job unlikely to be adequately fulfilled (Ostrom, 1990).

A warning that Ostrom highlights, however, is that establishing or modifying rules does not necessarily mean that each participant will comply with them. This leads to the fourth and fifth design principle.

Monitoring

According to the cases studied by Ostrom (1990), reputation of individuals as contributors, or the sharing of norms concerning the importance of keeping agreements, did not result in a sufficient explanation nor a strong enough incentive to follow rules. Consequently, cooperation and collaborative behaviors over the long-run ended up being hindered and threatened. One way found in the various cases that tried to

deal with this problem is the presence of monitoring institutions. Monitoring can be undertaken by the participants in the CPR system as well as a third party collectively chosen by them. One point that Ostrom (1990) underscores is that if shared norms and reputations were sufficient to ensure long-term cooperation, then the need of having resources committed to monitor and oversee behaviors in the CPR system would not be present. Conversely, in all the cases analyzed, some sort of institutions meant to monitor and sanction behaviors were utilized (Ostrom, 1990).

Graduated sanctions

In case a participant would be caught violating a rule, there would be the chance that a sanction may be imposed. More in depth, the sanction would have the feature of being graduated, by which it is meant that the extent and heaviness of the sanction will depend on the seriousness of the infraction (Ostrom, 1990). As found in the cases studied by Ostrom, the role of monitoring and sanctioning quite often were undertaken by the participants themselves, in place of a possible external authority; this is in contrast with what initially thought, namely that the act of monitoring and sanctioning would not be undertaken by individuals in the CPR system (Ostrom, 1990); besides, the initial level of sanction appeared to be relatively low.

The need for having a form of coercion in a CPR system has been linked to the necessity of finding a condition to assure *quasi-voluntary* compliance (Levi, 1988); by that it is meant a situation in which individuals usually choose to comply with a rule even though they are not directly obliged or coerced, and non-compliance is subject to punishments and sanctions. In the CPR context, the internal enforcement of sanctions is aimed at deterring those who break the rules and trying to secure, consequently, the quasi-voluntary compliance, especially in the eye of people choosing whether to stick to the rules or not (Ostrom, 1990); as a matter of fact, sanctions encourage individuals to believe that others will follow the rules, so to gain the common goal.

In regard to the individual who is caught breaking the rules, consequences are not only tied to the direct sanction imposed; indeed, the loss of status as well as credibility can be of major effect on the infringer, leading her to comply in the future (Ostrom, 1990). Initially, then, the sanction has a tendency to be moderate, while it may increase if the rule-breaker keeps on disregarding rules, until the possible exclusion from the CPR system. A second reason why fines and sanctions tend to have different levels

and a graduated pattern is that a disproportionately huge fine imposed after a first mistake would cause too much resentment upon the rule-breaker, and this could jeopardize completely her willingness to contribute and loyally cooperate (Ostrom, 1990).

Conflict-resolution mechanisms

After having analyzed the previous principles, it appears sensible to devise a mechanism to help parties in the CPR system to discuss and debate about possible problems and misunderstandings that could arise from time to time (Ostrom, 1990). Indeed, a conflict-resolution arena is indispensable under the circumstance in which conflicts are born and a solution must be come up with. A technically suggested feature of these arenas, plus, would be them being low-cost institutions, meaning that the process to resolve a conflict is not a burden on all the participants in terms of monetary value (Ostrom, 1990). Secondly, the access to those arenas should be considerably quick, so not to have the problem lasting for too long in the CPR setting.

Minimal recognition of rights to organize

In organizing the CPR institutions and devising its own rules, it is relevant that no external institutions, especially at governmental level, interfere too extensively with it (Ostrom, 1990). Thus, participants should be able to create their own rules and regulations without being uncomfortably challenged by external governmental authorities. If governmental organizations consider themselves as the only ones in charge to regulate a certain field, the ability of a CPR system to effectively work and be long-lasting can be jeopardized (Ostrom, 1990).

Lastly, this scenario considerably varies based on the typology of resource at stake and field of business, taking into consideration that some resources as well as business areas are more relevant and important from a governmental and strategic point of view, and need deeper control and supervision (Ostrom, 1990).

2.4 Key factors for a successful collective action in the Big Data field

Through this extensive but necessarily not complete literature review about the theories behind a collective action, we were able to identify some of the main variables linked to the increasing of the likelihood of attaining a concrete common action by all participants in the pursuit of a shared goal.

To the purpose of this study, the theoretical framework aforementioned will serve as a basis on which to anchor our empirical data collection, by devising our own model drawn from the main variables and features mentioned in this context.

The main idea behind this model is that the role of factors tied to the trust issue in collective actions, in tandem with the ones linked to successful structural and organizational features within the same context, will work positively toward the encouraging of a player in joining a common project, that is, to participate to a collective action.

Due to time constraints as well as to academic requirements, it was not possible to include all the main sub-topics and areas presented in this literature review within the model applied to the empirical research. Subsequently, we have been screening the different factors and areas of interest, followingly including in the model the ones considered to be the most important and insightful tied to the particular context studied. Besides, through the interviews it emerged which features seemed to be most relevant, further helping to understand which variable to include and which one not to.

Lastly, this model will guide our empirical analysis and ensure we will not lose focus of the main topics, as well as provide a strong theoretical basis to build upon new theories and insights (figure 2.4).

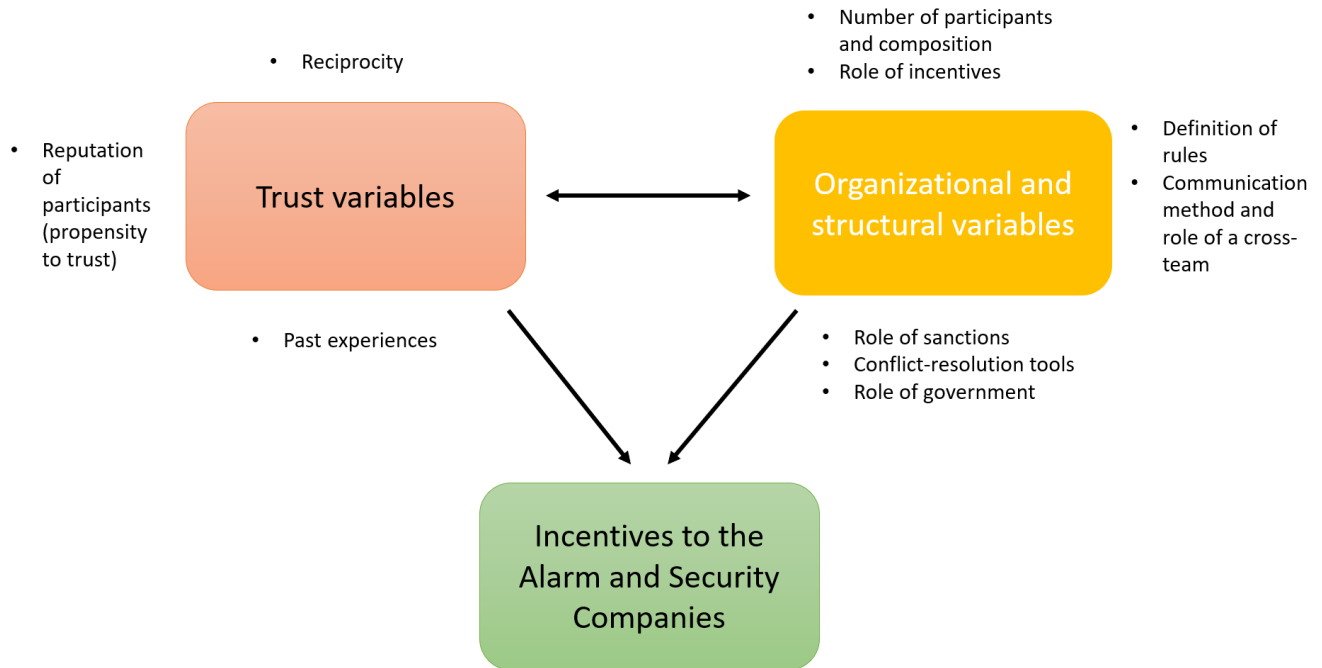


Figure 2.4 *Key factors for a successful collective action in the Big Data field.*

Source: own elaboration.

3. METHODOLOGY

3.1 Research strategy

The main aim of this study is to understand and find out which factors can work as incentives in encouraging companies to join a collaborative project in the context of Big Data sharing. The collective action in this case refers to the actual creation of a sustainable and well-thought-of Sandbox Model, where all the participants are willing to participate and embrace the initiative proposed by SBF. This work, plus, is mainly interested in companies belonging to the Alarm and Security Industry. In accomplishing this task, we profited by the help of a set of areas and topics concerning the issues of trust and organizational features in determining a successful collective action. This way, our research had a clear guidance and strong starting point to answer our research question.

In order to achieve the goal of this research, we aimed at collecting the point of view and opinions of managers and academics so to let emerge the factors working as incentives and the ones possibly hindering the collaboration project at the other end of the spectrum.

Nonetheless, to further emphasize, the previously illustrated theoretical background will work as backbone of this work, guiding the research and defining a pathway to be followed so to address our research question. As a matter of fact, concepts can be used to provide a general sense of reference and guidance in approaching empirical instances (Blumer, 1954). By doing this, theoretical concepts have to be used in a way so to provide a general sense of what to study and to look for and reveal the different forms and role that a phenomenon can assume (Blumer, 1954).

In answering the research question, thus, our focus will be in understanding how the main managers of the Alarm and Security companies, as well as experts from the academia, illustrate and discuss about factors which may work as incentives, or disincentives, to entice companies to get onboard the Sandbox Model; this investigation will rely on a strong theoretical pathway to help us conduct a meaningful research and cover all the most important sub-topics.

To this purpose, a qualitative research seemed to be the most appropriate research strategy to implement. As a matter of fact, through a qualitative analysis the actual point of view and beliefs of the interviewees will have the chance to emerge. As showed by Bryman and Bell (2011), by relying on a

qualitative method the emphasis is put on the world and the social phenomenon as perceived and seen through the eyes of its participants.

Building on this, new concepts and theoretical features could arise, confirming what was already posited by scholars or generating new streams of theory. In this way, a qualitative approach will allow us to conduct the empirical research following the main topics illustrated by the model shown in chapter two, and eventually highlighting the role of the different factors as incentives or disincentives in the pursuit of the collective action concerning the SBM.

Furthermore, this type of method is of undeniable usefulness when having to provide a rich and illuminating body of empirical data in order to understand the uniqueness of a situation (Eriksson and Kovalainen, 2008), which in this case is related to the specific context of companies belonging to a determined industry and the focus on Big Data as the element underlying the creation of the partnership. Lastly, a great advantage and characteristic of the qualitative approach is its flexibility. In fact, this method allows for adjustments and corrections if needed, during the process of refinement of findings, helping to deliver a more insightful and thought-provoking report.

During this study, the critiques of the qualitative research were taken into account. The influence of personal biases and opinions, as well as the potential tendency to an excessive and reckless generalization were kept at bay, trying to pursue a diligent and careful approach to the subject of this work.

3.2 Research design

With respect to the research design, a premise needs to be taken into account. As a matter of fact, the context of this work could find application in either a single case study or a multiple one. Indeed, we could have chosen to focus on the Sandbox Model in itself, stating it as the main case to work on, and conducting the empirical research on the different stakeholders. However, we considered more opportune not to think of the Sandbox Model as a full-fledged case study, in light of the fact that this project is still at a very early stage, and we assumed it was too early to think of that as a case study per se. Subsequently, we believe that in the future, when companies will effectively be involved in this project, and further steps will be taken, the Sandbox Model might be studied as a single case study. Having stated this, we opted for a multiple case study, where we put more emphasis on each organization in itself, subtly detached from each other, but within the same overall context of the Sandbox Model.

Consequently, this research will rely on a comparative design, where the same method of research will be applied to all the cases studied, so to favor the understanding of a social context and phenomenon

thanks to the comparison of cases. Indeed, the main goal of the work is to gain a deep understanding of how the different interviewees perceive and evaluate the theoretical areas outlined and build our conclusions upon that. In so doing, the various case studies will be analyzed and then compared, fostering the creation of theories and concepts as well as relevant discrepancies between theories and findings. In fact, by contrasting and comparing the findings from each case it will be possible to highlight what is unique and what is common between the cases, promoting the creation of related theories (Bryman and Bell, 2011). Theory building, nonetheless, is one of the strongest argument in favor of the comparative design, since the researcher finds himself in a better position to understand where theory holds and under which circumstances it does not (Bryman and Bell, 2011).

The comparative design, furthermore, allows us to focus on the specific and unique context of each case, before letting theoretical reflections to arise (Bryman and Bell, 2011). As a matter of fact, the very starting point of the comparative design is the single case study, by which it is meant an intensive and detailed analysis of a single case, putting particular emphasis on the nature and unique features of that case. This method, thus, is well suited when having to deeply delve into a certain situation and try to elucidate its main characteristics (Bryman and Bell, 2011).

Apart from the cases related to the companies within the Alarm and Security Industry, this work contains the contribution of academics, so to obtain their point of view on the main subject of this thesis, namely the role of the different factors involved. Afterwards, these data were used to provide additional empirical material to be analyzed and compared along with the empirical data directly coming from the involved companies, reaching a wider and more comprehensive understanding of the theoretical elements.

3.3 Research method

In this section we will highlight the main methods used to gather secondary data and primary data, as well as the data analysis, the formation of the sampling and the features concerning the quality of this research.

3.3.1 Secondary data collection

Initially, the collection of relevant secondary data was undertaken, and it concerned the literature review showed mainly in chapter two of this thesis. The concept of collective action has been the very backbone of the whole theoretical section, from which it followed the role of trust in assuring a fair and proper collaboration between companies taking up common projects and the role and dilemma tied to the common-pool resource context, in which a single resource is shared between more individuals for a common goal. Through the literature review, the main areas of interest of the model implemented in this work have been identified, and they served as the basis upon which to anchor the semi-structured interviews, being a guidance for the empirical findings.

The secondary data collection took the form of mainly academic articles and books. Relevant literature was principally retrieved from online databases such as Scopus, Google Scholar and Web of Science. Before accepting an article or a book, it was checked the reliability and importance of the source, through the number of citations as well as the presence of a peer-review. Besides, the accuracy and relevance of the content was assured, through the use of relevant key words in tandem with inclusion and exclusion criteria. To the purpose of this work, two renowned authors and scholars were consistently present among the main articles and publications, namely Elinor Ostrom and Marcus Olson.

A following method of secondary data collection relied on the so-called snowball effect, where citations and sources present in an article or book served as new sources for finding additional important material.

3.3.2 Primary data collection

The method chosen for the collection of primary data is the qualitative semi-structured interview. By using this method, it was possible to address the main issues of this work while simultaneously rely on a degree of flexibility during the whole interview. Indeed, during the collection of primary data it was possible to change the order of the questions, to ask follow-up questions and to come up with new ones so to better address our main goal (Bryman and Bell, 2011). Besides, the semi-structured interviews allowed us to ensure that the most important topics, mainly derived from the theoretical model, were nicely addressed and reflected upon by the interviewees. In so doing, the interviewees were left freedom and leeway to side-track and divert from the topic asked, so to facilitate the emergence of their point of view and any possible relevant feature to build upon new theories and explanations (Bryman and Bell, 2011). As a matter of fact, during the process of data collection it was important to help the interviewees to come up with their vision and opinion on the various topics, so to give explanation to a phenomenon through the lens of their eyes.

After the interviews, it was created the transcript of them, which helped to analyze the contents and create the findings. Along with the transcripts, notes and reflections about the interviews were taken, so to render the work more reliable and reflective, and clearly show all the main steps as well as setbacks during the collection of primary data.

Finally, an interview guide was the main instrument used while conducting the interviews, where questions were carefully labelled using different colors in order to be sure to ask the most important ones and to possibly rely on secondary questions to delve more deeply into a topic.

3.3.3 Sampling

For the undertaking of this work we were working in tandem with First to Know, a consulting company located in Sweden which took up a project by SBF, as explained in the introduction. Consequently, both First to Know and SBF helped us to find relevant companies belonging to the Alarm and Security Industry to ask for interviews. Additionally, the typology of people to be interviewed within these companies were managers with experience in that field. This was important to have relevant sources where to gather information from and to benefit from the great degree of expertise and experience borne by these individuals. Plus, their role in the company allowed them to provide significant and accurate answers in relation to the main subject of this work.

Along with managers from Alarm and Security companies, we believed it was remarkably important to include in the generation of primary data experts coming from the academia in terms of Big Data management and innovation. Through this method it was possible to collect noteworthy opinions and the point of view of people not directly involved in the industry analyzed by this work, but nevertheless having a high degree of competence within this context. Indeed, their help was of notable usefulness since it permitted us to generate a more accurate analysis and to provide additional material to work on, subsequently leading to the attainment of a more comprehensive and detailed understanding on the topic studied (table 3.1).

Name of interviewee (job position)	Company (domain)	Type of interview	Length	Identification letter
Carl Billton (Head of Sales and Marketing)	Raybased (alarm and security industry)	Face-to-face	50'	A
Mattias Hultman (Business Developer)	Sector Alarm (alarm and security industry)	Face-to-face	45'	B
Daniel Yar (CEO at Eductiv, Ass. Professor Innovation and Data Science)	Eductiv / Högskolan i Borås (academia)	Skype	35'	C
Henrik Jaldell (Researcher in Economics)	Karlstad University (academia)	Skype	30'	D
Johan Granton (Country Divisoin Lead)	Siemens (alarm and security industry)	Skype	55'	E
Andreas Persson (Product Specialist, Field Operations Development)	Verisure (alarm and security industry)	Skype	45'	F

Table 3.1 *list of interviews.*

3.4 Data analysis

To the purpose of this work the method used to analyze data relied on the grounded theory approach. Subsequently, after each interview it was create a transcript of the same, leading to the simultaneous analysis of it soon after. The process used was based on the open coding technique, which allowed us to examine data and afterwards conceptualize them and, eventually, put them in different categories. The comparison of the data was a significant and important part of this method, leading to the understanding of the phenomenon and the explanation as well as formulation of possible theories (Bryman and Bell, 2011). In fact, the main findings and conclusions of this work derive from the comparative analysis of the cases involved in this project, keeping sight of the theoretical framework where we started from.

While doing this, particular emphasis was put on the finding of relevant patterns and recurring relationships among the data collected and coded.

To the goal of analyzing data, great importance was given to the systematic literature review. As a matter of fact, from the theoretical framework it was possible to draw the model used in this work and the related areas of interest to investigate. This, indeed, worked as a basis for the formulation of the semi-structured interview guideline to collect empirical data. Eventually, the collected data were put in this process of analysis based on the grounded theory approach. The method of categorization, identification of meaningful patterns and recurring concepts and, lastly, the definition of theories and recommendations were the last steps of this project.

3.5 Quality of the study

Reliability and validity are two of the main criteria to look upon when evaluating the quality of a qualitative study. However, Guba and Lincoln (1985) introduced a slightly different perspective to apply. Indeed, in their opinion, reliability and validity should be substituted with more suitable criteria in relation to a qualitative research. We will follow their method to assess the quality of this study, believing that this is a more accurate and reliable way to evaluate a qualitative research.

The first criterion refers to the credibility of a study, by which it is meant to what extent the findings of a researcher are credible, especially in a dynamic social environment that could account for multiple explanations (Bryman and Bell, 2011). To begin with, the whole work is based mainly on the theories of two notorious and trustworthy scholars as Marcus Olson and Elinor Ostrom, which contributed to provide this work a reliable and strong basis to start from. Secondly, all the empirical data were collected and transcribed, in tandem with the taking of notes so to be sure to have a more holistic view on the analyzed context. Finally, during the interview it was frequently asked the interviewee to rephrase a concept or to confirm if it had been understood correctly, in order to be sure that some tricky or controversial points were made clearer. Plus, all respondents received by email a copy of the transcription with the request to go through it and point out any possible misunderstandings or inaccuracy.

The second criterion to take into account is transferability, which determines whether the findings of a work can be generalized and applied to other contexts (Bryman and Bell, 2011). This is one of the greatest issues in relation to a qualitative study, since it is often concerned with the analysis of a specific social context and its particular features, and generalizability of outcomes if somehow hard to attain. However,

a rich body of notes during the process of data collection was taken, so to give others the chance to evaluate if the particular context being study in this work and the following results can be transferred to different contexts and cases. Besides, a multiple case-study helps to make the findings more generalizable, given that it implies the study of different cases, broadening the scope of the research and the perspective taken into account. Finally, the purpose of this work is not to offer generalizable findings, but to provide an answer to a well-tailored research question which is built upon a specific context. Therefore, the role of this criterion is not of primary importance given the goal of this work.

The third criterion is the dependability of the work, that parallels the criterion of reliability. To assess the merit of a research in terms of trustworthiness, Bryman and Bell (2011) suggests using an “auditing” approach. Addressing this issue, we kept track of all the main stages of this project, of the main setbacks and we took notes during and right after the collection of empirical data, so to show the most prominent occurrences during the data collection. Furthermore, as already stated, all interviews were recorded and transcribed and the most relevant parts showed in the chapter four of this work.

The last criterion is confirmability, which is concerned with ensuring that the greatest possible degree of objectivity was used during this work. However, Bryman and Bell (2011) underscores how a complete degree of objectivity is not reachable in a business research. To the purpose of this criterion, it was our duty and intention not to let our personal biases and beliefs to interfere with the research, trying to analyze the whole work in the most professional and objective fashion.

4. EMPIRICAL FINDINGS

4.1 Case companies

In this section we will present the companies involved in the empirical data gathering of this project, so to give an overall overview of the context and favor a better understanding of the results.

Raybased

Raybased is a relatively young company which started its operations on a limited scale in 2011. After that, it has started working on the development of an open wireless platform for advanced building automation.

Indeed, the main purpose of this system is to make possible the design of applications to control and optimize building functions, such as ventilation, lighting and security (Raybased, 2018).

The main source of Raybased's system is found in the technology described as Internet of Things applied to the scenario of building automation.

In terms of target, Raybased is principally aimed at reconstruction of existing commercial properties, where often the great need of improving the efficiency of the energetic system comes into play.

Verisure

Verisure is the biggest player in Europe within a wide range of home alarm and connected smart home products and services. As a matter of fact, Verisure's home alarm is the most widely installed home alarm in Europe (Verisure, 2018)

The company has been founded in 1988 as part of the company Securitas in Sweden. Verisure has currently 2 million customers and 9000 employees worldwide, placing itself as number one in Europe and rapidly growing in South America.

The main function of Verisure's products and services boils down to the connection to a 24-hour monitoring dedicated alarm center, free security officer callouts and professional installation.

The company is intensely focused on the satisfaction of customers and quality given to them, and in Sweden it accounts for about 300.000 clients, labelled to be among the happiest ones within the Alarm and Security Industry (Verisure, 2018).

Sector alarm

Sector alarm is the second biggest company in Europe in the industry of home alarm and connected smart home products and services, placing itself just below Verisure, undeniably the leader in this field. Currently, it has 200.000 customers throughout Europe (Sector Alarm, 2018).

Sector Alarm is also concerned with the provision of security products and services for private housing as well as small businesses.

The company has been established in 1995, and is employing around 1700 workers. The company is rapidly expanding and today is conducting operations in Finland, Norway, Sweden as well as Spain (Sector Alarm, 2018).

One ambitious goal of Sector Alarm is to become the leader in Europe in the security solutions products and services, surpassing Verisure.

Siemens (ingenuity for life)

Siemens (ingenuity for life) is one of the greatest players in the world while talking about the energy landscape and the related challenges. It is a German conglomerate company with headquarter in Berlin and Munich, and the largest industrial manufacturing company in Europe with branches all over the world.

The main operating areas of the company are Industry, Energy, Healthcare and Infrastructure and Cities. Siemens, in tandem with its subsidiaries, employs around 372.000 workers worldwide, and the global revenues amounted to about 83 billion euros in 2017 (Wikipedia, 2018).

Siemens is a colossal company, but for the purpose of our study we were mainly interested in a sub-area of Siemens's core activities: Energy and Infrastructure and Cities. One of the main purposes of these two areas is to create more efficient and environmentally friendly cities and buildings. This would be achieved through Siemens's mastering of the new digital and intelligent technologies as well as energy-related products and processes (Siemens, 2018).

As witnessed by their site, its mission is to improve life in many areas, through the passion for technology, for customers, society and each individual.

4.2 Findings

In this section we will present our empirical findings, and in doing so, as already stated, we will follow the theoretical model used within this project as a clear guide. Thus, the ten main areas or sub-topics identified for the purpose of this work will be the main guide and framework to present the empirical findings.

The first part will focus on the factors linked to the role of trust. Secondly, the focus will be moved onto the most critical organizational and structural features linked to the successful attainment of a collective action.

4.2.1 Trust-related factors

Reputation of participants (propensity to trust)

With respect to this variable, our aim was initially to understand how companies evaluate a collaboration proposal, if there are some protocols or policies in place. Afterwards, respondents were asked about the importance of knowing beforehand about the reputation of potential participants as good collaborator or generally righteous organizations, and the weight that this would have when deciding whether to join or not a common project.

In evaluating a collaboration proposal, deciding whether to take up a new opportunity, respondent A clarifies that his company is very young and there are currently no standard procedures in place. Furthermore, he explains how “in the past we just focused on the goal of the partnership to see if there may be a common goal and if that common goal could be beneficial for both us and the partner. We want to generate business for each other, a win-win situation” (respondent A).

Based on a more utilitarian and individualistic perspective, respondents B, D and F shift the attention to the potential own gains and benefits attainable. In effect, respondent F would assess the potential chance to learn from the collaboration as well as the financial profit to draw from that. On a similar line of reasoning, respondent B clearly states that they would try to understand “what is in for us”, and the benefits they could obtain from the collaboration, either financial or not. Eventually, respondent D, apart

from the personal gains achievable, focuses on the “personal utility to the common cause” and the notion of “reciprocity”; stating his words, “if someone helps you, you help him, even if you are not so keen on doing that”.

Respondent E shows and deconstructs his procurement model, composed of many different aspects to take into account. Firstly, to share and commit to the same goal, as well as the same ethics and morale. Besides, “the potential partner has to be supportive of the brand and not harmful, and it has to be able to fulfil its expected duties and requests” (respondent E).

It is, lastly, noteworthy to underscore that no company is currently developing methods or working on projects close to the Sandbox one, being this a contextual feature that might be relevant when appraising a collaboration proposal.

Presenting the speech of respondent A in relation to the role of reputation of a potential partner, “it depends on how tight the partnership has to be. So, the tighter it is and the more important the reputation and some additional information will be. We usually want to operate in a lean way, where we want to test our partners overtime”. Moreover, and following the path of respondent A, participant E underscores the relevance of this feature in relation to the context in which the assessment of the collaboration takes place. In fact, in the company where respondent E works, the reputation of a potential partner is quite relevant when evaluating a supplier, in view of the fact that they would look for customer-driver companies.

Furthermore, respondents B, C and D completely acknowledge the importance of having the chance to know about the reputations and past experiences of potential partners, labelling it as “crucially important” (respondent D); nonetheless, more comments and factors come to light when examining this variable; indeed, respondent B goes even more in depth and specifies why reputation would be a remarkable factor: “reputation makes a huge difference. We would only work with partners that have been in the market for a lot of time and that have an history as trustworthy companies; and, also, they should present a certain size”.

Respondent C describes reputation as “really important”, and subsequently adds a noteworthy thought on that, namely that “trust is not really created through past experiences of companies. It is created interacting together, creating value together. Reputation of potential partners can be an initial will to test if there might be a basis on which to build trust”.

Reciprocity

In regard to this factor, the purpose of the questionnaire was to highlight the possible outcomes and behaviors of companies facing different contexts in which other companies within a common project behave accordingly to the rules agreed upon or not. Plus, a fictional scenario in which other participants contribute more than expected was also submitted to the interviewees, so to understand the consequences of that.

Through this investigation, finally, the behavior and contribution of a company in relation to the ones of other companies in the same group was meant to be showed.

A recurring statement among respondents refers to the actual consequence of a company misbehaving or not contributing as it was supposed to. As a matter of fact, each of them posits that this scenario would certainly have an impact on the company's behavior and contribution.

Respondent A affirms that “the first thing I would do is to get the misbehaving organization back on the right track. If I am expected to follow the rules, then also others do”. Respondent C underlines how this would be a major damage to the collaboration, whereas respondent B shows an analogy between a business and a personal relationship, where “if you get but don't give, well, that would break the trust and hurt the relationship. And when you are burnt once you don't want to get burnt again and become more suspicious”.

Differently from the previous ones, respondent F is less drastic and severe, explaining how his company's response would depend on the number of participants involved; in fact, “if there are many participants, you can't expect everybody to contribute as the others and it is less likely to be caught up not contributing as established; but if there are a few ones, we will likely stop sharing” (respondent G).

In the scenario in which one or more companies would contribute more than due, respondent A is careful, stating that, above all, it would be important to understand if the extra contribution of those companies could be positively used and lead to extra gains; next question he poses is “if those extra 5 units can be used, then the whole contribution system of the Sandbox should be revised to create a new standard where companies have to provide a greater quantity of units”.

Participant C, furthermore, draws attention to the fact that organizations would certainly appreciate a company overcontributing, but it is not straightforward that those companies would overcontribute more in return; in fact, respondent C explains that “usually companies have limited resources and calculate how much they can use and provide in a collaboration”.

Differently from the two previous respondents, interviewees B and F would positively react to an over delivery by a company in the project; interviewee B still relies on the analogy between business and a normal relationship, where receiving more makes you more prone to give more, as a result; similarly, interviewee F puts emphasis on the emotional effect of an over delivery, which would bring “more energy and enthusiasm” in the project, leading to a greater contribution from the other companies.

Past experiences

Within this context, our aim was to uncover how past experiences of collaboration and partnership of an organization might influence its willingness and openness towards new collaborations and common projects, mainly based on the outcome of previous partnerships, either positive or negative.

Respondent A explains that his young company has not yet had particularly deep and close partnerships, even if it is currently involved in some. Besides, current partnerships are performing positively, and the interviewee, consequently, believes that “your experiences will shape the policies for future collaborations”, adding a noteworthy thought on the role of “finding a common and shared goal, otherwise it would be difficult to motivate other companies to have a good collaboration”. Respondent B underlines how having a bad collaborative experience would break the trust with that particular partner and would make you more aware the following time you need to decide whether to take up a new collaboration proposal, with the same partner as well as with new ones.

Respondent F shows the expanding network of his company, and the positive outcome of previous experiences of collaboration, creating an atmosphere of openness in regard to new opportunities.

Lastly, interviewee E is in agreement with the role of past experiences on the attitude towards new partnerships, and adds on a side note that “this way you learn how to be part of new ideas and get into new industries and harness trends”.

4.2.2 Organizational and structural factors

Number of participants and group composition

In regard to this feature, we were trying to understand what a reasonable and fair number or approximate quantity of participants would be within this project, after having accounted for the peculiarities of the Sandbox Model.

Besides, part of the questionnaire was also aimed at understanding how having companies coming from different industries and presenting different structural and organizational features would be seen, either as a desirable characteristic of this project or not.

By and large, respondents are presenting contrasting thoughts towards the optimal number of organizations within the Sandbox Model, being, however, open to modifications overtime. Indeed, as respondent A states, “I would start with a kind of project manager to involve stakeholders as they become needed. I would start out with a few departments, just to get started soon”. Respondent F goes even further, trying to provide a quantifiable number: “I would start with around five to seven companies. It is easier to organize meetings and coordinate”.

On a different line of thought, respondent E would opt for many companies, especially in view of the fact that the Sandbox Model is about sharing and creating a huge amount of data. Similarly, respondent B posits that “the more the better! Because you can have more contributions from more angles and have different data. Sharing makes more sense”.

Respondent C outlines one possible outcome of having a greater number of companies involved, namely that “if the network of companies gets bigger, then more coordination effort would be needed, but you can’t know it beforehand”. Followingly, respondent E underlines how complexity is increasing as the number of companies grows, in particular with respect to finding a common goal to share.

Besides, the number of companies could potentially grow in the future, since “even if some difficulties may arise the greater the number of companies, if you need more companies then you have to face it” (respondent C); plus, as already showed, respondent A is inclined to increase the number of companies as they become needed, especially because this is something you can’t know beforehand (respondent E).

With respect to the composition and heterogeneity of the companies, the main idea proposed by the respondents is the positivity of having different companies from different industries. Respondent B identifies as positive having different companies, as well as respondent E who affirms that “in the case of the Sandbox to share data I would go for many different kinds of companies”. Respondent F would prefer to “have a few large companies with more knowledge and more resources, than many ones with poor experience”.

Role of incentives

Concerning this point, interviewees were asked to identify the best ways to motivate and incentivize companies within the Sandbox Model to stay committed and comply with the main goal of the project, and subsequently talk about the potential role of incentives and the preferred ones.

Respondent A would keep the focus on the common goal, in fact, “if you manage to find this shared purpose, that everybody participating can believe, then keeping them focused and motivated is generally easier”. Under a close perspective of sharing, respondent E would share success and failures through a system which he calls *gains and losses*, where each participant has an interest in helping the other ones to succeed and perform greatly; this is tied to the fact that the final and general outcome, either positive or negative, reached by the Sandbox Model will determine the nature and quantity of the benefits accruing to each company, equally.

Participant B would engage the organizations’ members to the directing board of the Sandbox Model, since “if you are within a company board then you feel more committed and responsible”; in spite of this, he is not so keen on relying on incentives to have the companies to opportunely collaborate and contribute: “I think in business you don’t need incentives because if you don’t stick to the rules you’ll get kicked out”.

Under a different line of reasoning, participant C and D would put the emphasis on the value that can be extracted by an initiative like the Sandbox Model; however, when talking about value the stress is not solely on the financial rewards achievable, but on a broader level about the gains and benefits which can be attained through this project.

Communication method and role of a cross-team

This factor has been the main subject when facing the role of communication and coordination through companies in the Sandbox Model. More specifically, we were trying to identify which methods or systems of communication and coordination may be the most preferred ones and the reason why. Besides, the notion of cross-team was presented and, subsequently, we sought to highlight the potential role of this in order to improve communication and coordination across actors.

When starting the interview relating to this point, all respondents expressed their view on the best communication tools and the possible issues of these days. Respondent B affirms that in his opinion there are no longer serious issues in regard to assuring an optimal communication within an organization and across different ones, being this an “already figured out issue”, especially through “regular meetings where we discuss everything”. Respondent C seems to build on the words of the previous one, remarking additional tools to take into account; indeed, digital tools and their availability “24/7” is the most important as well as prominent feature of today’s way of communicating and coordinating (respondent C), but, along with this, there has to be “transparency and fairness” when providing information, feedback and prompting commands.

Respondent F describes his most functional and effective ways to achieve communication and coordination, that is, the implementation of structured meetings and the role of a “sort of project leader that makes the agenda, invite all people to the meetings and raises the moral and energy” (respondent G). Respondent A puts emphasis on the content of the communication, which would require different methods, while Respondent E, differently from respondent B, tries to show how communication is still one of the main issues in organizations, especially because “we need to understand that people are always seeing things with their lenses. They have a sort of *black box* in their mind that acts as a cognitive bias”. When delving into the role and potential usefulness of a cross-team, opinions and reflections of respondents were not so welcoming in regard to this system. Indeed, aside from respondent B which would rely, if necessary, on a cross-team, other respondents were showing some hesitations and additional explanations conflicting with a full, stable and thorough use of a cross-team. Respondent A highlights how “a cross-team can help to inform everyone about each organization’s needs and voices. However, there is a trade-off between velocity and quality”; as a matter of fact, in his statement a cross-team can ensure a higher level of quality and accuracy in reporting info, communicating and coordinating efforts, but on the other side this might slow down the processes, since you would need to organize the team, meetings and related issues. Respondent C would opt for a cross-team initially, in fact, “to start it would be useful to understand what is needed to create the collaboration. Later on, though, no need is seen and there should be other methods; I wouldn’t rely on a fixed group of people”.

Respondent E insists on the utility of a cross-team to help participants to share visions and different perspectives, emphasizing the fact that people have troubles acknowledging others’ ideas and visions and, consequently, a cross-team would face this issue; in spite of this, a long-term application of it seems not so necessary and desirable in his own statement and belief.

Definition of rules

With respect to this area, we tried to investigate how the initial formulation of rules and regulation of the Sandbox Model should be executed through the eyes of the interviewees, who should participate to it and any other remarkable features related to the overall establishment of the guidelines of the model.

Respondent A starts out asserting that the definition of the rules in the beginning of the project should be a preoccupation of the core team initiating the project; plus, “there has to be a predefined set of rules so that you know where you are going. It is always easier to make suggestions later on” (respondent A).

Respondent B believes that it should be a task of the “leader” of this project, who “has the responsibility to make rules and then have everybody agree upon them”; moreover, it should be a leader coming from a Non-Profit Organization. In respondent B’s opinion, the definition of rules is a learning process, where you “learn and adapt the rules to the new needs along the way”.

Respondent E follows the previous statements, dictating the need to have an initial framework to lean on, and subsequently “define the interpretation and development together, based on how we see the initial framework”.

Interviewee C puts particular emphasis on the transparency and openness towards all companies while defining the initial set of rules, ensuring that everybody is sharing its own idea. Nonetheless, “not all organizations should be involved. There is the need for experts to work on that”; after the initial formulation of the draft, the outcome might be open to discussion and negotiation, through everyone participating and listening to each other (respondent C).

On a totally opposite line of thought, respondent F asserts that all companies should be present and participate to the initial phase of rules-establishment, and rules should subsequently be accepted by all of them.

Role of sanctions

In regard to this topic, respondents were asked to decide on what policy to apply against a company misbehaving in the project and breaking the rules commonly agreed upon; afterwards, we tried to extrapolate the possible role of sanctions within this context and their nature.

“The punishment needs to fit the crime”, is the very first phrase cited by respondent A, trying to outline the nature and heaviness of a sanction towards an infringer. Following his statement, “you cannot punish someone for not delivering the expected results the first time or making a mistake, but if it happens again then you have to consider understanding why it happens” (respondent A).

Respondent B is certain about the fact that a breach in the contractual agreement would necessarily result in a negative consequence. More in depth, he points out how breaking the agreement would result in a juridical process and in being “blacklisted” in the business arena, which may be “the worst punishment you can ever get” (respondent B).

Respondent C is mainly concerned with the role of an expert within this context, but he is also firm on the application of punishments and sanctions in case of infringement by a company. However, the focus is one more time brought on the grade of the breach, which has to match the related penalty.

The use of sanctions should be one of the rules defined in the launch phase of the project, respondent F declares, and it should follow the so called “step system”; this method, essentially, “consists of an initial warning, but if you do break the rule again, then you are kicked out” (respondent G).

The situation and context where the breach of the contractual agreement takes place is fundamental to decide on the tied consequence (respondent E); following his words, “from the beginning rules should be clear and be applied very strictly, zero tolerance”. The punishment, nevertheless, has to depend on the severity of the breach, respondent E concludes.

Following a different path, respondent D is not convinced about the usefulness of sanctions, and would preferably opt for “showing the benefits of the project. Sanctions would be costly for all parties. It has to do with trust. If you use sanctions you destroy trust”.

Conflict-resolution tools

The purpose of the investigation was to understand how minor conflicts and misunderstandings between organizations within the Sandbox Model should be optimally handled and solved; followingly, the potential usefulness of a common arena where to face conflicts was tested against the interviewees’ beliefs.

Respondent E relies on the clarity and role of a common purpose and goal shared between the organizations, which should prevent conflicts from arising. In spite of this, he would opt to involve only the organizations which caused the misunderstanding, solving the problem “at the level where it

appears”; if no solution is found, then “there would be the need to use an escalation system in which the problem is taken to a superior level. Lastly, we should rely on a third party to rule it”.

Following a close line of reasoning, respondent A states how “in an ideal world, the core initiative would have a shared purpose, and this should help companies not to misunderstand each other but collaborate smoothly”. Despite this, a “mediator” should take responsibility of the conflicts, basing his decisions on the common goal; when having to clarify about the mediator, respondent A affirms how all companies should participate the resolution of the conflict.

The nature of the conflict is a remarkable feature for respondent G, since small fights would be handled by “a sort of project leader”, whereas big fights might require punishments and lead to a possible exclusion from the model.

Respondent B would “lift the question on a table, maybe using the cross-team you were talking about before”, as would do respondent D, through the adoption of regular meetings with all participants. Moreover, respondent D would pay close attention to the acknowledgment that facing problems and mistakes is something unavoidable.

Respondent C puts even more emphasis on the need to have a transparent and impartial group to decide on it; this group of trustees “may also come from the companies involved in the project, but it has to stay impartial”.

Concerning the role of a formal arena, participants were in agreement with the use and possible need of that, even though it was not the main subject of their spontaneous and first-thought answers, and solely respondent F was underscoring the potential great need of it.

Role of government

This investigation is meant to help us understand how the government is perceived by the companies interviewed when having to create rules for the Sandbox Model, and whether it may turn into an obstacle to the freedom of the initiative.

The overall line of thought with respect to this factor is uniform and recurring, and it mainly interprets the role of the government as an “helper” (respondent G); moreover, the government cannot be “an obstacle, as long as the Sandbox Model is not intended to go against the law” (respondent C).

Respondent B explains how “someone needs to have the last word, and that is when the government comes into play”. Lastly, respondent A puts more emphasis on the function of the government as someone who “helps you to open the doors. It just supports initiative”.

5. ANALYSIS

This chapter will examine and analyze the empirical findings, compare them between each other, taking into consideration the theoretical background, main guide of this project. The pivotal purpose is to bring together the focal theory illustrated within this work and the relevant findings generated through the semi-structured interviews to answer the research question of this thesis.

In the first section of this chapter, each factor will be considered separately and the results of the analysis will be explained, still following the theoretical model drawn in chapter two.

In the second section the analysis will slightly detach from each main area or sub-topic studied, to embrace a broader view of the findings, leading to new conclusions and explanations found to be relevant within the purpose of this work. This, in turn, will add new features to be considered when answering the research question.

5.1 Critical factors to encourage the Alarm and Security companies to join the Sandbox Model

The analysis within this paragraph will start by highlighting the results of the analysis upon the factors tied to the role of trust-related issues; subsequently, the analysis will move to the role played by the main features linked to the organizational and structural characteristics of a common-pool system.

5.1.1 Trust-related factors

Reputation of participants (propensity to trust)

This factor can be identified as a complex one, being it composed of two sub-areas, namely the reputation of participants and the propensity to trust, to be closely interconnected. Indeed, the propensity to trust is described by Mayer et al. (1995) as the overall willingness to trust another party, without currently having any information about that party's past behaviors. As a consequence, a higher degree of propensity to trust should push organizations to take up new collaborations without seeking a great amount of information about potential partners. More deeply, propensity to trust is dependent upon many factors affecting a single organization, such as past experiences, cultural environment or norms (Mayer et al., 1995). On the other side, Ostrom (2009) identifies the reputation of potential participants as a key feature

to be assessed when a player has to decide whether to join or not a collaboration; this is explained by the need to collect information about the trustworthiness of a player and the overall level of risk (Ostrom, 2009).

Bringing everything together, a high level or propensity to trust should be linked to a lesser degree of importance of reputation about a potential partner.

When having to ponder over a potential collaboration project and the partners involved, each respondent declares the relevance of the reputation of new partners, being labelled as “crucially important” (respondent D). As a matter of fact, each of the interviewee would seek for information regarding the potential collaborators and try to infer its reputation as well as further information. Therefore, the findings appear to in line with the theory highlighted by Ostrom (2009), and the “reputation of participants” do play a fundamental role when evaluating a collaboration proposal and related partners. On the other side of the coin, “propensity to trust” is not a factor found out to be relevant as well as present in the empirical findings, in view of the fact that each interviewee would try to gather some information regarding the potential partner, not being so prone to dive into unknown contexts and avoid the collection of useful data about those organizations.

However, the search for information regarding past actions of the companies involved in the project presents different nuances, as the findings show, not being only related to the assessment of a potential partner as trustworthy or as former user of “reciprocity” (Ostrom, 2009). Delving more in depth, Respondent A states how the tightness of the future collaboration is a key factor and a tighter relation would end up in a greater need for information. Respondent E is mainly interested in the context of the collaboration’s evaluation, given the importance attributed to the potential supplier by his company which looks for customer-driven partners. Respondent B points out various factor explaining why reputation and a satisfying amount of information would be needed about a potential partner, highlighting the role of being trustworthy, having been in the market for a considerable amount of time, and presenting a certain size in terms of revenues. Lastly, respondent C posits how trust is not created through the knowledge of past experiences of potential partners, and it might serve solely as a prompt to initiate a collaboration.

Thus, the need for information about potential partners is not uniquely sought for assessing whether to trust an organization or label it as a good reciprocator, but is part of a broader perspective which includes the search for various factors. All of them, in turn, will determine the likelihood of joining a collaboration proposal, at the end of the evaluation.

Reciprocity

The main rationale behind the theory of reciprocity asserts that when individuals perceive that others are behaving cooperatively, the former will be moved by feelings as honor, altruism and be more willing to contribute, in return, to the common cause (Kahan, 2003). The main point to pay attention to is, therefore, the likelihood of a company to contribute when other organizations are collaborating properly and, by and large, mimic the patterns of behavior of participants in the group. Similarly, when an individual witnesses another one not cooperating as expected, this would result in a non-cooperative behavior by the former player. The role of reciprocity has also been borrowed by Ostrom (2007) as one of the main features in her model about the core relationships between predetermined factors affecting the levels of cooperation in a social dilemma game. Indeed, the mere belief that a player would reciprocate the effort and contribution of another player would result in the latter individual being more likelihood to contribute and participate to the common cause, feeling the need to match the contributions of other players (Ostrom, 2007).

Interestingly enough, the main concept of reciprocity has found different shades and exceptions within the results of this thesis.

To begin with, each respondent asserts that a cooperative as well as a non-cooperative behavior by a company in the Sandbox Model would certainly have an impact on the contribution of their companies. In light of this, two respondents would follow the pattern of behavior showed by companies in the groups; consequently, an over-delivery by an organization would affect the contribution of these companies, leading them to contribute more. On the same line of reasoning, an incorrect behavior would affect the behavior of other companies negatively, pushing them to reduce the level of cooperation. Respondent B puts major emphasis on the effect on trust of an unfitting comportment by one participant, damaging the trust among the various organizations, and rendering them more suspicious in future collaborations. These explanations are finely matching the theoretical basis aforementioned, letting the main statements of the theory of reciprocity to emerge.

In spite of this, other respondents adopted a different perspective concerning this context. Indeed, respondent A, in case of misconduct by one participant, would not stop contributing or collaborating less, but he would rather try to understand the reason of the wrong behavior and solve this issue. Respondent G, besides, would be less severe in case many organizations were present in the Sandbox Model and a

few would not contribute properly, declaring this occurrence as quite probable and submissively dealing with that. Differently, in the scenario in which a few companies were participating within the Sandbox Model, his reaction to an erroneous contribution would lead to a lesser degree of collaboration and contribution in return.

In case of over-contribution, respondent C carefully underscores how companies have limited resources and they compute, in advance, how much effort and contribution they can provide to the common cause, and subsequently it is far from sure that they would mimic an over-contributing conduct. Respondent A would be mainly interested in understanding whether the extra amount of contribution by some companies could be useful to the common goal; thus, in case of positive answer to that, he believes the whole policy and scheme of contribution should be revised for all the companies involved, creating a new standard.

Upon reflection over these last features and points of view by the respondents, it emerges how the theory of reciprocity does not find a smooth application. As a matter of fact, the attitude showed by some respondents is not directed towards a matching with the pattern of contribution of other companies, but it assumes different pathways. Considering this, the rationale showed by Kahan (2003) is partially found in the words and likely behavior of some respondents, but at the same time it is contradicted by the different possible behaviors of other respondents; resource-related constraints, pre-conceived expectations and a careful evaluation of the context in which an over or under-contribution occurs become the main determinants of the response by the companies in question. In this latter scenario, the level of contribution of a company is not the point of reference of other companies' contributions, but it is, instead, the main trigger of a pondered response to that.

Past experiences

Ostrom (2009) explains how individuals resort to past experiences and their outcomes when having to decide upon a risky situation and choosing to act as a cooperator. In her statement, positive former experiences of collaboration would move an organization towards a more inclined attitude in joining new ones; oppositely, negative experiences would render an individual more cautious in being involved in collaborative situation without any warranty or incentive (Ostrom, 2009).

With respect to this area of investigation, Ostrom's main idea and concept give the idea to be noticeably matched with the findings attained through the semi-structured interviews. In fact, all the respondents showed and talked about the relevance and influence of past experiences of collaboration on deciding whether to take new ones. Respondent A affirms how experiences will shape the future policies of his company as well as future collaborations.

The model described by Ostrom (2009) is principally focused on the role of trust among individuals and sub-factors affecting the development of it, and negative past experiences of collaborations are identified as one factor hindering the smooth creation of trust among participants of a common project. In regard to this theoretical shade, respondent B is reinforcing this concept by focusing on the effect of bad experiences on the trust between different companies, which would be broken, consequently leading to a more cautious and conservative attitude next time you have to ponder over a collaboration proposal, regardless of which partner.

Hence, the nice link between theory and empirical evidences further strengthen the theoretical and practical relevance of the role of past experiences of collaboration on the willingness to trust new or old partners and be involved in new ones.

5.1.2 Organizational and structural factors

Number of participants and group composition

The optimal and fairest number of participants in a collective group is a controversial and critical factor, which witnesses different perspectives and conflicting ideas between scholars. As mentioned in chapter two, Olson (1965), our main theoretical source in regard to this area, clearly asserts how a lesser number of companies would have a greater chance to succeed in achieving a successful collective action; this, in turn, should be linked to the increasing difficulties and costs in coordinating a larger number of organizations, the ever-smaller amount of benefits accruing to each company as well as the more relevant troubles in spotting possible infringers (Olson, 1965). Concerning the communication and coordination cost-related issues, Flanagan et al. (2005) shows how new technologies and means of communications are consistently decreasing the effect of these costs on companies.

Agrawal (2000), conversely, is slightly in disagreement with Olson's statement, positing that group of participants too small would not necessarily outperform large ones, in view of the fact that small groups might have troubles finding the required resources.

As showed by the theory, also all the respondents are presenting conflicting ideas on the most suitable number of companies to be involved in a project like the Sandbox Model. Respondent A would opt for a limited and small number of companies, following Olson's ideas, to smooth and accelerate the implementation of the project. Respondent G, building upon the same main idea, would start with a small number of organizations, remarking how a greater number would hamper the coordination activities and increase the costs linked to that. Thus, Olson's main concepts are found within these two responses.

Conversely to what just posited, some other respondents would opt for a larger group, especially tied to the very nature of the Sandbox Model, which is collecting Big Data and insightfully cross-analyze them. Respondent E is the main proponent of this line of thought, followed by respondent B that puts emphasis on the contributions coming from different angles. This trend is strictly tied to the typology of good to be shared, namely data, which are by definition a non-subtractable item; this, in turn, would incentivize a greater number of companies to join the project, since the amount of potential benefits accruing to each company is independent of other companies' consumption, as stated by Oliver et al. (1993). Besides, the more individual and the bigger the amount of resources coming from them.

Remarkably, though, most of the interviewees, irrespective of the number of companies initially involved, would be willing to have the number to grow if that ended up being necessary to ensure the project to properly function; the main reason behind this, as explained by the respondents, is that you may not know in advance the most apt number of companies needed as well as new and different resources that might be needed. This last feature, thus, is opportunely fitting within the idea behind Agrawal's argument (2000), that is to say, the possible difficulty of small groups to attain all the required resources.

Heterogeneity of participants can also have an impact on the outcome of a collective action. According to Olson (1965), individuals bearing a great interest in the provision of the pursued common goal would devote more resources and energy to the actual attainment of it. Following this reason, participant F points out how it would be desirable to have the project led by a few large companies with great knowledge and resources to provide.

Ostrom (2009), oppositely, shows the downsides of having different actors, mainly tied to the increase of transaction costs, need to coordinate different actors and creating an equal distribution of costs and gains. However, respondents are mainly interested in the underlying purpose of the Sandbox Model, and

agreed on the usefulness and desirability of having companies coming from different sectors. The role of costs and related issues are not the main points of discussion analyzed by respondents.

To conclude, the optimal number of companies to be involved within the Sandbox Model is still a controversial issue. Partly, the statement of Olson concerning the preference towards having a lesser number of organizations is witnessed by some respondents. On the other side, some others express a clear preference for having a greater number of participants, chiefly for the need of collecting different perspectives and a huge amount of data, and to obtain the necessary resources to have the project working, as proposed by Agrawal (2000).

In terms of group composition, the main preoccupation of the respondents is to have companies coming from different sectors and benefitting from the disparate typologies of data; no attention is paid to the possible costs and difficulties arising when having to deal with different actors, as showed by Ostrom (2009).

Role of incentives

The role of incentives within the collective action is meant to find a way to incentivize companies to stay committed to the common purpose and stick to the rules agreed upon. Incentives, for the purpose of this work, have been mainly referred to as “positive” ones, given that an incentive can also be labelled as “negative”; a negative incentive, indeed, can be thought of as a punishment for a company misbehaving, but this section will be discussed about when talking about the “role of sanctions”.

The role of incentives is debated by Oliver (1980), showing how incentives do not necessarily have to be of economic or financial nature. In fact, appealing incentives can be tied to personal values, material prizes different from money, psychological as well as emotional ones.

As showed by the findings, and after opportune reflections and analysis upon them, the role of incentives and their nature widely vary across respondents. Financial incentives, however, are not the main ones which are referred to by the interviewees; even so, particular emphasis is put over financial incentives by respondent F and E, who consider desirable and advantageous this typology of inducements.

On an opposite note, the rest of respondents is principally interested in incentives having a diverse nature, mostly tied to the value that can be extracted from the collaboration (respondent C and D), and engaging companies' members to the directing board of the Sandbox Model, increasing the responsibility of those

members. Furthermore, respondent A would pay particular attention to keep the organizations focused on the shared goal, which should act as the main instrument to incentivize companies within the project. After having had this discussion, incentives do play a role according to the respondents, tracing what Oliver (1980) affirms in his theoretical proposition. Besides, the role of financial incentives is not as predominant as expectable; in fact, the focus on the shared purpose, the value, not necessarily financial, that can be achieved, and other managerial techniques are the main points when devising a method to keep companies motivated and reliable.

Definition of rules

In her model about the design principles linked to long-enduring common-pool resource institutions, Ostrom (1990) explains that to achieve a successful outcome it would be necessary to let the individuals involved to define and contribute to the initial set of rules of the common-pool institution, and afterwards to have the chance to modify, remove or add new rules and regulations to better fit the possibly new needs arising.

With respect to Ostrom's position, the findings partially follow her statement, diverting in regard to another feature. Indeed, none of the respondent, but one, would be willing and inclined to participate to the initial definition of rules within the Sandbox Model. These respondents, instead, would certainly prefer to have a pre-defined set of rules to lean on in the initial phase of the project. Respondent B identifies the role of a "project leader" to establish this set of rules at the outset of the initiative. On a different note, respondent C would rely on the contribution of an expert for the formulation of the rules, underlining the need for transparency and openness.

The second common feature among all the respondents, this time in agreement with what Ostrom asserts, is the preference for having the chance to modify, discuss and interpret collectively rules overtime. This characteristic is determined by the fact that the definition of rules is a "learning process where you learn and adapt the rules to the new needs along the way" (respondent B); moreover, the interpretation of rules is a critical factor of this phase, and should be conducted with all the organization together, discussing and eventually agreeing upon them (respondent E and C).

Communication method and role of a cross-team

To help organizations to create a basis on which to build trust and improve communication as well as foster cooperation, Inkpen and Tsang (2005) present the possible usefulness of a stable and fixed pool of project team members coming from the different organizations. This cross-team should allow for continuous communication and feedback among the members, helping them to better know each other and create a smooth working environment.

The issue of effective communication between partners to foster cooperation seems no longer one of the main concerns within companies, according to the respondents' words. As a matter of fact, respondent B in tandem with respondent C highlight this point, putting emphasis on the use of classic as well as new means of communication which are currently working properly and effectively. The development of digital tools, the uninterrupted flow of information available at each point in time and the classic meetings seem to be significantly facing the communication and coordination issue.

As a direct consequence of this, the usefulness and role of a cross-team is not the first tool respondents would rely on, contrasting the theoretical approach proposed by Inkpen and Tsang. Most of the respondents were confirming the positive features of a cross-team, such as the possibility to inform every organization about everyone's needs and voices (respondent A), or the chance to share each company's ideas and visions (respondent E); however, in spite of that, all respondents, exception for one, were not in agreement with a prolonged use of a cross-team as a way to improve communication, foster collaboration and eventually build trust. A cross-team is seen as a possibly great solution at the inception of the project, when companies need a closer communication to create the basis of the relationship (respondent E and C), but, over time, the trade-off between quality, ensured by a cross-team, and speed, a disadvantage of a cross-team, would render it less appealing to organizations (respondent A) and to some extent cumbersome.

Consequently, the concept of a stable group of project team members coming from the organizations involved finds a desirable application only in the initial phase of a project, when organizations need to put great effort to communicate and coordinate, and it becomes needless over time, due to the classic as well as new means of communication and coordination, presented as effective and well-performing. This last feature, moreover, is apparently reducing the challenge present in organizations about communication and coordination matters.

Role of sanctions

In the occurrence in which a participant is found to be infringing a rule of the contract of the common-pool resource institution, Ostrom (1990) is concerned with the likely application of a sanction, either as a deterrent and as a punishment. One of the main features of the probable sanction is being “graduated”, by which it is meant that the heaviness and seriousness of the punishment will initially be low, to increase overtime in case the infringer would keep on misbehaving.

In regard to the use of sanction, all the respondents, except for one, are undeniably on the same page about the application of a strict and rigorous scheme of sanctions. One of main preoccupations of respondents, moreover, is the nature and degree of the sanction. Indeed, a common thought is that the sanction has to be initially moderate, not being reasonable to punish too heavily the infringer the first time a mistake is committed (respondent A, C and G). Thus, the main concept in terms of graduated sanctions, explained by Ostrom (1990), is found to be present and well-described, and so it is the need perceived by the respondents to rely on sanctions so to have participants sticking to rules. More generally, plus, the sanction has to “fit the crime” (respondent A), using common sense when applying them and relating the punishment to the severity of the contractual breach.

One exception is recounted by respondent D, who would rather prefer to show the benefits of the project than imposing sanctions, asserting how this would be costly to all participants, particularly in terms of trust. This feature, besides, is remarked by Oliver (1980), who explains how punishments might be costly in view of the fact that actors undergoing them may react negatively, seeking for revenge, feeling frustration and consequently hindering the opportune continuation of a collaborative behavior.

Respondent B shows another feature highlighted by Ostrom (1990), namely the additional and non-financial effects imposed by a punishment, such as loss of status and credibility; in fact, “being blacklisted in the business arena”, respondent B explains, “can be the worst punishment you can ever get”.

Ending this reflection, the empirical evidences and the theoretical concepts showed by Ostrom (1990) behind the use of graduated sanctions and their related issues are handily overlapping, showing, inter alia, a high degree of homogeneity among the answers of the respondents. One fact diverting from Ostrom’s idea, however, concerns the individual in charge of the application of the sanctions; whereas Ostrom points out the participants themselves to be in charge of that, respondent C indicates an external expert supposed to be responsible.

Conflict-resolution tools

One of the main features of Ostrom's model about long-enduring common-pool resource institutions (1990) is the presence and role of a mechanism where participants have the chance to discuss and solve minor issues, mainly due to misunderstandings and inter-organizational conflicts. Using Ostrom's terminology, the function of a formal arena would accomplish this task, helping organizations to proceed with the pursuit of the common goal in spite of these minor setbacks.

The need of a mechanism to solve minor conflicts and misunderstanding is a touchy topic for the respondents, and their answers witness their favorite ways to handle them. The common goal and the shared vision inherent to the Sandbox Model should, above all, help companies not to create conflicts and work agreeably together (respondent A and E). Nonetheless, where conflicts and misunderstandings arise, different methods to face them are presented. From the role of a transparent and impartial group to decide upon the conflict, passing through a "sort of project leader" (respondent G) to rule the issue, to an escalation system, where tough problems are lifted to superior levels within the chain of command of the Sandbox Model. Interestingly, respondent F would, once again, rely on punishments and sanctions in case of big conflicts which resulted hard to be solved.

Therefore, as Ostrom (1990) points out, there is a remarkable need for mechanisms and tools to face and solve minor conflicts and misunderstandings arising between the organizations involved in the common project. Besides, these tools vary expressively among each other, whilst the role of a formal arena in itself is accepted by the respondents as potentially useful, but it is not the primary resolution tool devised.

Role of government

When formulating the main rules and regulations of a common-pool resource institution, Ostrom (1990) refers to the role of government as a possible concern when it becomes too intrusive and constrictive in regard to the freedom given to participants to devise their own and best fitting rules. Thus, the role of government may end up being an issue rather than an ally.

In spite of Ostrom's concerns about the potential negative impact of the role of government agencies on a common initiative, all respondents are unwaveringly on an opposite line of thought when facing this topic. That is, respondents do not perceive the government as a possible obstacle or major issue, and

label it as “someone that helps you to open the door” (respondent A) and, more simply, as “a helper” (respondent G). As long as the Sandbox Model does not pursue illegal or unlawful goals, the government cannot be an obstacle, states respondent C on a seemingly ironic note.

Hence, Ostrom’s worries are not found to be relevant within the context of the Sandbox Model and according to the respondents’ clear ideas, relying on the government as a supporter of the initiative.

5.2 Further analysis and insights

In this section we will present further insights derived from the analysis of the findings in order to add other relevant perspectives and features which might be of interest when answering the research question of this work and within the context of the Sandbox Model as a collective action.

Throughout the interviews conducted over the six respondents, irrespective of the specific sub-topic which was guiding the data gathering, the notion of “sharing” was repeatedly present and linked to different aspects. Respondents have been asked about their definition of trust, about some possible factors that might hinder the creation of trust and some others that could work towards the enhancing of trust among partners. Plus, they have encountered other topics which were approaching themes such as how a partnership is evaluated and how to motivate partners. A common denominator was the presence and emphasis put on the need to “share” a common feature and understanding of something.

More in depth, having a common goal and purpose resulted to be a prominent feature when dealing with the definition as well as enhancing of trust among partners working within the same project. This, moreover, seems to be a discriminant when partners have to evaluate a collaboration proposal. As a matter of fact, among the disparate factors to be taken into account, assessing whether the potential partners as well as the main project hold a common goal and understanding of the purpose, idea and vision, turn out to be a recurring concept explained by the respondents.

Sharing a common goal, at least according to Ostrom (2002), may also contribute to reduce the friction between heterogeneous companies, and this could explain why respondents were mainly interested in finding partners sharing a common goal, regardless of the very nature or sector the company belongs to. The sharing of a “common feature” is also encountered in relation to having a shared language, value and ethics. This, more specifically, is linked to a twofold outcome; indeed, sharing the highlighted features would enhance the partnership and act as an actual incentive to motivate organizations to stay

committed to the project and the common cause. Secondly, working and operating on the same page is seen by most respondents as a way to avoid the arise of misunderstandings and minor conflicts.

In light of this, the notion of sharing and having a common purpose, goal, vision as well as values is predominant and prominent in regard to various areas of main interest within the Sandbox Model, especially to ensure an effective implementation of the project, the right incentive for companies to embrace the project and the development of a strong basis of trust and common understanding to smooth the collaboration.

In order to create and favor the development of trust between the organizations involved in the Sandbox Model, a second noteworthy characteristic is the predisposition of companies towards being open to discuss and communicate between each other and share information. In fact, trust seems to be developed more effectively in contexts in which individuals are free and inclined to share information and rely on a continuous dialogue, stating the main concepts underscored by the respondents.

Particular emphasis is put on the role of consistent dialogue, which not only works as trust enhancer, but covers also other valuable aspects. That is to say, being open and relying on a constant dialogue is found out to be helpful when facing misunderstandings, in that it would facilitate the solution of the conflict as well as act to prevent them from happening.

Lastly, dialogue and open communication are defined as a nice helper when having to define and interpret rules and regulations of the common project. This is tied to the fact that it allows a better understanding of each other's needs and ideas, enhance a proactive and productive discussion and, eventually, foster the achievement of a common interpretation of the rules to, finally, agree upon.

Therefore, companies inclined to count on an open and continuous dialogue and communication are seen as a relevant and strongly suggested characteristic, given that it would help the main organization to achieve important outcomes, such as a smoother resolution of conflicts, better interpretation of rules and, more importantly, the development of trust among the companies involved. This latter feature is nicely encountered in Poppo et al.'s proposition (2008), where trust is defined as an incremental and progressive process, where frequent interaction and open communication will eventually lead to the effective creation of a strong basis of trust in the common organization.

During the interviews, some possible reasons that may hinder the creation of trust and also destroy it came out. One common line of thought among the respondents with respect to this is concerning the excessive focus of companies on individualistic and personal goals. To elaborate on this proposition,

respondents are underlining episodes such as “stealing data, not sharing or using data for its own business” (respondent B) as well as “focusing too much on personal achievements and losing sight of the common goal” (respondent E). Alongside with those explanations, a following concern is about having some companies to obtain gains while other ones do not. This flow of reasons illustrates the selfish nature of some individuals and companies which may be detrimental to the creation of a basis of trust among companies. Interestingly, on a side note, respondent E explains how in big organizations people tend to be more individualistic and self-centered than in smaller ones, and they are prone to protect themselves, losing sight of the main goal and underlying common cause they are working for.

Plus, these features stand in opposition to the ones discussed in the first paragraph about the role of a shared and common goal between companies to create trust. Indeed, an excessive focus on individualistic objectives is completely opposed to the working towards the common goal and the achievement of the shared cause. It seems reasonable, thus, that not taking into account the shared purpose of the project and working to attain it might end up as a major obstacle in creating trust. Conversely, as stated previously, working while having in mind the common goal may heavily contribute to the foundation of a trust basis between companies.

Across the interviews, respondents were asked to describe how they evaluate and decide upon a collaboration proposal. From one side, as described in the last paragraph, a focus on a disproportionately egoistical and individualistic goal would end up harming the creation of trust. On the other side, nevertheless, companies do look for potential benefits and gains to draw from the collaboration, and this egoistical and selfish perspective is seen as acceptable and remarkably important by respondents. As a matter of fact, when having to weigh a new collaboration or partnership, the chance to learn and to get a reasonable profit from it are ones of the most prominent points in the assessment process. Besides, and on a more general and broader perspective, a great deal of relevance is attributed to the possible value that can be extracted from the common project, where value is not defined as financial one, but it lies on a wider meaning. To use an answer from a respondent which results to be self-explanatory of this concept, during the evaluation of a collaboration proposal, primary attention is paid to “what it is in for us” as a company (respondent B).

Tied to this fact, companies need to find a fair balance between an egoistical and individualistic pursuit of a personal goal, and the focus on the achievement of the common and shared goal. Working towards the attainment of one’s own objectives is considered acceptable and desirable, as long as part of the focus

is still centered upon the realization and pursuit of the common goal, which is the reason why the whole common organization has been given birth to.

6. CONCLUSIONS

6.1 Conclusions

Nowadays, the way to compete and work is witnessing a radical shift from competition and self-reliant working environments to co-opetition and collaborations, where leaders, organizations, politicians are recognizing the ever-complex scenarios in which they found themselves operating (Hecht, 2013). As a result of this paradigm-shift, new forms of cooperation, partnerships and collaborative agreements are taking place and acquiring new shapes, carrying with them all the complexities and multifaceted features linked with their actual and successful implementation (Phillips et al., 2000).

Within this rapidly changing environment, the Sandbox Model is nicely placed, and some issues are arising to be worked and reflected upon. The Sandbox Model is a project currently undertaken by the Swedish Fire Protection Agency, and it derives from the increasing importance and applicability of Big Data, described as a considerable amount of data in structured or unstructured fashion, collected as a consistent flow and leading to intuitions and insights thanks to an accurate analysis (The Economist, 2017). More in depth, the Sandbox Model can be described as a common recipient of Big Data, coming from different stakeholders involved in the project, for the purpose of gaining insights and other benefits from the cross-analysis of the considerable amount of diversified data. The primary purpose of SBF, however, is to tackle a social issue, namely the avoidance of fires, prevention of them and the reduction of people and objects affected by fires. This outcome, moreover, would come from the everyday analysis of the continuous stream of data derived from the different companies and sectors within the project and the shared Big Data collector.

In order to implement the Sandbox Model, one of the first steps is to convince companies to be willing to share their Big Data and join the common project as well as the underlying goal. This, in turn, becomes the starting point of this work, where the objective is to try to understand which factors can work to persuade and incentivize companies to embrace the Sandbox Model, given the peculiar features of this project. In the specific case of this work, the focus is on companies belonging to the Alarm and Security Industry, labelled as one the sectors of interest. The particular aim of this work finds a comfortable

application within the context of the *collective action*, theoretical stream which puts emphasis on the outcomes of the actions taken by two or more people in the pursuit of the same collective good and the related issues (Marwell and Oliver, 1993); moreover, as Ostrom (2009) further states, a collective action problem is found each time an individual has to decide upon which step to take in an interdependent situation, such as pondering whether to participate and contribute to the common project or not. This theoretical framework, with its various features, is the backbone of the work.

Delving into it a bit deeper, among the many and disparate features linked to the attainment and possible outcomes of a collective action, two main areas have been identified as most relevant to the purpose of this thesis; firstly, the role of trust-related factors in collective actions as a way to foster collaboration and cooperation and ensure a smooth implementation of a common project. Followingly, the role of some organizational and structural features of the common organization linked with successful collective actions, which are supposed to effectively entice individuals to join a collaborative framework and work towards the shared goal.

This rich and complex theoretical basis has led to the formulation of the main research question of this work, and its sub-questions, necessary to thoroughly and more accurately provide an answer to the main question. To state them again:

Main research question:

- ❖ *What are the most critical factors in encouraging the Alarm and Security companies to share their Big Data in the pursuit of a collective action?*

Sub-research question 1:

- ❖ *What is the role of trust-related factors according to the Alarm and Security companies?*

Sub-research question 2:

- ❖ *What is the role of relevant organizational and structural factors of the common-pool resource institution, drawn from the literature review, in the eyes of the Alarm and Security companies?*

In order to come up with a satisfying answer to those questions, this work is developed from a qualitative study focused on a multiple-case context. The main reason to use this method of investigation is tied to the great degree of flexibility provided by a qualitative study and the application of a semi-structured interview, in tandem with the particular theoretical framework of this work. Indeed, the great and detailed theoretical backbone of this thesis is used as a reliable and thorough guide to help us explore the main issues, hence having a clear path in mind to follow. Having the chance to count on a solid and well determined areas of focus, the respondents have been given the chance to navigate through those topics and letting their point of view to emerge, be it strictly tied to the area of interest or diverting from it. The main goal of our investigation, as a matter of fact, is to capture the thought, opinions and explanations of the participants of the empirical phase to provide an insightful answer to the aforementioned research questions. However, the main topics and areas explored within this work were not thought to narrow the area of research or to constrain the freedom of interviewees in providing an answer. Conversely, they served as a way to increase the understanding of each factor, either for the respondents and the reader, and to find a tidy fashion to contribute to the purpose of this work without losing focus on the pivotal concern. A multiple-case study, besides, has been used so to increase the comparability of the findings, to more accurately analyze the data and extract insights, and to try to render the work more reliable and trustworthy, counting on the contribution of more interviewees and their point of view on the question of interest.

When showing the empirical findings and accomplishing the main research goal of this thesis, I find useful and more opportune to separately address the two sub-research questions, which, combined together, will provide the answer to the main research question.

Sub-research question 1:

❖ *What is the role of trust-related factors according to the Alarm and Security companies?*

Investigating this topic has resulted to be interesting as well as intricate, being trust a factor which involves many more ones in itself. Interestingly and strictly tied to the main characteristic of a partnership, trust seems to be developed more effectively when potential participants share a common goal and work towards the achievement of a shared purpose, which ensures a smooth implementation of the project. Besides, in order to foster the creation of trust among partners, a prominent feature turns out to be the attitude of companies in the direction of open dialogue and constant communication, as well as

to share information between each other. Indeed, this would allow the correct development of the relationship through discussions, idea sharing and continuous communication to solve minor conflicts and get to know each other better over time.

To create a basis where to build trust, moreover, potential participants would look for information regarding other companies in the common project, using this method not only to accomplish trust-related issues, but also to obtain other relevant information to opportunely ponder over a collaboration.

According to the findings, trust is not particularly involved in the theory of reciprocity, where witnessing or trusting that a company will reciprocate the efforts of other companies will lead to higher levels of cooperation and contribution (Ostrom, 2007). In fact, resource-related constraints, ingrained expectations or a detached analysis of the context in which an over or under-contribution takes place will guide the response of a company; this, however, is not necessarily matching with the contribution of the over or under-performing company in question, and can assume different levels, unrelated to the actual contribution of the former.

Furthermore, past experiences of collaborations of a company are showing a noteworthy relevance when companies have to evaluate whether to trust another company to form a new partnership. Indeed, good experiences would lead to a greater degree of willingness to take up new partnerships, whereas the opposite holds true in return.

On the other side, trust can also be damaged by certain behaviors, and one common feature which resulted repeatedly is linked to the scenario in which participants focus excessively on personal gains and benefits, losing sight of the common purpose and adopting selfish behaviors which contrast with the inherent goal of a common project.

Sub-research question 2:

- ❖ *What is the role of relevant organizational and structural factors of the common-pool resource institution, drawn from the literature review, in the eyes of the Alarm and Security companies?*

As a starting point, one controversial issue boils down to the most desirable number of organizations to be involved in the Sandbox Model, given its main features and purposes. Indeed, there is no uniformity and complete agreement over the most suitable number of companies for this project. Consequently, this is a feature to develop over time when companies will obtain a greater understanding of the needs of the Sandbox Model.

It is paramount to incentivize companies to stay committed and comply with the rules of the project, and financial incentives are seen as an effective tool, alongside with non-financial ones, where emphasis is principally put on the possible value that can be extracted from this collaboration. Plus, aside from other techniques, sharing a common purpose can act as a powerful tool to push companies to work towards the objective of the Sandbox Model.

In the model, the definition of rules is necessary for a proper execution of the project, but companies are not interested in the definition of the first draft of rules and regulations, whereas their role would be to work in the direction of a common understanding of these rules and the possible modification or adding of new rules. Indeed, the definition of rules is seen as a process to be refined overtime.

Communication is a relevant part of the everyday life of an organization, and many different tools and mechanisms are being developed to tackle this potential issue, which seems to be not as problematic as in old days. The expected usefulness and desirability of a cross-team within this context is not perceived as particular relevant by organizations, if not for the possibly frantic initial phase of the Sandbox Model, where more communication and coordination might be requested.

Sanctions do play a role when companies transgress, and a “zero-tolerance” policy is labelled as necessary. However, it is relevant to accurately tailor the sanction to the nature of the crime.

Conflicts and minor misunderstandings will inevitably occur during the implementation of the Sandbox Model, and formal mechanisms to face them are sought for. Besides, various possible tools are devised, showing how vast is the area in this context. Sharing a common vision and purpose is, among other factors, perceived as helpful in avoiding the burst of conflicts. Plus, continuous dialogue and open communication can further contribute to facilitate the solution of minor misunderstandings.

In evaluating a collaboration proposal, aside from sharing a common goal and purpose, companies do look for personal gains, which do not necessarily have to be found to be financially-related. The stress is chiefly on the value coming from this project, defined in a broad perspective, such as being involved in the most technologically advanced areas or learning from the partners in the collaboration.

The government, lastly, can be of great helpfulness for this project, showing the most apt pathway to go through and supporting, consequently, this initiative.

6.2 Recommendations

The recommendation part will be divided as follows: the first part will focus on suggestions and advices strictly tied to the purpose of this work, namely the successful implementation and development of the

Sandbox Model; the second part will try to draw more general and widely applicable recommendations to companies trying to work together through a partnership.

6.2.1 Recommendations for the successful implementation of the Sandbox Model

The following recommendations are based on the empirical findings and their analysis, leading to advices and suggestions on how to increase the likelihood of a successful implementation of the Sandbox Model.

- ❖ In the beginning of the project, the focus should be put on a small number of companies, possibly from different sectors. Overtime, based on the needs of the projects and the learning process, new companies might be involved.
- ❖ Leaders of the Sandbox Model should strive for creating a common goal and understanding of the main purpose between all the participants; this may be principally achieved through open dialogue and continuous communication, showing willingness to share information and data.
- ❖ The pattern of contributions of the Sandbox Model shall be clear and well-defined, where each participant has a clear image of the effort to be put into the collaboration, with no need to over-contribute or risk to under-contribute.
- ❖ In the initial phase of the model, all possible streams of overall value from the project should be showed, either financial or not, in order to entice companies to embrace the Sandbox Model. Plus, companies should be helped to understand their personal gains from the project, so to heighten the likelihood of their participation.
- ❖ In the very beginning of the project a draft of rules and regulations should be available. Based on this, companies would decide whether to join the project or not, and possible modifications or advices may be provided by companies themselves.
- ❖ A strict pattern of sanctions has to be implemented within the project, not excessively severe at first application; moreover, formal tools should be devised to face and followingly solve potential minor conflicts or misunderstandings among the companies in the project, with the chance to choose from a wide range of utilizable instruments and mechanisms.

6.2.2 General recommendations for a successful partnership between organizations

This section will revolve around more widely utilizable suggestions and thoughts on how to increase the likelihood of a successful collaboration and cooperation between companies forming a partnership. These advices, as for the previous case, are derived from the empirical investigation and its related findings, in a more general context, subtly detached from the Sandbox Model.

- ❖ A high degree of attention should be directed towards the initial number of organizations to be involved in a partnership. Indeed, initiators of the project should strive for understanding the real needs of a common project and devise a reasonable and functional number of participants. This is relevant in view of the fact that companies and their managers are still remarkably concerned with the possible difficulties and consequences of a too large group of organizations, and they seem to prefer an iterative process in which the fairest number of companies emerges overtime.
- ❖ One of the most recurring concept and, subsequently, noteworthy statement is the need to have a common goal to guide organizations in the direction of their goals. As a matter of fact, the feature of having a common goal and understanding of the common cause appears to be at the very basis of a successful collaboration. Using a proper analogy, the common goal should work as the track upon which organizations, namely the wagons of the train, are supposed to ride. That is to say, from the very beginning of a project, all the participants should put enormous effort in trying to align their goals and objectives with the ones of the underlying common project.
- ❖ Rules and regulations are a prominent feature and should be related to various areas of interest, such as the proper behavior to have in the common organization, the potential sanctions that might arise if companies would be caught infringing a rule, as well as the mechanisms and tools to be implemented in case of misunderstandings or minor conflicts. Through this well-defined and agreed upon set of rules, governing some of the most relevant topics in a common organization, companies would be sure to work together for the achievement of the common goal and would have a solid foundation to rely on in regard to critical occurrences, such as conflicts or breach in the contractual agreement. Consequently, having the certainty to know what the outcomes of certain behaviors would be, and which actions to take in specific situations, should lead organizations to be less concerned and worried about the implementation of a partnership, having a candid set of governing rules and regulations to count on.
- ❖ Even though managers of organizations seem not to be considering communication as a prominent issue in the organization's life any longer, the relevance of an open dialogue and continuous communication is still particularly high. As a matter of fact, having the chance to

count on constant communication and clearly state the organizations' ideas, visions and goals is one of the determinants of a successful partnership. The outcomes of this open and continuous dialogue are linked to the reduction of misunderstandings as well as a faster resolution of them, in tandem with a wider consequence in regard to the creation of trust, which seems to be enhanced through open and consistent communication between companies.

6.3 Future researches

As stated previously, time and resource-related constrained have limited the possible range and scope of this research. As a matter of fact, the extensive literature over this topic may lead to the identification of many different factors which would be interesting to study. This work, however, has strictly focus on a set of sub-areas and topics, highlighted in the theoretical model, and further work would be welcomed to be putting focus on other relevant features which may contribute to the purpose of this work.

Additionally, this work has mainly focused on companies belonging to the Alarm and Security Industry, being this one of the main industries to be involved. Yet, other industries have been labelled as relevant, and future works might study the behaviors of companies within other industries, such as Insurance companies or Governmental agencies.

Concerning the theoretical background utilized in this work, two main streams appeared to be of particular interest according to the findings, and would need additional studies. Firstly, the optimal number of participants to be engaged in a group for the achievement of a common goal is still a controversial and blurred topic, and its nuances are quite different based on the context in which the partnership has to be formed. Olson (1965) and Ostrom (2009) notoriously contributed to this issue, but an ultimate explanation seems still to be far from reached. Secondly, Kahan's theory of reciprocity (2003), also adopted by Ostrom (2007) for her studies on the factors affecting the levels of cooperation in a social dilemma, did not find a smooth application in this work. Subsequently, it would be interesting to dig deeper within this topic, with particular emphasis on the role of reciprocity in an organizational setting and environment, to discover new explanations and theoretical shades to understand this phenomenon.

Lastly, it would be interesting to analyze and study the Sandbox Model while up and running, further in time. In this way, other relevant insights might be found, tied to the scope of this project, and further findings would lead to rejecting or embracing the already identified explanations and theoretical features proposed.

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APPENDIXES

Appendix A. *interview guide-line*

Topic 1: *trust-related factors among organizations while collaborating on common projects*

- ❖ What is your definition of trust among different organization working together to pursue a common goal?
- ❖ According to your opinion and past experiences, which factors can turn out to be important to enhance trust among different companies working together?
- ❖ On the other side, which factors could potentially harm trust among organizations?

- ❖ What is the policy of your organization in regard to collaborating with other companies? That is, how do you evaluate a collaboration proposal?
- ❖ Have you had past experiences of collaboration with external organizations?
- ❖ When deciding whether to join a collaboration project, what is the role of past experiences of potential participants in group projects?

- ❖ Is your company currently involved in projects similar to the Sandbox one?
- ❖ In the scenario in which an organization does not collaborate and contribute properly, how this would affect your company's behavior in terms of contribution?
- ❖ Consider this scenario: your company is supposed to contribute a fictional amount of 10, and it does so. Some other organizations, supposed to contribute 10 as well, contribute more than 10. How would this impact your company's behavior in terms of contribution?

Topic 2: *organizational and structural features linked with successful collective action*

- ❖ What would be a fair and reasonable number of participants in this project? Why?

Clarification: by heterogeneity of participants it is meant the differences in terms of size, industry, market served and so on concerning the various companies in the project.

- ❖ What is your opinion about having heterogeneous companies involved in this project?

Clarification: by incentive it is meant a way (not necessarily financial) to ensure that a company behaves fairly and contribute as agreed to the project. Positive incentives can be rewards provided when a company sticks to its duty. Negative incentives can be punishments utilized when a company misbehaves and breaks a rule.

- ❖ How would you encourage all the companies in this project to stay committed and comply with the rules commonly agreed upon?
- ❖ What would be the role of incentives, mainly positive, within this context?

Clarification: by cross-team it is meant a stable and fixed pool of employees coming from the different organizations involved in the project to help them to better manage the Sandbox Model and to foster collaboration.

- ❖ Can you think of a method or system to help the companies involved in the project to better communicate and coordinate?
- ❖ Within this context, what would be the role and impact of a cross-team?

- ❖ How should the establishment of rules and regulations be undertaken in the initial phase of the project?
- ❖ In case of violation of a rule by a company in the project, what should be the policy towards the infringer?
- ❖ What would be the role of sanctions in this context?
- ❖ In case conflicts and misunderstandings among organizations arise, how should they be handled?
- ❖ What would be the role of government with respect to this project?

SUMMARY

INTRODUCTION

Background

Leaders, organizations, politicians are acknowledging that their role and efforts towards their goals are facing increasing difficulties in a world which is becoming ever-complex and articulated between a countless number of factors to take into account (Hecht, 2013). One of the possible solutions to this deep and multifaceted obstacle is to work towards the opening of the personal and organizational boundaries so to initiate a collaboration project with external partners and individuals and strive for the achievement of a shared goal. This trend, namely the creation of new collaboration projects in disparate fields and contexts, has been growing in importance over the last years (Hecht, 2013). As a first result, competing organizations are embracing the idea to form collaborative partnerships with actual and potential competitors, dramatically changing the way to do business (Entwistle and Martin, 2005).

Furthermore, cooperative relationships are becoming a mainstream tendency also between companies and organizations not directly involved in a competitive arena (Phillips et al., 2000). Collaboration, in this sense, can be defined as “a cooperative relationship among organizations that relies on neither market nor hierarchical mechanisms of control” (Phillips et al., 2000). These collaborations can take the form of joint ventures, strategic partnerships, alliances, or outsourcing, just to cite some among the many more options (Harrigan, 1985; Kanter, 1990; Winkleman, 1993).

The need to cooperate and collaborate to reach a common and shared goal is becoming increasingly relevant and, consequently, organizations must adapt to this new and more complex scenario. The gains from the mentioned new forms of relationships are of remarkable relevance, but even so, obstacles and challenges to the effective implementation of those collaborative proposals have to be faced and surmounted (Phillips et al., 2000).

Problem description and research objective

Within this new scenario pointed towards new cooperative initiatives, the role of Big Data, regardless of the field they are applied to, is attaining more attention over time, due to new possibilities and sources where to gather Big Data and the following new and potential applications of them (Chen et al., 2012). Consequently, the role of this huge amount of data, structured or unstructured and captured as an endless flow, has contributed to the creation of new infrastructure, new businesses, new monopolies, politics and new economies as well (The Economist, 2017).

Among the disparate applications and projects tied to this growing phenomenon, the Swedish Fire Protection Agency (SBF) is currently trying to implement a project called *Sandbox Model*. This initiative derives from new technologies such as Internet of Things, novel and more accurate sensors, and more importantly the ever-growing availability of Big Data. The main purpose of this model is to allow different and diverse companies, coming from different industries, to share their Big Data within a common *Big Data recipient*, namely the Sandbox. By doing so, the SBF aims at fulfilling a social purpose, that is, the avoidance of fires, prevention of them and the reduction of people and objects affected by fires. This would be attained through the cross-analysis and live-collection of different typologies of data coming from the various firms involved in the project, so to be one step ahead of the burst of a fire or to intervene in a timelier fashion.

Furthermore, SBF is trying to engage companies from mainly three domains: Government agencies, Insurance companies and Alarm and Security companies. To implement this initiative, however, it is needed the actual creation of the Sandbox structure and organization, as well as the participation of the various stakeholders in the first place.

Companies belonging to the Alarm and Security Industry have been labelled as ones of interest, and consequently it is needed to engage them and convince them to embrace the project. The actual engaging of these companies, nevertheless, will constitute the main problem to address within this work, leading us to the definition of the research objective. One of the most prominent feature concerning the Sandbox Model is that it entails the formation of an inter-organizational relationship between more stakeholders, either ones competing between each other and not. Followingly, the main purpose of this work is to find what are the main and most critical factors in encouraging companies belonging to the Alarm and Security sector to be willing to join this project and share their Big Data. Differently phrased, the goal of this thesis is to show which factors can work as incentives and their role in regard of the companies of interest and which ones, as a logical consequence, could turn out to be hindering the pursuit of the

Sandbox Model. In so doing, the Sandbox Model nicely fits within the notorious theory of *Collective Action*, subject of study of scholars such as Marcus Olson and the noble prize awarded Elinor Ostrom.

With the goal in mind to find which factors can work as incentives to allow companies from the Alarm and Security industry to get onboard the Sandbox Model, and building on the main theoretical background identified as prominent in regard to this, we can state our main research question:

- ❖ *What are the most critical factors in encouraging the Alarm and Security companies to share their Big Data in the pursuit of a collective action?*

To better answer this main research question and provide a clearer and more insightful answer, two more sub-questions will be addressed:

- ❖ *What is the role of trust-related factors according to the Alarm and Security companies?*
- ❖ *What is the role of relevant organizational and structural factors of the common-pool resource institution, drawn from the literature review, in the eyes of the Alarm and Security companies?*

LITERATURE REVIEW

With respect to the literature review, the reader will be introduced to the main theoretical background upon which this work unfolds. First and foremost, the *collective action theory* will be presented, being it the backbone of the entire work, along with its most notorious features. Followingly, the reader will encounter the role played by *trust* among different actors when having to cooperate and collaborate for a common purpose, immersed in the context of a collective action. Lastly, the *common-pool resource dilemma* will come into play, as a remarkable sub-category of the broader collective action theory.

Collective action theory

The theory of *collective action* is the cornerstone on which to base this project. Indeed, all the theories that will be presented in this work will be strictly related to the main theoretical concept of collective

action. Following the statement of Marwell and Oliver (1993), collective actions are those “actions taken by two or more people in pursuit of the same collective good”. As Ostrom further pointed out (2009), a collective action problem appears when an individual has to decide which step to take in a specific interdependent situation, and the decision usually boils down to deciding whether to participate and contribute to the pursuit of a common good or purpose.

Building on this main theoretical stream, the main characteristics and features of the collective action dilemma were taken into account. First and foremost, the group size, following Olson’s statement that large groups are more inclined to fail to provide a collective good. According to Olson, in smaller groups the size of benefit accruing to each member is big enough to provide incentives to undergo the costs of providing the collective good; even further, there can be the occurrence in which a member of the collective group has an interest so strong in the provision of the good that he would be willing to bear all the cost necessary to the provision of that (Olson, 1965).

Given the unlikelihood to obtain a collective good spontaneously by the members of a group with a common interest in that good, some other viable solutions have to be found to address this concern. Olson (1965) stated how the role of incentives can work finely in this context. As a matter of fact, through the use of “selective” incentives, it would be possible to push actors to cooperate and contribute to the provision of the good. The incentive can work in a positive way, thus being a reward for a member who is working toward the group’s interest, or negative, then depicting a punishment to the misbehaving member who refuses to contribute. The most prominent feature of this typology of incentive is that they have to be *selective*, meaning that the incentives have to be precisely aimed at those actors who are not acting according to the group’s interest.

Among the researchers contributing to the collective action theories, Elinor Ostrom is undeniably in the forefront. One of her precious contributions deals with the provision of a list of structural variables that are likely to affect the successful realization of a collective action (Ostrom, 2009). Indeed, in her field works, Ostrom noticed and highlighted some of the recurring organizational characteristics among the cases she studied, eventually leading to the formulation of a well-thought-of set of variables concerning the very nature of the setting in which the collective action was supposed to occur. Ostrom identified seven structural variables, namely: the number of participants, nature of benefits, heterogeneity of

participants, linkages between participants, free entry and exit, communication mean and information about past behaviors. All the variables have been given explanation in this work.

Collective action and the role of trust

The role of trust in helping individuals to achieve positive outcomes in collective actions has been attaining great interest among scholars, and once again Elinor Ostrom places herself as one of the leaders. Indeed, the creation of trust among individuals in the context of a collective action is an essential prerequisite to the accomplishment of the common purpose (Ostrom, 2008). Additionally, if a participant believes that another participant is trustworthy and will reciprocate the contribution, the likelihood of a successful cooperation will raise as a result (Ostrom, 2008).

Besides, a collective action logically entails a close dependence of the participants on each other, and these inter-dependencies are necessary to accomplish the common goal; subsequently, since interaction, coordination and collaboration will be particularly high, a necessarily relevant level of trust will be required to ensure a smooth work between the members of the group (Mayer et al., 1995).

The amount of literature concerning the effects of trust on inter-organizational relationships is ample and consistently gaining more interest in a society in which collaboration and cooperation are the new ways of competing in the market arena. Along with that, it is possible to underscore and analyze some of the factors and characteristics of an organization's structure or of an individual's features that help trust to grow and spread through all the participants. In so doing, this work has tried to highlight some of the aspects that were most related to the topic and scope of this project, casting light on their effects on the trust felt by participants in the scenario of a collective action.

The theory behind the logic of Marcus Olson's collective action dilemma is that an individual trying to maximize her welfare will most likely choose not to contribute but to free-ride on the contributions made by other participants (Olson, 1965). The main result of this dilemma is the struggling to reach the accomplishment of the collective action. Under a different perspective, some scholars have raised a different approach to this dilemma, based on a more *emotional* individual state, that is, the logic of reciprocity (Kahan, 2003). According to this theory, and underlying the words of Kahan (2003), "when individuals perceive that others are behaving cooperatively, they are moved by honor, altruism, and like dispositions to contribute to public good even without the inducement of material incentives". The main

takeaway in this statement is that individuals would be likely to cooperate and contribute to the common cause when they perceive and see other participants doing the same, given that this occurrence would arise in them a need to contribute in return, following the steps of individuals in the group.

Ostrom (2007) devised an appealing model in regard to the role of trust and trust-related factors affecting the levels of cooperation in a social dilemma. According to the Nobel Prize awarded Ostrom, reputation of participants for having used reciprocity and being good contributor in the past within collective-action situations is certainly impactful on the decision of other actors whether to trust them and decide to cooperate. Indeed, a positive reputation about being cooperative and trustworthy will lead other participants to initiate to cooperate and trust the ones with a good reputation. Plus, this situation will motivate other participants to join the collective action and participate, since they will be shown a group of actors that contribute to the common cause and have trust in each other. As a result, the level of cooperation will increase and there will possibly be the creation of a positive circle of trust and cooperation, based on the good reputations that players are achieving over time while joining the collective action (Ostrom, 2007).

Common-pool resource dilemma

The collective action problem, according to the thought of different scholars, lays the foundation to a set of different issues in the economic theory. Among those, one of pertinent interest is the so labelled “common-pool resource dilemma” (CPR). Common-pool resource issues have been a subject upon which Elinor Ostrom has dedicated considerable amount of energy, time and that eventually have led her to be awarded with the Nobel Prize in 2009 (Wikipedia, 2017). In one of the most popular and adopted definitions of common-pool resource, Ostrom (1989) stated that it refers to a “sufficiently large natural or man-made resource that is costly, although not impossible, to exclude potential beneficiaries from obtaining benefits from their use”. A linked result of this is that individuals in a common-pool resource context would tend to take as much as possible of that resource, in a fashion that is over abundant, or else they would try to free-ride on the effort of other participants, obtaining the gains from the shared resources but not contributing properly (Garret, 1968; Gordon, 1954; Olson, 1965). The result, eventually, is the obstacle faced in producing the good and contributing to the common cause, leading to the non-provision or under-provision of that.

This broad and general definition has been subject of different revisions, interpretations and updates over the last years; as Ostrom herself explained (2002), a great number of common-pool resources are described by complicated and complex characteristics and features, which leads to the inevitable creation of different settings in which to apply the theoretical framework concerned.

To be clearer, it is relevant to highlight that some scholars have put more emphasis on the notion of common from a different perspective than the usual one, more tied to the social practice underlying it, instead of strictly focusing on the physical features of the good (Bennholdt-Thomsen, 2012; Muhl, 2013). According to Muhl (2013), a common becomes as such not because of the material characteristics, but in connection to the use and intention of people and communities using that common good, based on self-given norms and rules. Following this definition, commons depend on the typology of interactions, relationships and rules tied to the use of the common good and between the people involved in its use (Helfrich, 2012).

In one of her main works, Ostrom (1990) tried to analyze different empirical settings tied to the management of common-pool resources, so to eventually identify a common base on which to build a theory aiming at explaining the success of such collaborative initiatives. In so doing, Ostrom tried to help scholars and researchers by providing a set of so-called “design principles” which are supposed to explain robust and long-enduring common-pool resource institutions. Besides, these design principles are considered as effective means to influence and incentivize possible individuals to join the CPR initiative and collaborate (Ostrom, 1990). Each of the seven principles presented in the work have been explained and clarified.

Key factors for a successful collective action in the Big Data field

Through this extensive but necessarily not complete literature review about the theories behind a collective action, we were able to identify some of the main variables linked to the increasing of the likelihood of attaining a concrete common action by all participants in the pursuit of a shared goal.

To the purpose of this study, the theoretical framework aforementioned will serve as a basis on which to anchor our empirical data collection, by devising our own model drawn from the main variables and features mentioned in this context.

The main idea behind this model is that the role of factors tied to the trust issue in collective actions, in tandem with the ones linked to successful structural and organizational features within the same context,

will work positively toward the encouraging of a player in joining a common project, that is, to participate to a collective action (figure 2.4).

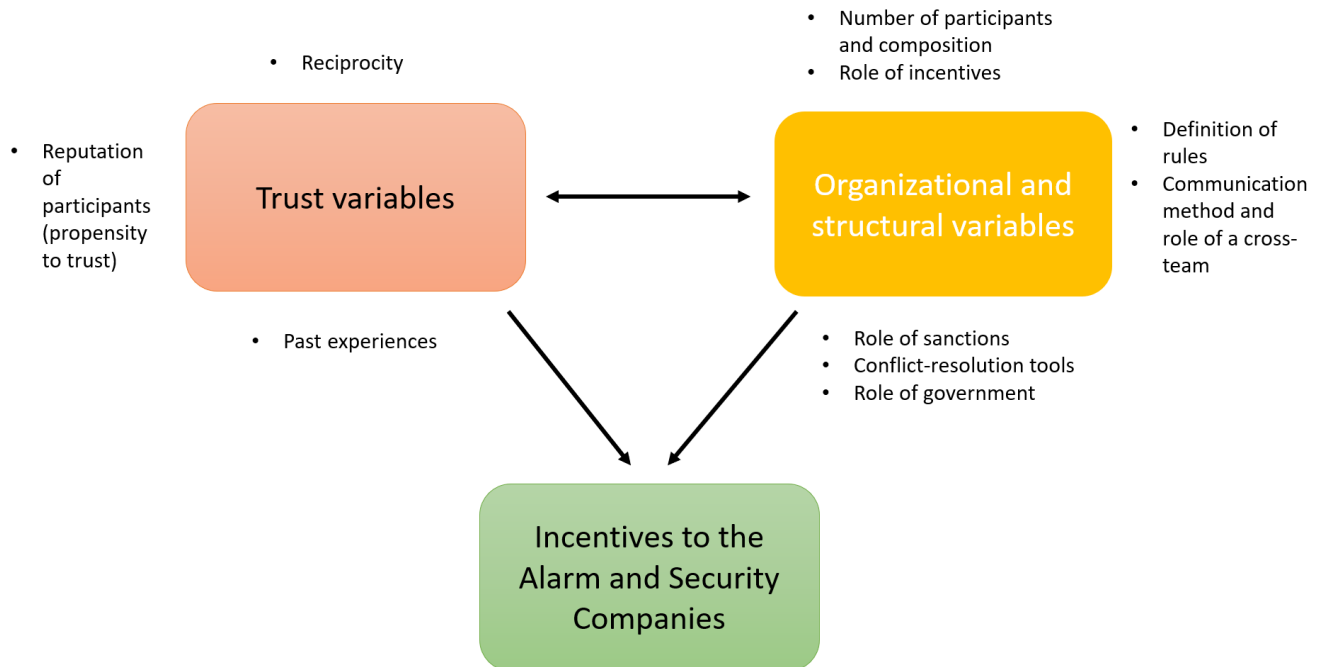


Figure 2.4 Key factors for a successful collective action in the Big Data field.

Source: own elaboration.

METHODOLOGY

The main aim of this study is to understand and find out which factors can work as incentives in encouraging companies to join a collaborative project in the context of Big Data sharing. The collective action in this case refers to the actual creation of a sustainable and well-thought-of Sandbox Model, where all the participants are willing to participate and embrace the initiative proposed by SBF. This work, plus, is mainly interested in companies belonging to the Alarm and Security Industry. In accomplishing this task, we profited by the help of a set of areas and topics concerning the issues of trust and organizational features in determining a successful collective action. This way, our research had a clear guidance and strong starting point to answer our research question.

In order to achieve the goal of this research, we aimed at collecting the point of view and opinions of managers and academics so to let emerge the factors working as incentives and the ones possibly hindering the collaboration project at the other end of the spectrum.

Nonetheless, to further emphasize, the previously illustrated theoretical background will work as backbone of this work, guiding the research and defining a pathway to be followed so to address our research question. To this purpose, a qualitative research seemed to be the most appropriate research strategy to implement. As a matter of fact, through a qualitative analysis the actual point of view and beliefs of the interviewees will have the chance to emerge. As showed by Bryman and Bell (2011), by relying on a qualitative method the emphasis is put on the world and the social phenomenon as perceived and seen through the eyes of its participants.

Building on this, new concepts and theoretical features could arise, confirming what was already posited by scholars or generating new streams of theory.

This research will rely on a comparative design, where the same method of research will be applied to all the cases studied, so to favor the understanding of a social context and phenomenon thanks to the comparison of cases. Indeed, the main goal of the work is to gain a deep understanding of how the different interviewees perceive and evaluate the theoretical areas outlined and build our conclusions upon that. In so doing, the various case studies will be analyzed and then compared, fostering the creation of theories and concepts as well as relevant discrepancies between theories and findings. In fact, by contrasting and comparing the findings from each case it will be possible to highlight what is unique and what is common between the cases, promoting the creation of related theories (Bryman and Bell, 2011). Theory building, nonetheless, is one of the strongest argument in favor of the comparative design, since the researcher finds himself in a better position to understand where theory holds and under which circumstances it does not (Bryman and Bell, 2011).

Apart from the cases related to the companies within the Alarm and Security Industry, this work contains the contribution of academics, so to obtain their point of view on the main subject of this thesis, namely the role of the different factors involved.

The method chosen for the collection of primary data is the qualitative semi-structured interview. By using this method, it was possible to address the main issues of this work while simultaneously rely on a degree of flexibility during the whole interview. Indeed, during the collection of primary data it was

possible to change the order of the questions, to ask follow-up questions and to come up with new ones so to better address our main goal (Bryman and Bell, 2011). Besides, the semi-structured interviews allowed us to ensure that the most important topics, mainly derived from the theoretical model, were nicely addressed and reflected upon by the interviewees.

For the undertaking of this work we were working in tandem with First to Know, a consulting company located in Sweden which took up a project by SBF, as explained in the introduction. Consequently, both First to Know and SBF helped us to find relevant companies belonging to the Alarm and Security Industry to ask for interviews. Additionally, the typology of people to be interviewed within these companies were managers with experience in that field. This was important to have relevant sources where to gather information from and to benefit from the great degree of expertise and experience borne by these individuals. Along with managers from Alarm and Security companies, we believed it was remarkably important to include in the generation of primary data experts coming from the academia in terms of Big Data management and innovation (table 3.1).

To the purpose of this work the method used to analyze data relied on the grounded theory approach. Subsequently, after each interview it was create a transcript of the same, leading to the simultaneous analysis of it soon after. The process used was based on the open coding technique, which allowed us to examine data and afterwards conceptualize them and, eventually, put them in different categories. The comparison of the data was a significant and important part of this method, leading to the understanding of the phenomenon and the explanation as well as formulation of possible theories (Bryman and Bell, 2011). In fact, the main findings and conclusions of this work derive from the comparative analysis of the cases involved in this project, keeping sight of the theoretical framework where we started from. While doing this, particular emphasis was put on the finding of relevant patterns and recurring relationships among the data collected and coded.

Name of interviewee (job position)	Company (domain)	Type of interview	Length	Identification letter
Carl Billton (Head of Sales and Marketing)	Raybased (alarm and security industry)	Face-to-face	50'	A
Mattias Hultman (Business Developer)	Sector Alarm (alarm and security industry)	Face-to-face	45'	B
Daniel Yar (CEO at Eductiv, Ass. Professor Innovation and Data Science)	Eductiv / Högskolan i Borås (academia)	Skype	35'	C
Henrik Jaldell (Researcher in Economics)	Karlstad University (academia)	Skype	30'	D
Johan Granton (Country Divisoin Lead)	Siemens (alarm and security industry)	Skype	55'	E
Andreas Persson (Product Specialist, Field Operations Development)	Verisure (alarm and security industry)	Skype	45'	F

Table 3.1 *list of interviews.*

ANALYSIS AND CONCLUSIONS

After having collected the empirical findings, we undertook the analysis of them, leading to the answering of the research questions. In so doing and accomplishing the main research goal of this thesis, I found useful and more opportune to separately address the two sub-research questions, which, combined together, will provide the answer to the main research question.

Sub-research question 1:

❖ *What is the role of trust-related factors according to the Alarm and Security companies?*

Investigating this topic has resulted to be interesting as well as intricated, being trust a factor which involves many more ones in itself. Interestingly and strictly tied to the main characteristic of a partnership, trust seems to be developed more effectively when potential participants share a common goal and work towards the achievement of a shared purpose, which ensures a smooth implementation of the project. Besides, in order to foster the creation of trust among partners, a prominent feature turns out to be the attitude of companies in the direction of open dialogue and constant communication, as well as to share information between each other. Indeed, this would allow the correct development of the relationship through discussions, idea sharing and continuous communication to solve minor conflicts and get to know each other better over time.

To create a basis where to build trust, moreover, potential participants would look for information regarding other companies in the common project, using this method not only to accomplish trust-related issues, but also to obtain other relevant information to opportunely ponder over a collaboration.

According to the findings, trust is not particularly involved in the theory of reciprocity, where witnessing or trusting that a company will reciprocate the efforts of other companies will lead to higher levels of cooperation and contribution (Ostrom, 2007). In fact, resource-related constraints, ingrained expectations or a detached analysis of the context in which an over or under-contribution takes place will guide the response of a company; this, however, is not necessarily matching with the contribution of the over or under-performing company in question, and can assume different levels, unrelated to the actual contribution of the former.

Furthermore, past experiences of collaborations of a company are showing a noteworthy relevance when companies have to evaluate whether to trust another company to form a new partnership. Indeed, good experiences would lead to a greater degree of willingness to take up new partnerships, whereas the opposite holds true in return.

On the other side, trust can also be damaged by certain behaviors, and one common feature which resulted repeatedly is linked to the scenario in which participants focus excessively on personal gains and benefits, losing sight of the common purpose and adopting selfish behaviors which contrast with the inherent goal of a common project.

Sub-research question 2:

- ❖ *What is the role of relevant organizational and structural factors of the common-pool resource institution, drawn from the literature review, in the eyes of the Alarm and Security companies?*

As a starting point, one controversial issue boils down to the most desirable number of organizations to be involved in the Sandbox Model, given its main features and purposes. Indeed, there is no uniformity and complete agreement over the most suitable number of companies for this project. Consequently, this is a feature to develop over time when companies will obtain a greater understanding of the needs of the Sandbox Model.

It is paramount to incentivize companies to stay committed and comply with the rules of the project, and financial incentives are seen as an effective tool, alongside with non-financial ones, where emphasis is principally put on the possible value that can be extracted from this collaboration. Plus, aside from other techniques, sharing a common purpose can act as a powerful tool to push companies to work towards the objective of the Sandbox Model.

In the model, the definition of rules is necessary for a proper execution of the project, but companies are not interested in the definition of the first draft of rules and regulations, whereas their role would be to work in the direction of a common understanding of these rules and the possible modification or adding of new rules. Indeed, the definition of rules is seen as a process to be refined overtime.

Communication is a relevant part of the everyday life of an organization, and many different tools and mechanisms are being developed to tackle this potential issue, which seems to be not as problematic as in old days. The expected usefulness and desirability of a cross-team within this context is not perceived as particularly relevant by organizations, if not for the possibly frantic initial phase of the Sandbox Model, where more communication and coordination might be requested.

Sanctions do play a role when companies transgress, and a “zero-tolerance” policy is labelled as necessary. However, it is relevant to accurately tailor the sanction to the nature of the crime.

Conflicts and minor misunderstandings will inevitably occur during the implementation of the Sandbox Model, and formal mechanisms to face them are sought for. Besides, various possible tools are devised,

showing how vast is the area in this context. Sharing a common vision and purpose is, among other factors, perceived as helpful in avoiding the burst of conflicts. Plus, continuous dialogue and open communication can further contribute to facilitate the solution of minor misunderstandings.

In evaluating a collaboration proposal, aside from sharing a common goal and purpose, companies do look for personal gains, which do not necessarily have to be found to be financially-related. The stress is chiefly on the value coming from this project, defined in a broad perspective, such as being involved in the most technologically advanced areas or learning from the partners in the collaboration.

The government, lastly, can be of great helpfulness for this project, showing the most apt pathway to go through and supporting, consequently, this initiative.

Lastly, the work ends with the recommendation part, divided as follows: the first part focused on suggestions and advices strictly tied to the purpose of this work, namely the successful implementation and development of the Sandbox Model; the second part tried to draw more general and widely applicable recommendations to companies trying to work together through a partnership.

At the very end, a spectrum of future researches and works related to the Sandbox Model were illustrated, leading to the conclusion of this thesis.