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MSc Thesis in Business and Management

The Value of Design Thinking

A case study investigating how Design Thinking influence the Innovative Capability of a public sector organization in its work against complex societal problems

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Abstract

Design Thinking is a growing interest among scholars and practitioners within various contexts as they search for new approaches to manage the increasing number of wicked problems in society for which Design Thinking has been argued to be applicable. Given this argued applicability, Design Thinking has received widespread praise as scholars have debated that it is a universal tool that can provide value through innovation independent of domain, contributing further to its speedy growth. However, the area lacks empirical research supporting its significant claimed value, especially in contexts other than the business context, leading to several scholars calling for it to be regarded as a management fad. Research taking a performative perspective on Design Thinking within contexts other than the business context, like the public sector, has consequently been called for. However, measuring innovation is challenging, especially within service organizations like the public sector. Nevertheless, a theory argued to be applicable to accomplish this is the Innovative Capability theory, regarded as an organization's muscle for innovation. However, research within this area and the intersection is currently scarce, especially within the public sector domain, leading scholars to similarly call for additional work. In response, this study has been purposed to investigate how Design Thinking influences a public sector organization's Innovative Capability when working against complex societal problems. In doing so, an explorative qualitative case study, adopting an abductive approach, was adopted, utilizing semi-structured interviews to investigate how Design Thinking influenced the determinants of the Swedish Police Force's Innovative Capability and, thus, Design Thinking's influence on their Innovative Capability. Findings revealed that Design Thinking changed the determinants of Innovative Capability Resources and Processes while only influencing the other identified determinants, Structures, and Values and Culture. The study concluded that Design Thinking did not have an aggregated effect on the sample organization's Innovative Capability. Several practical implications were also identified, guiding public sector practitioners in how Design Thinking can contribute value to their organization. Lastly, future research avenues were suggested to guide scholars in further exploring the value of Design Thinking and understanding of Innovative Capability within public sector organizations.

Key words: Design Thinking, Innovative Capability, Determinants of Innovative Capability, Public sector organization

Acknowledgments

Definitions

Term	Definition in this study
Nationella operativa avdelningen (Noa)	The police's national operational department is an organizational unit established in January 2015 within the Swedish Police Force. Noa directs and leads operations nationally and internationally and supports the various police regions in high-priority operations (Polisen, 2023).
Wicked Problem	Complex and multidimensional problems in nature, leading to these problems resisting easy definitions and solutions (Rittel & Webber, 1973).
Design Thinking (DT)	A human-centered approach to innovation that draws from the designer´s toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success (Brown, 2008).
Innovative Capability (IC)	The firm's ability to be competitive through systematic innovation, including reconfiguring the firm's resources and processes and the values that influence how decisions are taken in the organization (Carlgren et al., 2014).
IC determinant Resources	Resources are, for example, knowledge, competence base, available technology, number and quality of external networks, and relationship with stakeholders (Carlgren et al., 2014).
IC determinant Processes	Ways of working within the organization concerning innovation and the methods used to facilitate it (O'Connor; 2018).
IC determinant Structures	How an organization structures its human capital and the systems and rules governing these organizational structures (Lawson & Samson, 2001).
IC determinant Values and Culture	The underlying values, norms, and culture that governs how decisions are taken within the organization (Carlgren et al., 2014).
IC determinant Strategic Intent	How innovative the strategic intent is of the organization (Carlgren et al., 2014).
The Trained	The group within the Police Force that had undergone training in Design Thinking and worked with the method.
The Explorers	The group within the Police Force that had not undergone training in Design Thinking but worked with the method.
The Inexperienced	The group within the Police Force that has had no experience of Design Thinking.

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1 Introduction

1.1 Background

We live in a world characterized by ever-increasing complexity and uncertainty, making us question prevailing values and traditions, triggering a profound transformational impact in our societal structures, independent of sector and society (Uhl-Bien, 2021). Driven by trends such as globalization, digitalization, and polarization, these challenges are increasing demand on all of society's stakeholders (Head, 2022). As a vital part of any society, public organizations are no exception as they are facing both growing demand for services and increased complexity in the services demanded, all while operating with constrained resources, balancing polarized stakeholder groups with competing views, and increasing bureaucracy. In totality, making it more difficult for them to address the constantly growing complex societal challenges present in today's societies (Jaskyte & Liedtka, 2022). The problem described is not limited to a country or region but rather a global issue affecting societies worldwide, requiring new approaches to resolve (OECD, 2017).

One of the most pressing challenges public organizations face on a global level is matters connected to organized crime, as these are increasingly affecting a multitude of societies in all parts of the world (Heinrich-Böll-Stiftung et al., 2013). Organized crime is a complex phenomenon that is difficult to quantify and comprehend, as it is rooted in large and complex societal problems, which are hard to find suitable solutions for (Head, 2022). However, even though challenging, they must be addressed, as failing to address these problems can lead to severe consequences, including social instability, economic disruption, and loss of life (UNODC, 2023). As criminal networks are constantly developing, the traditional approaches, deemed sufficient for public organizations yesterday, may today no longer suffice (Sjöberg, 2023). To not be overrun and consequently face the associated severe consequences, it is essential for organizations within the public sector and societies at large to discover and develop new ways to manage the increasingly complex issues present in today's societies (OECD, 2017).

One of the countries that have seen a significant increase in organized crime and gang violence is Sweden, where the, in recent years, increase in organized crime-related shootings, murders, and bombings has made the issue more evident for both the general public and lawmakers (TT, 2022; Underrättelseenheten, 2019).

As the situation has progressed and worsened, it has become evident for parts of the Police Force that the traditional approaches will no longer suffice against these complex problems and that new approaches are desperately needed (Sjöberg, 2023). One of these new methods, deemed an attractive option, was Design Thinking, hereafter referred to as DT, which was first implemented in 2021 as part of a project to investigate how the deadly violence could be reduced by applying the new methodology (ibid). DT was primarily chosen for its argued applicability to manage the problems faced by the Police Force, which according to Rittle and Weber (1973), can be classified as wicked problems for which DT has, in present literature, been argued to be a valuable and applicable tool to use when working with them (Arundel et al., 2019; Lewis et al., 2019). For this claimed applicability to manage these problems the approach has been, within the business context, widespread praise, since its popularization (Gruber et al., 2015; Johansson-Sköldberg et al., 2013).

DT was initially created within the field of innovation management to make the accumulated knowledge within the design domain accessible and value-providing in any domain and to anyone, independent of background (Brown, 2008; Brown & Katz, 2011; Johansson-Sköldberg et al., 2013) leading some scholars to even call it a universal value providing tool (Hobday et al., 2012). In the present literature, DT has been claimed to increase organizational innovativeness, independent of context (Brown & Wyatt, 2009: Dunne & Martin, 2006), increase companies' Innovative Capability, hereafter referred to as IC (Carlgren et al., 2014), and increase the overall performance (Wattanasupachoke, 2012). All of which have contributed to its rapid and widespread usage growth in numerous organizations within a variety of contexts (Johansson-Sköldberg et al., 2013) and ultimately to the adoption by the Swedish Police Force too, in their fight against organized crime, viewed as one of societies currently most pressing challenges (Heinrich-Böll-Stiftung et al., 2013)

1.2 Problematization

However, the area lacks empirical research supporting the large value claims made by several scholars (Carlgren et al., 2014; Johansson-Sköldberg et al., 2013), as earlier described, and especially outside of the business domain (Liedtka et al., 2020), leading to some scholars being hesitant toward the realization of the promised value and consequently calling the concept for a potential management fad (Hobday et al., 2012; Johansson-Sköldberg et al., 2013; Nussbaum, 2011). Highlighting the need for scholars to take a performative perspective of DT (Carlgren et

al., 2014) and especially within contexts other than the business context, such as the public sector (Liedtka et al., 2020). Given that the implementation of ineffective methods within this context can bear significant implications on societies, already scarce, shared resources, and the provided societal services (Mintrom & Luetjens, 2016), enhancing scholars' understanding in this area is important (Carlgren, 2013; Liedtka et al., 2020).

However, measuring innovation is hard (Carlgren, 2013) and even harder within service organizations, such as public sector organizations, as output measures, commonly used in the business sector, have low applicability in these types of organizations (Tura et al., 2008). Nevertheless, a theory argued to be applicable is IC, which is viewed as an organization's muscle for innovation (Carlgren, 2013; Carlgren et al., 2014). However, research within this intersection between DT and IC is currently scarce (Hobday et al., 2012) and especially within the public domain, as few prior works have applied the IC theory within this organizational context (Gullmark, 2021; Iddris, 2016) and no one has, to the best of this study's knowledge, used it to investigate the performative potential of DT.

1.3 Purpose and Research Question

In response to the identified knowledge gaps in the current literature and the value to society associated with filling them, the purpose of this study was created. The purpose of this study is to investigate how DT influences the IC of a public sector organization, such as the Swedish Police Force, and through this, generate further understanding surrounding the potential value of utilizing DT as a tool for managing complex societal problems for a public sector organization, and by this, also increase scholarly knowledge concerning the IC of a public sector organization. Based on the purpose of this study, the following research question was formulated:

How does Design Thinking influence the Innovative Capability of a public sector organization in its work against complex societal problems?

1.4 Expected Contributions

This study will contribute theoretically and practically by our enhancing understanding within several areas. Firstly, it will contribute to the research fields of DT and IC by increasing the performative understanding of DT, the connection between DT and IC, and scholars' understanding of IC, all within a public sector organization. Secondly, practical implications will be created contingent on the insights aimed at improving public sector practitioners' understanding of DT and how it can provide value to them. Lastly, this study will provide suggestions for future research areas deemed important to investigate further.

1.5 Research Outline

The above situation, problematization, and purpose of this study will be investigated using an explorative qualitative case study. By utilizing semi-structured interviews directed at organizational members of the Swedish Police Force, the relationship between IC and DT will be explored. An abductive approach, in combination with thematic analysis, is used to analyze the empirical data. Results are presented and discussed with possible implications of the study's findings. Overall, the study has been divided into six sections: (i) Introduction, (ii) Literature Review, (iii) Methodology, (iv) Empirical Findings, (v) Analysis, and (vi) Discussion & Conclusion.

2 Literature Review

The following chapter, firstly, presents an introduction to problem-solving and wicked problems (2.1). Next, DT is presented where its origin, core elements, applicability, and received criticism are all reviewed (2.2). Following this, the IC theory, its argued determinants, benefits, and criticism against it, are all presented (2.3). Next, the literature related to the intersection between DT and IC is presented (2.4). Succeeding this, a synthesis of the chapter where the study's relevant research gaps are presented (2.5). Finally, the study presents its theoretical framework, which concludes this chapter (2.6).

2.1 Problem-solving

Solving problems is a fundamental aspect of human cognition, which has been studied extensively in several fields (Goel, 1992; Simon, 1973). In past literature, problem-solving has been described as a search process through a problem space, where the problem space is defined by the set of possible states and the set of operators that can change one state into another (Goel & Pirolli, 1992; Newell & Simon, 1972). By this, Newell and Simon (1972) mean that problem-solving involves identifying and overcoming obstacles to achieve a desired outcome or goal as an individual or a group.

As can be expected from the above description of problem-solving, the process of problem-solving has, in previous literature, been seen to vary widely depending on numerous elements, but mainly because of the focal element of the process, the problem, and its specific nature (Simon, 1977). This point, made by Simon (1977), has made scholars classify problems depending on the nature of the problem, where it has been argued that problems can be classified as either well-structured or ill-structured problems (Goel, 1992; Simon, 1973; Simon, 1977). A well-structured problem can be described to have well-defined rules of procedures, clear goals, and a limited set of possible solutions. In contrast, an ill-structured problem can be described as a problem that is complex, ambiguous, and does not have well-defined solutions (ibid).

Building on the ideas of Simon (1973), Rittel and Webber (1973) introduced the concept of wicked problems to better encapsulate what Simon (1973) defined as ill-structured problems. The two authors originally described wicked problems to be complex and multidimensional in nature, leading to them resisting easy definitions and likewise solutions (Rittel & Webber, 1973).

Scholars have, since the introduction of the concept, continued to build on the concept, and wicked problems are today described to be characterized by: high levels of uncertainty, ambiguity, and conflicting perspectives; the absence of a clear problem statement or goal; and influenced by factors that can be difficult to control such as political, societal, and economical factors (Buchanan, 1992; Rylander, 2009). Common for both views of the concept, is the notion that wicked problems cannot be solved using traditional planning methods building on rational, as it assumes that problems can be clearly defined and solved through linear, step-by-step processes for which wicked problems cannot (Buchanan, 1992; Rittel & Webber, 1973; Rylander, 2009). To solve wicked problems, compared to well-structured problems, scholars have, instead of a linear process, argued for the use of a more collaborative and iterative approach involving multiple stakeholders and perspectives, which the approaches used by designers have been stated to encapsulate (Buchanan, 1992; Dunne & Martin, 2006; Hobday et al., 2012; Magistretti et al., 2021; Owen, 2007; Rylander, 2009).

2.2 Solving wicked problems using design approaches

The interest in design and designers' working methods is growing as companies, NGOs, public organizations, and societies search for new strategies to manage the ever-evolving wicked problems present in today's society (Johansson-Sköldberg et al., 2013; von Stamm, 2004; Walsh, 1996). However, the increasing interest in the area of design is not limited to the organizations trying to adopt the approaches. Johansson-Sköldberg et al. (2013) report a substantial increase in publications related to the topic of design as they identify two distinct discourses in the recent publications: one in design-based scholarly literature, referred to as Designerly Thinking, and one in business media, referred to as DT.

2.2.1 Designerly thinking – the origin of Design Thinking

Designerly Thinking refers to "the academic construction of professional designer's practice (practical skills and competence) and theoretical reflections around how to interpret and characterize this non-verbal competence of the Designers" (Johansson-Sköldberg et al., 2013, p 123). The discourse on Designerly Thinking dates back to 1969 when Simon's book, *The Science of the Artificial*, was released. In the book, Simon (1969) legitimized an experimental approach to design research. He articulated that the task of design was to create something new, while the task of science was to deal with what already existed, thus separating the two domains (Johansson-sköldberg et al., 2013).

Since its introduction, the academic discourse of Designerly Thinking has continued to develop and can currently be divided into three research themes (Johansson-sköldberg et al., 2013). The first theme refers to the systematic rationalized study of Design and builds on the work presented by Simons (1969). The second theme refers to the meaning of creation and mainly builds on the work by Krippendorff (2005). The final theme builds on the works by Schön (1983), Lawson (1980), and Buchanan (1992), who, through their combined work, presented the practical approach to the designer's practices and world, from which DT later was derived (Johansson-sköldberg et al., 2013).

2.2.2 Design Thinking and its core elements

DT was created within the field of innovation management with the intent to be a simplified version of the accumulated knowledge within the design domain, packaged to be accessible and valuable to individuals and organizations without design backgrounds and independent of context (Brown, 2008; Brown & Katz, 2011; Carlgren, 2013; Johansson-Sköldberg et al., 2013). For this, DT has received much praise, contributing to its rapid usage growth, which caught the attention of scholars, who increased their interest and debate within the field (Johansson-Sköldberg et al., 2013). One of the reasons for this substantial debate is, beyond practitioners increasing interest, is because DT is still a loosely defined term that conveys different meanings for different people, which consequently has led to a broad variation in scholarly definition (Carlgren, 2013; Johansson-Sköldberg et al., 2013). Proposed definitions of DT have in existing literature been observed to range from an approach (toolbox) that teams can use in problem-solving when working with wicked problems (Brown, 2008; Brown & Katz, 2011; Hobday et al., 2012; Owen, 2007), to an

approach which managers can use to learn from designers to help facilitate innovation (Carlgren, 2013; Dunne & Martin, 2006; Johansson-Sköldberg et al., 2013). Building on this notion, proposed conceptualizations have, in existing literature, also been many, as they both have taken different approaches and based them on different definitions (Carlgren, 2013; Johansson-Sköldberg et al., 2013). For example, Seidel and Fixson (2013) proposed the subsequent definition of DT utilizing a method-based approach: (i) need-finding, discovering the problem or possibility through observational research; (ii) brainstorming, ideating possible solutions; and (iii) prototyping, a means to quickly and cheaply test ideas and continue ideating.

In contrast, Kimbell (2011) proposed the following conceptualization of DT using a critical literature approach: (i) a cognitive style of designers engaged in problem-solving; (ii) a general theory of design as a field tasked with solving wicked problems; and (iii) an organizational resource. As seen, significant disparities prevail within the existing literature, and the phenomena is by scholars argued to be prevalent because DT is context-dependent and, consequently, takes different forms depending on the context (Carlgren, 2013; Hassi & Laakso, 2011; Johansson-Sköldberg et al., 2013; Kimbell, 2011). Empowered by this notion, some researchers have subsequently gone so far as to argue for the rejection of the idea of a single definition of DT, as they believe no single unique meaning exists, and by this highlighted that future DT research should focus on other currently unexplored areas instead (Carlgren, 2013; Johansson-Sköldberg et al., 2013).

A similar picture, like the one just conveyed, can be argued to apply to the earlier research concerning specific descriptions of DT, as a description, in turn, is dependent on what one perceives to be the definition and concept of DT, which successively is dependent on the context it is used in (Hassi & Laakso, 2011). However, although varied, several commonalities between the prevalent descriptions have been identified. For example, descriptions of DT tend to emphasize that it is a user-centric approach that focuses on a thorough comprehension of the user needs and the conditions in which they appear. Prevailing descriptions, moreover, also tend to stress that it is an iterative working process involving integrative thinking; extensive and early prototyping; and an open, embracing, curious, and empathic mindset, which in its totality should be supported by a learning-driven culture (Brown, 2008; Dunne & Martin, 2006; Liedtka, 2015). A commonly used description, proposed by Kelley and Littman (2001), took a process perspective of DT and

proposed that it consisted of five steps, or as Brown and Wyatt argue, "a system of overlapping spaces" (Brown & Wyatt, 2009, p. 33). The description of DT consisting of five steps, as proposed by Kelley and Littman (2001) can be viewed in Figure 1.

Step 1.	Step 2.	Step 3.	Step 4.	Step 5.
Understand the preconditions for the problem at hand	Observes users in their natural habitant through utilizing ethnographic research	Define insights to enable reforming of the problem	Ideate and prototype several potential solutions in rapid iterative processes	Test the prototype and utilize the feedback to either alter the solution, reiterate the solution or change the problem formulation and the assumptions that it is built upon

Figure 1. A process perspective of Design Thinking - the five steps proposed by Kelly & Littman (2001)

2.2.3 Design Thinking´s argued applicability and contribution

As a method, DT has been argued to be an all-embracing problem-solving approach (Brown, 2008; Dunne & Martin, 2006) that helps organizations, independent of type, to manage wicked problems better (Hobday et al., 2012; Magistretti et al., 2021) in a wide variety of sectors, situations, and contexts (Brown, 2008; Hobday et al., 2012). Thus, its area of applicable has, in previous literature, not been argued to be limited to the company domain (Clark & Smith, 2008; Gruber et al., 2015; Matthews & Wrigley, 2017) as scholars have, in a similar manner, argued for its relevance within the public domain (Frisk & Bannister, 2022; Liedtka et al., 2020; Mugadza & Marcus, 2019) whereby some even have labeled it as a universal tool (Brown, 2008; Hobday et al., 2012).

The topic of value and areas where DT has the potential to provide value has, in previous literature, been argued to both be significant and many, as DT has been argued to be a universal tool (ibid). Within the company domain, scholars have argued that DT has the potential to increase innovativeness within companies (Brown, 2008; Clark & Smith, 2008; Dunne & Martin, 2006; Glen et al., 2014; Simons et al., 2011), to improve an organization's IC (Carlgren, 2013; Carlgren et al., 2014; Magistretti et al., 2021), and to improve an organization´s overall performance (Dunne & Martin, 2006; Matthews & Wrigley, 2017; Wattanasupachoke, 2012). Conversely, scholars have also argued that DT can potentially increase innovativeness within the public domain (Arundel et al., 2019; Brown & Wyatt, 2010; Lewis et al., 2019). Although a less developed research area

(Jaskyte & Liedtka, 2022), earlier research, in addition to the proclaimed innovativeness increase, also argued for its potential to both increase efficiency (Nandan et al., 2020) and grass-root innovation (Brown & Wyatt, 2010; Frisk & Bannister, 2022).

2.2.4 Critique present in current literature towards Design Thinking

As just described, the potential benefits conveyed have been many and have contributed to the rise of a broad and speedy application of DT within a multitude of organizations in various contexts. However, although praised by some researchers, several scholars are also hesitant towards the realization of the promised value of the one-size-fits-all tool and call for the concept to be viewed as a potential management fad (Hobday et al., 2012; Johansson-Sköldberg et al., 2013; Nussbaum, 2011).

Up until now, empirical research on DT and its connection to innovation has been scarce, as scholarly focus, thus far, has mainly been conceptual (Johansson-Sköldberg et al., 2013). At present, most empirical studies have only investigated how the concept is utilized in the organizations applying it, which primarily have been located within the business sector, leaving other sectors, such as the public sector, lacking empirical research on DT (Carlgren, 2013; Liedtka et al., 2020). According to the critics, this has resulted in a general and populistic view of the concept being portrayed, based on the business context, whereby DT has been presented as a toolbox from which managers can pick and choose from as they want, unrestrained by context and prior experience, to achieve the promised results (Carlgren, 2013; Johansson-Sköldberg et al., 2013).

This portraial is seen by critics as troublesome for several reasons. Firstly, it can lead to organizations implementing the general view of DT in a context in which it is not optimal in, due to a context mismatch between where the general view was created and where the organization applies it (Brown & Katz, 2011; Liedtka et al., 2020) This might be especially troublesome in the public sector, as it is held accountable for providing value for all public citizens by using societies shared resources appropriately (Mintrom & Luetjens, 2016). Secondly, this general view of DT neglects the tacit knowledge embedded in the design principles on which DT is based (Johansson-Sköldberg et al., 2013). Thirdly, treating DT as a ready-to-use toolbox hinders the originally envisioned increase in creativity by limiting the cultural shift argued to be required to allow for this, which DT was initially created to enable, and that, in the long term, is in design, argued to be

the actual value creation enabler (Carlgren, 2013; Johansson-Sköldberg et al., 2013). Consequently, critics question whether the currently presented general model of DT can even provide the value conveyed in all of the different areas argued by scholars (Johansson-Sköldberg et al., 2013; Nussbaum, 2011).

Continuing on the same subject, Johansson-Sköldberg et al. (2013) also stress that due to scholars' conceptual focus, thus far, there is little empirical research that investigates the value created by DT, and the research that does exist, is usually based on either observations or experiences from the method's most prominent supporters. Moreover, the empirical research that has been conducted by others than the method's prominent supporters concerning the value of DT has primarily centered on better understanding the value enabled by the independent elements of the methods such as the tools, teams (multidisciplinary teams), and the work settings building up the process. Consequently, few prior works have taken an aggregated approach and focused on the total potentially associated value of applying DT in any context (Carlgren, 2013), and to the best of this study's knowledge, none have done it within the public sector context. In totality, scholars request future research to take an aggregated performative perspective of DT (Carlgren, 2013; Carlgren et al., 2014; Johansson-Sköldberg et al., 2013), whereas earlier literature primarily has used one out of two approaches (Carlgren, 2013). The first one has taken an output perspective by measuring the output of innovation, which often has been measured by either the number of filed patents or new products or by measuring the financial value of either the new products or the organization as a whole (Albaladejo & Romijin, 2000). Although good in theory, the method has been criticized in practice for its lacking ability to establish good causality, as it is hard to distinguish what is the result of what actions in larger organizations, and for its low applicability in service organizations, like for instance in a public organization (Tura et al., 2008). The second one has taken an aggregated perspective through the use of the capability perspective by investigating how DT affects an organization's IC (Carlgren et al., 2014), argued to be the organization's muscle for innovation and, thus, an indicator of future value creation enabled by innovation (Carlgren, 2013). Taking this lens has, in earlier research, been claimed to be a good way of investigating the potential values and effects related to DT as it has been suggested to provide a systematic understanding of these elements, independent of context, which for DT has been declared to be beneficial as the value of DT has been argued to be context dependent (Carlgren, 2013; Carlgren et al., 2014). However, although argued to be applicable, independent

of operational context, and often discussed in connection with DT, research within this area is scarce, as few researchers have gone into depth regarding what the discussed capability means and how DT can be linked to the capability described within the innovation domain (Carlgren, 2013; Carlgren et al., 2014; Hobday et al., 2012). Thus, although argued to be applicable, it is a research intersection that needs further research (ibid).

2.3 Innovative Capability

2.3.1 Introducing the concept of Innovative Capability

The concept of IC stems from the Dynamic Capability theory, whereby it is argued to encapsulate the innovative parts of an organization's Dynamic Capability. It thus describes an organization's innovative potential connected to its efforts to renew its resources and current capabilities to meet new demands put on them by the ever-changing external environment (Danneels, 2011; Eisenhardt & Martin, 2000; Trivellato et al., 2021). Although still regarded as a part of an organization's Dynamic Capability by some due to its adolescence, many researchers in past literature have also argued for its independence and consequently argued for it to be a capability of its own, which this study builds upon (Christensen, 1997; Lawson & Samson, 2001; O'Connor, 2008).

As it is a concept that still is in its conception, compared to the rest of the capability literature (Francis & Bessant, 2005), there is still, among scholars, a lack of agreement on how IC should be defined, as several definitions have been proposed in the existing literature (Carlgren et at, 2014; Mendoza-Silva, 2021). Drawn from the works of Lawson & Samson (2001) and O'Connor (2008), which, according to Mendoza-Silva (2021) and Iddris (2016), are two papers explicitly defining IC, Carlgren (2013, p.15) suggests the following definition for the IC of an organization:

"The firm's ability to be competitive through systematic innovation, including reconfiguration of the firm's resources and processes as well as the values that influence how decisions are taken in the organization"

Highlighting that the underlying key elements of the capability, enabling systematic innovation for a firm within the business context, are resources, processes, and values (Carlgren et al., 2014).

2.3.2 The building blocks of an organization's Innovative Capability

Because of its many proposed definitions, IC has also been conceptualized in several ways in the existing literature, emphasizing different underlying elements (Carlgren, 2013; Iddris, 2016; Mendoza-Silva, 2021). In an effort to synthesize earlier research, Carlgren et al. (2014) took inspiration from the works of O'Connor (2008), Lawson and Samson (2001), Björkdahl and Börjesson (2012), Börjesson and Elmquist (2012) and Christensen (1997) as they suggested a synthesized conceptual framework consisting of four elements: (i) strategic intent, (ii) resources, (iii) processes, and (iv) mindsets to describe the IC of an organization, within the business context. Building on the work by Carlgren et al. (2014), the works upon which it is based on, and others conducted after the work by Carlgren et al. (2014), this study summarized the, by these works, proposed elements and determinants building up the IC of an organization, within the business context, and recognized five overarching themes in terms of elements or determinants. The overarching themes, as recognized in existing literature, were: (i) *Resources*, (ii) *Processes*, (iii) *Structures*, (iv) *Values and Culture*, and (v) *Strategic intent.* A summary of how these themes relate to the literature, upon which on they are based on as well as the entail, can be viewed in Figure 2.

Summary of previous research	Connected prior works to Innovative Capability		
	O'Connor (2008)	*Lawson and Samson (2001)*	*Björkdahl and Börjesson (2012)*
Resources	**Skills and talent development** Cross-disciplinary teams with a broad set of skills that receive constant feedback	**Harnessing the competence-base** Apply resource management and ensure resources from multiple sources. Be on the lookout for innovation champions **Organizational intelligence** Create knowledge about customers' unseen needs and unexplored avenues in the industry	**External environment and linkages** To what degree the organization focuses on building a network outside the organization from which they can gain additional knowledge **Organizational Context and learning** How the organization nurtures knowledge from old projects and leverage it in new projects and between teams within the organization
Processes	**Mechanisms for interfacing with the mainstream organization** Clear reporting relationships and structures to ensure Mainstream and Newstream meet and share knowledge **Exploratory process** A process focused on experimenting and learning through hands-on actions and cross-disciplined networking	**Creativity and idea management** Knowledge or vision-driven management of idea generation that stressed the need for out-of-the-box thinking **Management of technology** Ensure that the firm uses technology that enhances the strategic, operational, and innovative performance of the firm	**Prioritization** The extent to which it is prioritized to work with novel and innovative ideas and projects **Idea management** The structures, systems, and routines in place to facilitate the search for and generation of new ideas **Implementation** The firm's ability to implement ideas and if they are incremental or radical ideas that get implemented
Structures	**Organizational structure** The teams tasked with major innovations are decoupled from the central organization **Governance and decision-making mechanisms** Project portfolio of significant innovation projects that are constantly re-evaluated	**Organizational structure and systems** Utilization of a formal business structure but which does not build up more structure than nessecarry. Ensure breaking down barriers separating functions. Reward systems that promote innovation and use stretch goals for innovation	**Systems and decision rules** The systems and rules in place to decide funding and overall strategy and operational decisions
Strategic intent	**Objective aligned with the firm's strategic intent** The firm has a strategic intent to become more innovative	**Vision and Strategy** The overall vision and strategy are connected to innovation	**Strategy for innovation** The conscious and systematic application of an expressed intent to innovation and to what degree it is conceived and operationalized
Values and Culture	**Culture and leadership** Build a culture that understands the importance of major innovations to be able to withstand shifts in the top leadership	**Culture and climate** High tolerance for ambiguity, empowered employees with designated time to be creative. Open communication throughout the organization to facilitate knowledge sharing	**Culture** The organization's overall frame of mind in terms of exploration and experimentation and how it views failures (as failures or opportunities to learn)

(Left vertical header: Determinants of Innovative Capability)

Figure 2. Summary of Innovative Capability determinants as identified in earlier works part 1 (2)

Summary of previous research		Connected prior works to Innovative Capabiltiy		
		Carlgren et al. (2014)	*Iddris (2016)*	*Mendoza-Silva (2021)*
	Resources	**Resources** Sees resources as knowledge, competence base, available technology, number and quality of external networks, and relationship with stakeholders	**Knowledge management** The organization's ability to utilize its knowledge base and manage new knowledge to ensure that it benefits and is accessible to the broader organization **Collaboration** Utilization of internal and external collaborations to share knowledge and build more robust networks for increased collaboration and knowledge sharing **Creativity** How creative the organization, industry, team, and individuals are. They are a function of other elements and how well they are functioning	**Technology** To what extent technology is used to facilitate innovation and innovative behavior **External Relations** To what extent does an organization possess external relations that can help to identify, gain or apply knowledge for the further development of their innovative activities **Know-how development** The ability of an organization to transfer tacit knowledge between individuals to explicit knowledge to be used by the broader organization **Individual activity** Concerns the personal characteristics and motivation of the employees to perform and undertake innovative activities
	Processes	**Processes** Ways of working with innovation within the organization and the systems and rules which govern these organizational structures	**Organizational learning** It should be deeply rooted in the organization to enable the organization to utilize internal and external expertise as needed **Idea management** An organization's ability to convert ideas into new products, services, or ways of doing things that are better than the old ways of doing things. How the organization handles and nurtures generated ideas	**Resources planning** The ability to leverage resources (people, knowledge, technology, networks, and financial resources) to ensure an accumulation of learnings and experiences **Management styles and leadership** The aggregated level to which management and leadership support and facilitates innovation. Refers to the day-to-day management
	Structures		**Leadership** Strong leadership that facilitates and encourages innovation. Acts as a support for the rest of the innovative organizational system	**Ideation and organizational structures** How the work is divided and organized within the organization. A focus on limiting barriers to facilitate cross-sectional learning. The reward system is also connected to this category **Network characteristics** How the different networks a firm connects to function and are structured. It can be divided into three dimensions. (i) The structural dimension concerns the structure and how information is shared. (ii) The relational dimension refers to the character of the relationships that have been formed between actors. (iii) The cognitive dimension refers to the resources in a relationship (ex, a system of meaning that facilitates a common understanding of goals)
	Strategic intent	**Strategic intent** How innovative the strategic intent is of the firm	**Innovation strategy** How much emphasis is on innovation in the firm's overall strategy? Helps guide decisions within the firm on all levels and facilitates decision-making in relation to innovation	**Corporate strategy** How clear is the firm about its strategic intent to innovate and where and how it should innovate
	Values and Culture	**Mindset** The underlying values, norms, and culture that governs how decisions are made within the organization	**Organizational culture** A culture that promotes the empowerment of employees, a tolerance for failure, effective communication within the firm and with stakeholders, and that has a positive attitude towards innovation	**Work climate** Comprises corporate values and beliefs and builds up the culture. Guides the company in how to solve problems and how positively they view innovation

Figure 2. Summary of Innovative Capability determinants as identified in earlier works part 2 (2)

On the other hand, within the public context, there is very little research connected to what constitutes an IC within a public organization, as stated by the writer of, to the best of this study's knowledge, only paper within this area (Gullmark, 2021). In his paper, Gullmark (2021) argues that within a public organization, the IC can take on one out of two forms, highly-routinized or low-routinized IC. These different types consist of three, respectively, four underlying concepts. According to Gullmark (2021), low-routinized IC consists of the concepts (i) public entrepreneurs, (ii) political and managerial leadership, and (iii) employee empowerment, while highly-routinized

IC consists of the concepts (i) interdisciplinarity and organizational learning, (ii) networking, (iii) central support for innovation development and implementation, and (iv) flat and flexible organizational structure.

Before moving on, Mendoza-Silva (2021) highlights that there has been a lack of consensus concerning which word to use when describing the underlying driver for an organization's IC. The words dimension, elements, and determinant have, in earlier research, been used, which has resulted in difficulties when comparing results across studies (ibid). To facilitate, this study has chosen to use the word determinant when referring to an underlying driver of an organization's IC, as used by Mendoza-Silva (2021).

2.3.3 Benefits and critique towards the concept of Innovative Capability

Taking a capability perspective on innovation has, in present literature, as earlier stated, been argued to be beneficial for several reasons. One of the main argued benefits of the concept is that it provides a holistic and systematic way to investigate innovation (O'Connor, 2008) that can be used independently of the domain, thus applicable in both the business and public context (Carlgren, 2013; Gullmark, 2021; Trivellato et al., 2021). Consequently, providing scholars and organizations with a way to understand why some organizations are better positioned to make the most out of innovation compared to others, as well as how to improve their position in a systematic way (Carlgren, 2013; Carlgren et al., 2014). However, this benefit has also been questioned, as several scholars have criticized the concept's underlying theories for being too abstract and on too high of a level to empirically investigate (Björkdahl & Börjesson, 2012; Kliesch-Eberl & Schreyogg, 2007). Elaborating on this point, Lawson and Samson (2001) explain that critiques, above all, question the underlying theories of the concept on three points. Firstly, it is difficult to accurately pinpoint what firm resource(s) or capability(ies) is responsible for the performance. Secondly, because this can first be done ex-post, consequently a resource or capability may first be labeled valuable after the organization has become successful. Lastly, in this setting, failure can easily be attributed to the lack of a resource or capability, thus neglecting the complexity associated with it through its interconnectivity with other firm resources and capabilities (Lawson & Samson, 2001). However, even though criticized, researchers nevertheless argue for its benefits as it provides them with a tool, enabling them to take a holistic and systematic approach to understanding organizational innovativeness. Thus, empowering them to move beyond only

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investigating the innovativeness of isolated organizational processes and elements, which is common in most of the earlier research, and instead investigate the aggregated view of organizational innovativeness, which, moreover, also have been requested (Crossan & Apaydin, 2010; Lawson & Samson, 2001; O'Connor, 2008). However, as earlier highlighted, the area of IC is in its early stages (Carlgren, 2013; Francis & Bessant, 2005), and there is, consequently, a need to further develop this area through additional research (Börjesson & Elmquist, 2011; Francis & Bessant, 2005; Iddris, 2016; Kliesch-Eberl & Schreyogg, 2007; Lawson & Samson, 2001; Mendoza-Silva, 2021) and especially within domains other than the business domain as highlighted by Gullmark (2021).

2.4 The intersection between Design Thinking and Innovative Capability

In the past, the intersection between DT and IC has been an area of little scholarly interest, resulting in few prior works and, thus, a call by scholars for more research (Carlgren, 2013; Carlgren et al., 2014; Hobday et al., 2012). It has, although, by Hobday et al. (2012) been stated that DT can contribute to an organization's IC by providing it with a method to manage wicked problems from which new possibilities for problem-solving and solution creation can emerge. In another study, Carlgren et al. (2014) argued that DT could contribute to an organization's long-term innovativeness by contributing to the determinant's resources, processes, and mindset. These findings were derived from their investigation analyzing the values perceived by organizations utilizing DT through the IC lens. Consequently, showing that DT had a perceived and actual effect on these determinants, argued to both be a potential contributor of long-term innovation and DT being related to building long-term IC within the organization, as earlier also suggested by Carlgren (2013). While simultaneously, as earlier described, portraying IC as a valuable tool to evaluate the effects of applying DT within an organization (Carlgren, 2013; Carlgren et al., 2014; Hobday et al., 2012).

2.5 Synthesis and presentation of research gaps

To synthesize, DT has, in present literature, been argued to be a suitable approach for dealing with wicked problems (Brown & Katz, 2011), which is a problem definition encapsulating a majority of the complex problems today faced by both public and business organizations worldwide (Johansson-Sköldberg et al., 2013; Rittel & Weber, 1973). Thus, it is an approach, which for its argued applicability to facilitate complex problem-solving, has received much praise and fast and broad adoption within many different contexts (Carlgren, 2013; Gruber et al., 2015; Holloway, 2009). However, research on DT has been chiefly conceptual (Johansson-Sköldberg et al., 2013), and few studies have been conducted outside the business context (Carlgren, 2013; Liedtka et al., 2020), even though the promised value and effect of using the method has been argued to be large and independent of context (Arundel et al., 2019; Brown, 2008; Dunne & Martin, 2006; Hobday et al., 2012). This has led to several scholars questioning the argued benefits of the concept, even calling it a potential management fad (Hobday et al., 2012; Johansson-Sköldberg et al., 2013; Nussbaum, 2011), and consequently called for additional research within the area as few studies have taken a performative perspective and especially within contexts other than the business context, such as the public sector (Carlgren, 2013; Carlgren et al., 2014; Johansson-Sköldberg et al., 2013), which, to the best of this study's knowledge, no one has previously done. Thus, presenting this study with its first identified knowledge gap.

In the earlier highlighted effort of taking a performative perspective of DT, the theory of IC has been argued to be applicable. However, few prior studies have investigated this connection, even though references have been common (Carlgren, 2013; Carlgren et al., 2014). Thus, researchers argue that it is another area needing additional research (Carlgren, 2013; Carlgren et al., 2014; Hobday et al., 2012). Consequently, this study views it as its second identified knowledge gap.

Although IC is an area of growing interest (Carlgren, 2013; Gullmark, 2021; Iddris, 2016), it is still an area seen by many to be in its early stages (Carlgren, 2013; Francis & Bessant, 2005). It is a theory stemming from the Dynamic Capability literature, and even though the concept has been discussed in the literature since the beginning of the 21st century, researchers are still not in agreement concerning the definition, conceptualization, and which the underlying determinants are (Björkdahl & Börjesson, 2012; Börjesson & Elmquist, 2011; Lawson & Samson, 2001; O'Connor, 2008). It is, nevertheless, even though the lack of theoretical foundation, argued to be

a well-suited theory to systematically understand an organization's innovative potential (Lawson & Samson, 2001; O'Connor et al., 2008). However, additional work is both needed and requested to better understand the overarching theory (Börjesson & Elmquist, 2011; Iddris, 2016; Kliesch-Eberl & Schreyogg, 2007; Lawson & Samson, 2001), how the capability can be built (Börjesson & Elmquist, 2011; Kliesch-Eberl & Schreyogg, 2007; O'Connor et al., 2008), and especially within the public domain, since almost all of the work has been done within the business domain. (Gullmark, 2021; Iddris, 2016). Thus, the study identifies its third and last knowledge gap, which concerns enhancing the understanding of IC within the public domain.

2.6 Theoretical framework

To thoroughly investigate the performative value of DT through the theoretical lens of IC within the public sector and consequently also the three identified knowledge gaps, a theoretical framework has been developed based on the insights provided in the literature review, as illustrated in Figure 3. The framework has been designed based on the summary of the determinants identified in the present literature, thus building on several prior works within the field of IC (Björkdahl & Börjesson, 2012; Börjesson & Elmquist, 2012; Iddris, 2016; Lawson & Samson, 2001; Mendoza-Silva, 2021; O'Connor, 2008). Consequently, the framework includes the determinants (i) *Resources*, (ii) *Processes*, (iii) *Structures*, (iv) *Values and Culture*, and (v) *Strategic intent*, which together are argued, in prior works to make up an organization's IC and thus, its muscles for innovation (Carlgren, 2013). The use of an IC perspective to investigate the performative value of DT within a public sector organization was selected for several reasons. Firstly, because it has been argued to be a suitable approach to take (Carlgren, 2013; Carlgren et al., 2014) as output measures bear several disadvantages and have been argued not to be applicable in a service organization, which public sector organizations are considered to be (Tura et al., 2008). Secondly, in previous literature within the public context, the theory has been suggested to be a suitable approach to better understand the innovative process within a public organization, which this study is partially aiming at (Gullmark, 2021). Thirdly, because of its argued ability to systematically investigate the performative perspective of DT, as also seen in earlier works taking a similar approach within the business context (Carlgren, 2013; Carlgren et al., 2014). Lastly, taking an IC perspective allowed this study to answer the call by Gullmark (2021) for more research on IC within public sector organizations, thereby aiming to fill the final identified research gap, which

was deemed to be associated with several benefits. The theoretical framework incorporates this study's research question in the horizontal process starting from the left-hand side in Figure 4.
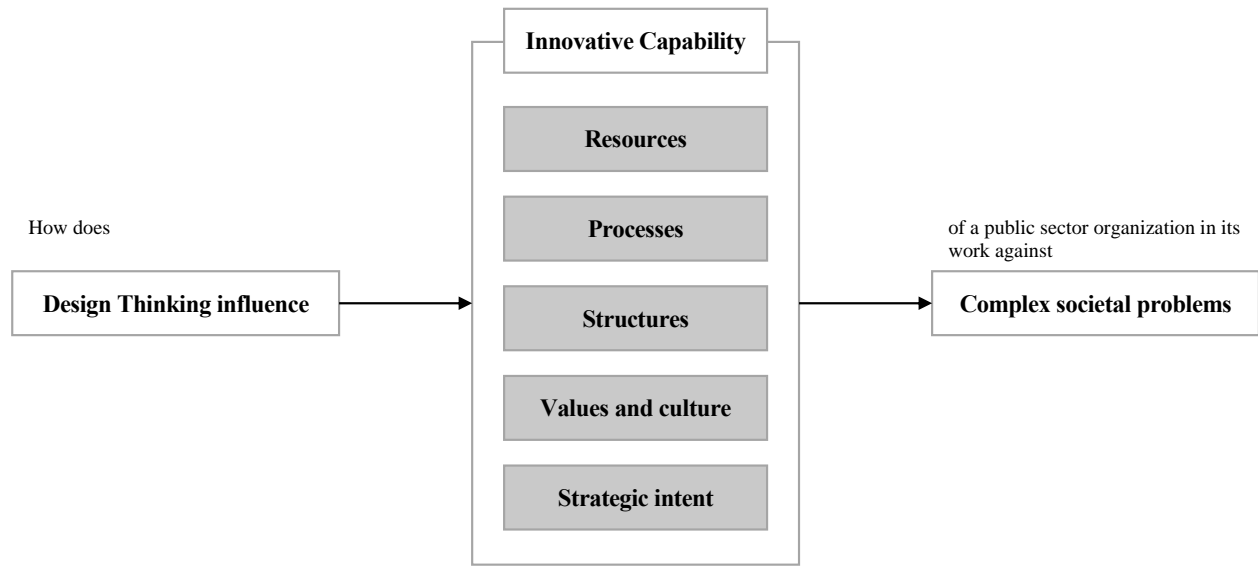
Explanation

Determinant of an organization's Innovative Capability

Figure 3. Theoretical framework (inspired by the summary of earlier works within the literature concerning Innovative Capability determinants depicted in Figure 2 and 3, and which are based on the works by Björkdahl & Börjesson (2012), Carlgren et al. (2014), Iddris (2016), Lawson & Samson (2001), Mendoza- Silva (2021), and O'Connor (2008))

3 Methodology

In the following chapter, the Research Approach is firstly presented (3.1), which is subsequently followed by the Research Process (3.2). Lastly, the study´s quality is discussed and assessed (3.3).

3.1 Research Approach

3.1.1 Methodological Fit

This study was conducted with an exploratory purpose by collecting preliminary data, intending to develop new findings and help set the direction for future research (Makri & Neely, 2021). In accordance with Yin's (2003) recommendations, a qualitative approach was taken, as it is suitable for examining themes in a partially uncharted, ambiguous research domain. Additionally, exploratory research with the nature of a "how" question often calls for the use of a qualitative approach rather than a quantitative one (Silverman, 2010), and areas of limited research may meet challenges in collecting enough applicable data to use a quantitative approach (Eisenhardt, 1989). Given that the performative perspective of DT as well as the field of IC, both within a public sector context, are relatively unexplored research areas, the study's primary goal was not to test existing theory (Bendassolli, 2013), as the study instead aimed to develop an increased understanding of how an organization´s IC within the public sector context, is influenced by DT.

The case study approach has previously been adopted in topics related to IC, such as how it can be used to understand innovativeness within organizations in the business context and, more recently, as a concept to understand innovativeness in the public sector domain (Gullmark, 2021). Other researchers in the field of DT have also argued for a case study approach in exploratory studies (Carlgren, 2013; Carlgren et al., 2014; Patricio et al., 2021). However, although the qualitative research and the case approach can generate deep insights, it has implicit defects, such as a limited sample size which decreases the likelihood of delivering more tangible and generalizable results (Adams, 2015; Dubois & Gadde, 2002; Yin, 2014). However, Bell et al. (2019) explain that the goal of qualitative research is to generalize to theory, not to population, and the quality of the study should be assessed based on the theoretical inferences made from the empirical data.

3.1.2 Research Design

Our research approach employs an iterative process involving continuous interaction between the framework, empirical evidence, and analysis. Dubois & Gadde (2002) argued that in-depth case studies call for a systematic combining process. The systematic combining process involves a nonlinear matching process, wherein the framework, empirical fieldwork, and case analysis are collectively developed. Abductive research refers to the process "by which a researcher moves between induction and deduction while practicing the constant comparative method" (Suddaby, 2006, p. 639) and is also ideal for discovering and formulating new concepts (Merriam, 1998; Flick, 2014). Therefore, the study contend that a similar systematic combining approach rooted in the abductive approach is appropriate to enable theory-building through engaging with the insights gathered in interviews (Charmaz, 2009) for examining how DT influences the IC of an organization within the public sector.

To gain insight into the organizational reality and the subjective interpretation of it by its employees, the epistemological position adopted can be described as interpretivism (Bell et al., 2019). As our research aims to explore the subjective experiences and interpretations of a public sector organization within the law enforcement context and how DT affects their IC, the study is, therefore, aimed to comprehend both the organizational reality and its employee´s interpretation of it (Bell et al., 2019).

3.1.3 Research Case

DT and IC within the public sector make for a particularly interesting context as it is still a nascent research field, and particularly the Swedish Police Force caught the authors´ interest. This organization was deemed suitable because in 2021, a selection of employees underwent training in Security Design to work with the method against complex problems. This training, *Introduction to Security Design and Innovation,* was provided by Cordillera Applications Group, Inc, a course specifically created for the context of security and law enforcement (see Appendix A for course description). The description of the methodology, as presented by Cordillera Applications Group, Inc (2021), closely resembles the description of DT presented by Kelley and Littman (2001), even though details have been altered to fit into the law enforcement context. Thus, the course can be seen as a course in DT but adapted to fit into the context of law enforcement, which supports the view of the study that the Police Force has undergone training in DT.

Additionally, this particular organization was recognized to be suitable as organized crime, which can be seen as a wicked problem (Rittel & Webber, 1973), is currently an extensive problem in Sweden (Polismyndigheten, 2022a; Polismyndigheten, 2022b), for which DT has been argued to be an applicable tool against (Buchanan et al., 2012; Hobday et al., 2012). This allowed us to deep-dive into a real-life, complex, and ambiguous situation that challenged existing ways of working and allowed us to understand how DT influences IC within a public sector organization.

3.2 Research Process

Our initial process involved developing a relevant theoretical framework with the basis of existing research in IC and selecting the case organization. Following this, the authors decided to focus on two groups within the organization, one group who had no experience working with DT (hereafter referred to as the Inexperienced) and one group who had experience working with DT regardless of DT training or having worked with the method.

An interview guide following a semi-structured approach was constructed to examine how the groups worked with innovation. Employees from various hierarchical levels and departments were interviewed to allow for a holistic perspective. When deemed relevant, follow-up interviews were done to clarify certain statements or facts. The interview guide operationalized the theoretical framework by connecting the IC determinants to specific questions (see Appendix B). After having conducted initial interviews, variations between interviewees who had undergone training in DT, and those who had not undergone training but worked with DT, emerged, leading us to the assumption that this could be a potential variable of high exploratory value. An interest in investigating this further was developed, and the study, staying true to its abductive logic, added a third group to respond to the insight into these potential variations. The third group comprised of those who had undergone training in DT (hereafter referred to as the Trained). In consequence, the authors changed the explanation of those who had not undergone training in DT but worked with DT (hereafter referred to as the Explorers), allowing us to compare and contrast the experiences of individuals who had undergone training versus those who had not, and to maximize comparability between the groups.

Once the data set was complete, the theoretical IC framework was used to analyze the empirical evidence, identifying key dimensions and patterns in the process and methods used to become innovative within the organization. A summary of the research process is visualized in Figure 4.

Outline of the authors theoretical framework	→	Selection of groups within the case organization	→	Colletion of data through semi-structured interviews

Triangulate using secondary sources and follow-up interviews	→	Identification of common themes within the case study	→	Use of the authors theoretical framework to analyze empiricial evidence and allow theoretical development

Figure 4: Visualization of the Research Process Outline

3.2.1 Data collection

3.2.1.1 Interview sample

In deciding what interview subjects to include, the study aimed to capture a diverse range of perspectives by interviewing employees from various work areas within the organization. Therefore, the study employed *a priori purposive sampling* when selecting interviewees for our study, meaning that criteria for inclusion were established at the off-set, with relevance to the area studied (Bell et al., 2019). The criteria for inclusion in the study were based on (i) working in the Swedish Police Force; (ii) having experience with DT, either through training, working with the methodology, or having no prior exposure to DT, and (iii) represent a diverse sample of the organization (see list of interview subjects in Appendix C).

However, the decision on the number of interviews for the research study was not predetermined. Instead, the study relied on the principle of theoretical saturation to guide the total number of interviews (Bell et al., 2019), meaning that sampling continued until relevant conceptual dimensions were developed, relationships accounted for, and when new insights no longer seemed to be emerging (Strauss & Corbin, 1998). After conducting 18 interviews, no new insights emerged, making the authors confident that theoretical saturation had been established. However, three follow-up interviews were conducted, one from each interview group, to guarantee that saturation had been achieved, ensuring that all themes had been thoroughly explored (Crouch & McKenzie, 2006).

3.2.1.2 Interview Design

For this study, the authors conducted interviews using the semi-structured approach, frequently used in qualitative studies (Merriam, 1998), and using open-ended questions to facilitate different perspectives (Bell et al., 2019). The interviews lasted 45-60 minutes and were focused on several key themes aimed at comprehending different aspects of IC within the organization. Consequently, the choice of a semi-structured approach allowed for shifting discussions and the flexibility to ask follow-up questions (Bell et al., 2019). To ensure that the analysis was an ongoing part of the research process and to establish trust between the interviewer and interviewee, the study followed Rubin & Rubin´s (2005) responsive interviewing model, which incorporates the concept of systematic combining, and entails a willingness to understand the point of view of the person through a collaborative conversation. Therefore, one researcher conducted the interview, while the other was responsible for taking notes. To minimize the risk of bias, the authors alternated roles during the interview, allowing both authors to intervene in the conversation if necessary (Mills et al., 2010).

Additionally, throughout the data collection process, the authors continuously adapted and reviewed the interview guide to ensure the relevance and effectiveness of the questions. This approach allowed us to remain aligned with our research approach and enhance the suitability of the questions for each interviewee (Rubin & Rubin, 2005).

3.2.1.3 Data considerations

All interviews were held online since many participants operated in different parts of Sweden. Thus it was challenging to conduct in-person interviews. To ensure a reliable method of communication, the Microsoft Teams conferencing tool was used for the interviews. The authors have, throughout the study, considered ethical implications to ensure the dependability and authenticity of the study (Bell et al., 2019). This consideration means that all respondents were asked for their consent to participate in the study and to be recorded for the purpose of transcription while being assured that transcripts were treated with confidentiality (Bell et al., 2019). The interviews were recorded to allow the authors to return to the recordings throughout the research process to ensure that everything was correctly understood. Furthermore, all interviews were conducted in Swedish to ensure that every aspect of the conversations was accurately captured. This decision could cause translation issues in direct quotations, but it was considered necessary

as language barriers could have resulted in miscommunication (Felderman & Hielb, 2020). All transcriptions, notes, and recordings were permanently erased after the study was finalized, all following procedures of GDPR.

3.2.1.4 Data processing

The 21 interviews conducted resulted in more than 220 transcribed pages. Although time-consuming, transcribing was crucial in enabling a comprehensive analysis of the interviewees' responses while identifying insights that may have been missed while conducting the interviews. Maintaining a continuously updated interview guide to the latest gained insights was also important. Additionally, to avoid piling up the data, interviews were transcribed within 48 hours and sent out to interviewees to ensure that everything was correct and that the interviewers misunderstood nothing.

The data processing tool Quirkos was used to make sense of the data from the interviews. After that, the authors engaged in an ongoing process of reasoning, moving between data analysis and theory development, where coding of emerging themes and analysis of data was deployed (Glaser & Strauss, 1967). Drawing inspiration from the Gioia method, a grounded theory approach was used to generate initial data codes from all transcripts (Gioia et al., 2013), and the process consisted of the construction of first-order concepts and second-order themes, which were done independently by the authors, reducing the risk of bias, and allowing triangulation of insights. The first-order concepts adhered to informant terms, meaning the number of categories was extensive. As Gioia (2004) mentions, the number of categories in this stage can be vast, but this was an essential first step in the coding analysis. This approach was meant to be intuitive as the aim of the study was to, through an explorative approach, understand how DT influences a public sector organization's IC. As there were three interview groups, Trained, Explorers, and Inexperienced, coding was done separately, using the same coding scheme across the three groups through a bottom-up approach to later, enable comparisons. The identified second-order themes between the two authors were then consolidated into third-order dimensions, relating emerging themes to one another, with the authors acting as knowledgeable agents (Gioia et al., 2013). As abductive reasoning was employed, this allowed the authors to cycle back and forth between data collection, data processing, and review of relevant literature (Eisenhardt, 1989). The insights from the coding process resulted in six third-order dimensions common for all groups: *Key resources, Resource*

space, Solution space, Critique, Organizational structure, and *Prevailing culture.* Insights from the coding process also resulted in four third-order dimensions that were only observed among the Explorers and Trained: P*roblem understanding, Problem-solving tools,* and *The need for change* in both *Processes* and *Structures.* Ultimately, insights from the coding process resulted two third-order dimensions that were only observed among the Trained: *The need for change* in *Resources* and *Future culture.*

Lastly, the insights and identified third-order dimensions from the coding process were analyzed against the study's theoretical framework to allow for theory development. The identified third-order dimensions were connected to four of the five determinants in the theoretical framework: *Resources, Structures, Processes, and Values and Culture.* No third-order dimensions emerged connected to the IC determinant *Strategic intent*; thus, it is not discussed further in the Empirics or Analysis. Additionally, the identified third-order dimension *Organizational structure* was similar in all groups. It was, therefore, merged with *Critique* in the Empirics, creating the section *Organizational structures and critique against them* (4.3.1). The third-order dimension *Prevailing culture* was also similar in all groups. It was, therefore, merged with the dimension Future culture in the Empirics, creating the section the dimension The prevailing culture and Future culture as described by the trained (4.4). The coding process of each group is visually illustrated in Figures 5, 6 and 7.
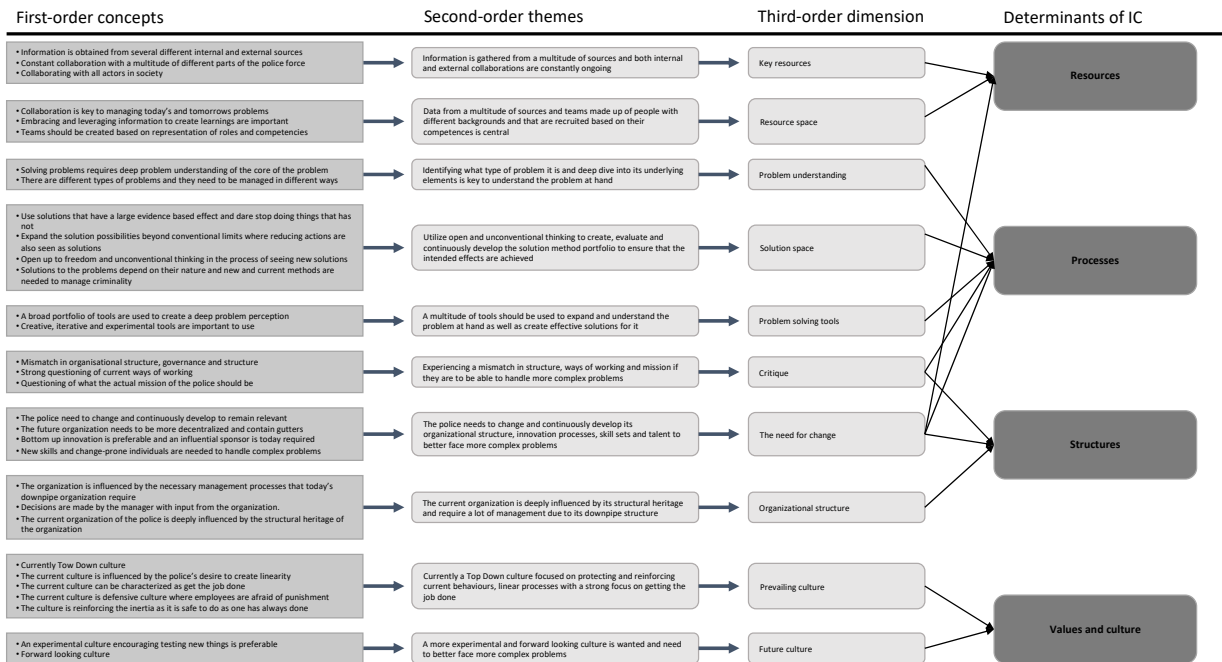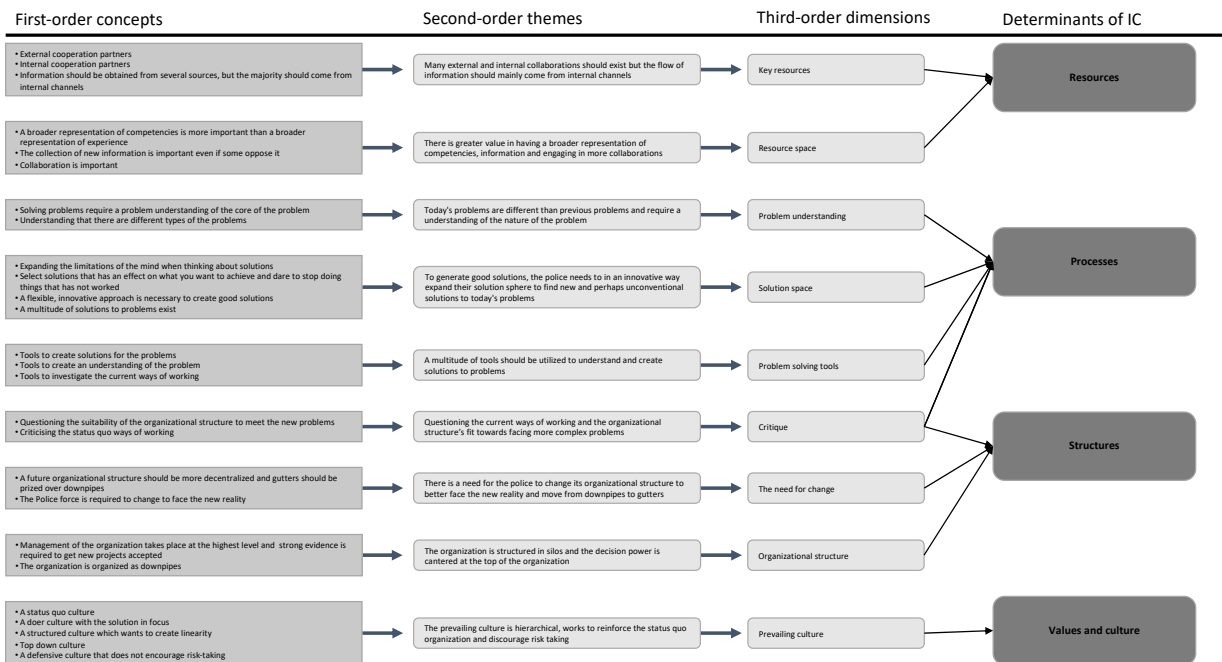
Figure 5: Thematic coding process of the Trained

First-order concepts	Second-order themes	Third-order dimension	Determinants of IC
• Information is obtained from several different internal and external sources • Constant collaboration with a multitude of different parts of the police force • Collaborating with all actors in society	Information is gathered from a multitude of sources and both internal and external collaborations are constantly ongoing	Key resources	**Resources**
• Collaboration is key to managing today's and tomorrows problems • Embracing and leveraging information to create learnings are important • Teams should be created based on representation of roles and competencies	Data from a multitude of sources and teams made up of people with different backgrounds and that are recruited based on their competences is central	Resource space	
• Solving problems requires deep problem understanding of the core of the problem • There are different types of problems and they need to be managed in different ways	Identifying what type of problem it is and deep dive into its underlying elements is key to understand the problem at hand	Problem understanding	**Processes**
• Use solutions that have a large evidence based effect and dare stop doing things that has not • Expand the solution possibilities beyond conventional limits where reducing actions are also seen as solutions • Open up to freedom and unconventional thinking in the process of seeing new solutions • Solutions to the problems depend on their nature and new and current methods are needed to manage criminality	Utilize open and unconventional thinking to create, evaluate and continuously develop the solution method portfolio to ensure that the intended effects are achieved	Solution space	
• A broad portfolio of tools are used to create a deep problem perception • Creative, iterative and experimental tools are important to use	A multitude of tools should be used to expand and understand the problem at hand as well as create effective solutions for it	Problem solving tools	
• Mismatch in organisational structure, governance and structure • Strong questioning of current ways of working • Questioning of what the actual mission of the police should be	Experiencing a mismatch in structure, ways of working and mission if they are to be able to handle more complex problems	Critique	**Structures**
• The police need to change and continuously develop to remain relevant • The future organization needs to be more decentralized and contain gutters • Bottom up innovation is preferable and an influential sponsor is today required • New skills and change-prone individuals are needed to handle complex problems	The police needs to change and continuously develop its organizational structure, innovation processes, skill sets and talent to better face more complex problems	The need for change	
• The organization is influenced by the necessary management processes that today's downpipe organization require • Decisions are made by the manager with input from the organization. • The current organization of the police is deeply influenced by the structural heritage of the organization	The current organization is deeply influenced by its structural heritage and require a lot of management due to its downpipe structure	Organizational structure	
• Currently Tow Down culture • The current culture is influenced by the police's desire to create linearity • The current culture can be characterized as get the job done • The current culture is defensive culture where employees are afraid of punishment • The culture is reinforcing the inertia as it is safe to do as one has always done	Currently a Top Down culture focused on protecting and reinforcing current behaviours, linear processes with a strong focus on getting the job done	Prevailing culture	**Values and culture**
• An experimental culture encouraging testing new things is preferable • Forward looking culture	A more experimental and forward looking culture is wanted and need to better face more complex problems	Future culture	

Figure 5: Thematic coding process of the Trained

Figure 6: Thematic coding process of the Explorers

First-order concepts	Second-order themes	Third-order dimensions	Determinants of IC
• External cooperation partners • Internal cooperation partners • Information should be obtained from several sources, but the majority should come from internal channels	Many external and internal collaborations should exist but the flow of information should mainly come from internal channels	Key resources	**Resources**
• A broader representation of competencies is more important than a broader representation of experience • The collection of new information is important even if some oppose it • Collaboration is important	There is greater value in having a broader representation of competencies, information and engaging in more collaborations	Resource space	
• Solving problems require a problem understanding of the core of the problem • Understanding that there are different types of the problems	Today's problems are different than previous problems and require a understanding of the nature of the problem	Problem understanding	**Processes**
• Expanding the limitations of the mind when thinking about solutions • Select solutions that has an effect on what you want to achieve and dare to stop doing things that has not worked • A flexible, innovative approach is necessary to create good solutions • A multitude of solutions to problems exist	To generate good solutions, the police needs to in an innovative way expand their solution sphere to find new and perhaps unconventional solutions to today's problems	Solution space	
• Tools to create solutions for the problems • Tools to create an understanding of the problem • Tools to investigate the current ways of working	A multitude of tools should be utilized to understand and create solutions to problems	Problem solving tools	
• Questioning the suitability of the organizational structure to meet the new problems • Criticising the status quo ways of working	Questioning the current ways of working and the organizational structure's fit towards facing more complex problems	Critique	**Structures**
• A future organizational structure should be more decentralized and gutters should be prized over downpipes • The Police force is required to change to face the new reality	There is a need for the police to change its organizational structure to better face the new reality and move from downpipes to gutters	The need for change	
• Management of the organization takes place at the highest level and strong evidence is required to get new projects accepted • The organization is organized as downpipes	The organization is structured in silos and the decision power is cantered at the top of the organization	Organizational structure	
• A status quo culture • A doer culture with the solution in focus • A structured culture which wants to create linearity • Top down culture • A defensive culture that does not encourage risk-taking	The prevailing culture is hierarchical, works to reinforce the status quo organization and discourage risk taking	Prevailing culture	**Values and culture**

Figure 6: Thematic coding process of the Explorers

First-order concepts	Second-order themes	Third-order dimension	Determinants of IC

- Informational gathering is predominantly done internally and builds on previous experiences and earlier work
- Collaborations are run internally on all levels
- External collaborations are run with multiple actors but predominantly with actors located within the public domain

Information is mainly gathered internally although collaborations are done with all of societies actors but mostly with other public organizations

Key resources

Resources

- Collaboration is important but require a common goal as its foundation
- Information can be gathered from multiple sources
- Experience is a key factor when recruiting and creating teams

Collaboration when the goals are aligned is important, information should be gathered from multiple sources and these efforts should be led by teams recruited based on long experience

Resource space

- Traditional leadership and resource solutions dominate the ways in which the police handles problems
- We should do more of what we are already doing today to solve the problems that we are facing

A traditional approach to problem solving is favoured where doing more of what is already being done is seen as the way to achieve better results

Solution space

Processes

- Questioning how effective the organization is
- Changes might be needed to the future organizational structure

Questioning how effective their current ways of working are and if changes to the organizational structure would be beneficial

Critique

Structures

- The organization is built to cater to the management of the linear processes
- The highest ranking officer leads and can intervene on all levels
- Innovation is steaming from top-down, bottom-up processes
- The strategic management is highly influenced by politicians

A hierarchical and very structured organization where innovation can stem from anywhere and that is lead from the top which is influenced by politicians

Organizational structure

- Top Down culture
- Want to do it as it has always been done
- Get the job done culture
- Defensive culture highlighting that the Police are experts on what they do

A status quo culture is prevailing which reinforces current structures and linear ways of working where little room is left for debate

Prevailing culture

Values and culture

Figure 7: Thematic coding process of the Inexperienced

3.3 Data quality

This study's quality was deemed important, as it sought to develop and expand research in the theoretical fields of DT and IC. To ensure trustworthiness, this study followed the criteria proposed by Lincoln and Guba (1985), which include credibility, transferability, dependability, and confirmability, which are specially adapted for qualitative research, as the quantitative research criteria have been argued to be less suitable for qualitative research.

3.3.1 Credibility

Credibility looks at how believable the study's findings are and can also be referred to as internal validity in a quantitative study (Bell et al., 2019). It relates to ensuring that the analysis correctly depicts a tenable interpretation of data and interviewees' perspectives. This means the study was conducted through good practice while confirming with the participating interviewees that the researchers had understood their social world correctly. Credibility in this study was ensured through several measures. Firstly, triangulation was used by the authors to draw conclusions independently, thus, eliminating biases from the process. Secondly, member checks were conducted by sharing our conclusions with interviewees to ensure the authors' interpretation accurately reflected their thoughts (Bell et al., 2019. Lastly, credibility was strengthened by deploying systematic combining as a matching technique (Rubin & Rubin, 2005).

3.3.2 Transferability

The transferability of a qualitative study is concerned with external validity, meaning the extent to which the findings are transferable to other contexts (Bell et al. 2019: Guba & Lincoln, 1985). Qualitative research is concerned with generating deep knowledge and contextual uniqueness in a case-study approach and achieving transferability. Lincoln and Guba (1985) argue that it is important to produce thick descriptions, which has been achieved in this study by thoroughly providing information about the research process, case study selection, interview guide, and description of DT training for the organization, to allow future researchers seeking to transfer the applicability of our findings to their context.

3.3.3 Dependability

Dependability, which parallels reliability in quantitative studies, is concerned with whether the study's findings can remain valid at other times and if other researchers can test it to be repeatable and dependable (Lincoln & Guba, 1985). To address this, the study has provided a detailed account of its research design and process, as well as the appendices included, which allows future readers and researchers to evaluate and decide if proper research has been conducted (Shenton, 2004). Additionally, external audits were conducted by presenting the findings of this study to the study´s supervisor and the author´s colleagues, enabling triangulation of the findings. By using triangulation of the findings among the external audits, the study sought to stress test the results and reinforce robustness (Lincoln & Guba, 1985). The data considerations in this study have also helped to increase dependability.

3.3.4 Confirmability

Confirmability, paralleling objectivity in quantitative studies, is concerned with the study's neutrality, limiting personal biases from affecting the integrity of the study and whether the study's findings can be confirmed by other researchers (Lincoln & Guba, 1985). To ensure confirmability, the authors´ were thorough and transparent in describing the theoretical, methodological, and analytical choices throughout the process (Bell et al., 2019). Additionally, a structured interview guide for the questions was used to mitigate the risk of subjectivity and questions influencing the respondents, as suggested by Yin (2014).

4 Empirical findings

In this section, the main empirical findings from the interviews are presented. Firstly, the findings related to the determinant Resources are presented from each group (4.1). Secondly, the findings related to the determinant Processes are presented from each group (4.2). Thirdly, the findings related to the determinant Structures are presented from each group (4.3). Lastly, the findings related to the determinant Values and Culture are presented from each group (4.4). What each group said concerning the different determinants are presented using quotes from selected interviewees to substantiate the findings. All of the identified third-order dimensions, for each sample group, as well as their connection to the determinants of an organization's IC are depicted in Figure 8.

Sample groups within the Swedish Police Force		
Trained	**Explorers**	**Inexperienced**

	Trained	**Explorers**	**Inexperienced**
Resources	Key resources / Resource space / The need for change	Key resources / Resource space	Key resources / Resource space
Processes	Problem understanding / Solution space / Problem solving tools / Critique / The need for change	Problem understanding / Solution space / Problem solving tools / Critique	Solution space
Structures	Organizational structure / Critique / The need for change	Organizational structure / Critique / The need for change	Organizational structure / Critique
Values and culture	Prevailing culture / Future culture	Prevailing culture	Prevailing culture

(Left axis: Determinants of an organization's Innovative Capability)

Explanation

☐ Determinant of an organization's Innovative Capability

Figure 8. Overview of the identified third-order dimensions in each sample group and how they are connected to the determinants of an organization's Innovative Capability

4.1 Resources

4.1.1 Key Resources

Key resources as described by the Inexperienced

The Inexperienced described information and knowledge as important resources for managing complex problems. Several interviewees acknowledged the importance of learning more about the issue and, from that, choosing the appropriate method to deal with it. Members of this group stressed that the majority of the information that they used was internally generated, and when that proved insufficient, they turned to internal experts. According to the Inexperienced, the primary purpose of information gathering was to consolidate what was already known internally. To illustrate this, one interviewee described the internal information-gathering process as follows:

"We always work with internal groups of experts and different kinds of regional reference groups where we discuss different topics and synchronize our thinking. Beyond this, we also utilize a lot of internally accessible data" (Interview 20)

It became, during the interviewees, apparent that a significant portion of the internal information utilized among the Inexperienced to facilitate projects was based on either the individual or collective experience of the Police Force. The interviewees referred to these experienced individuals as internal experts and considered them valuable information sources that could lead to innovation. The favoritism for internal or known collaborating partners was also shared by several interviewees, meaning that the group favored collaborating with partners they already knew and who had experiences similar situations as themselves. Thus, it was natural that most of the collaborations described were with other governmental agencies.

Key resources as described by the Explorers

Among the Explorers, there was a similar understanding that collaborations within the organization and between departments to share information on all levels were critical. Interviewees stated that the organization had come far when sharing internal information, especially "between the intelligence and investigation units" (Interview 12). The same interviewee also said:

"We work actively in a different way, not least that we combine our national resources and work together. We have a problem picture for which we are prepared to take national responsibility"

(Interview 12)

However, several interviewees among the Explorers also recognized the importance of broadening the scope to external collaboration partners and not solely relying on internal collaborations. One interviewee described that the external collaborations before mainly were about local issues, but that they now needed to collaborate on multiple levels with external partners to be able to better face more complex problems (Interview 7).

Key resources as described by the Trained

In contrast to the two other groups, interviewees among the Explorers highlighted that they utilized a broad category of resources in their problem-solving process, with collaborations and information being the most crucial. They emphasized that information needed to be collected from not only internal sources but from many external sources as well, stretching to both traditional and non-traditional sources, thus broadening their information resources to involve more resources than was described among the Inexperienced and the Explorers.

"In this case, we went out into society and asked questions; in other words conducted interviews. We know that the majority of the deadly violence happens in the suburbs and that then discuss this with a wide variety of people. In other words, young women in the suburbs that have a connection to someone that is involved in the problem, mothers, local Police, social workers, and a wide variety of people to gain better information. Ask our societal members what they think to a greater extent and not only the experts because they live in this and thus know the problem better than anyone. This was extremely valuable because it gave us many new perspectives and new types of information." (Interview 3)

In line with the description from the Explorers, interviewees among the Trained also described a broad base of internal and external stakeholders with whom they collaborated continuously or occasionally with. To exemplify, this group engaged in collaboration with other governmental agencies (Interview 3), NGOs (Interview 15), the business world (Interview 13), the civil society (Interview 19), and universities (Interview 5), among others.

4.1.2 Resource space

Resource space as described by the Inexperienced

The Inexperienced emphasized several resources to be of importance when working with complex problems, and the group acknowledged collaborations, information, and the accumulated expertise within the team to be of importance. However, for collaborations to work effectively, they needed to have a shared goal and shared benefits among the collaborators, as one interviewee stated:

"Corporation and collaborations are built upon a common foundation, where we are heading together" (Interview 10)

Among the Inexperienced, another common theme regarding resource space was the importance of experience in selecting team members and addressing complex problems. One interview described it as tacit knowledge or what internally was known as "authority with the profession" (Interview 11). The same interviewee went on to explain why this was the case, where the interviewee pointed to the lack of documentation within the Police Force, leading to the importance of experience.

Resource space as described by the Explorers

Among the Explorers, interviewees also emphasized the need for several resources, similar to the Inexperienced, but also stressed the need for many different competencies in a team suited to handle complex problems. Thus, acknowledging the importance of the team constellation. One interviewee described it as:

"So you can put together the right components, like IT-forensics should be involved, child interrogators, the border Police, but also external partners could be included as well in a team as it all depends on what you need" (Interview 7)

Another interviewee among the Explorers also described the same phenomena when discussing recruitment. The interviewee highlighted that they needed to start looking not only at experience but also for the right competencies (Interview 6). This was connected to how recruiting should be done within the Police Force and that the organization needed to perhaps rethink their recruitment and not only look for experience but also start looking for other qualities as well to enhance their internal resource base:

"Who gets into the Police academy and things like that? Moreover, it's hard to get in if you're in a wheelchair. But they can have good qualities, so it has to do with new Police officers who will join. I don't see that we need to increase our intervention capabilities within the organization"

(Interview 8)

Furthermore, interviewees emphasized the value of engaging in multiple collaborations with stakeholders to work more proactively in crime prevention in terms of resource space. One interviewee explained this by suggesting that the Police Force might not always be the first authority that should intervene when working in crime prevention (Interview 9). Thus, multiple and tight collaborations were deemed necessary to ensure that the appropriate governmental authority was activated and engaged at the right time.

Resource space as described by the Trained

In contrast to the Inexperienced and the Explorers, the Trained elaborated more on the concept of resource space. A shared theme among the interviewees in this group was the importance of information, preferably from a multitude of different sources, both internal and external, as described by one interviewee:

"Crime fighting needs to become information-centric by merging all of our currently separate information lakes and merging them into an information ocean. By doing this and putting layer on top of layer, we will be able to get a completely different comprehensive picture and, with that a revolutionary crime-fighting ability. It is of utmost importance that we can connect ourselves to all these small lakes and create this ocean." (Interview 14)

However, the interviewees also emphasized that solving these types of problems could not be achieved in isolation, as it needed to be done in collaboration with several different stakeholders, which was in line with what was said in the two other groups, who also stressed the value of collaboration. Collaboration was, consequently, considered necessary by all interviewees. However, interviewees among the Trained took it one step further and deemed it crucially necessary.

Another critical factor in increasing the amount of vital information to be used in the process, except for more and closer collaborations with stakeholders, was to rethink the composition of teams. Several interviewees among the Trained realized that the best teams for tackling complex problems were those with diverse backgrounds and competencies, similar to what was described by the Explorers.

"The most advantageous projects that I have been a part of have been the teams with diverse backgrounds, people from different governmental agencies, countries, professions, and different ages. This type of constellation has been very advantageous in achieving diverse thinking and, in the end, interesting and impactful solutions." (Interview 15)

This mindset resulted in the interviewees rethinking recruitment strategies and shifting from prioritizing experience to "personal competencies and personal approaches to the work" as described in Interview 19, which was in line with the thinking among the Explorers.

4.1.3 The need for change

The need for change as described by the Trained

During the interviews, the Trained was the only group to discuss the need for change regarding any primary resources. Several interviewees emphasized the importance of fostering innovation, not just from significant top-led innovative projects but also from employees' day-to-day work at all levels. To enable this transition, interviewees among the Trained expressed that the Police Force needed to attract and recruit new competencies, as was described by several interviewees. The group repeatedly stressed the need for change-prone employees, with different backgrounds and expertise, with a collaborative and change-prone mindset. An essential part of achieving this was to change the human capital base, described by one interviewee as follows:

"But the most important thing is the mindset that we play this game together. We usually put it as it is easy to be good in your own box, but we look for those who can both be good in their own box but also succeed in the borderlines where being good is much harder. The reason why we look for these types of employees is because we want to build gutters to enable more collaboration. It is key. We need to expand and change our employee base to incorporate more individuals like this" (Interview 19)

4.2 Processes

4.2.1 Problem understanding

Problem understanding as described by the Explorers

As no dimension concerning problem understanding was identified among the Inexperienced, this section starts with presenting the findings from the Explorers, where problem understanding was a common theme. In this group, an understanding of the elements of the problems was argued to be necessary to be able to solve them. This point was mainly argued because of the expressed understanding that different types of problems existed and that these, because of their differences, needed to be looked upon differently to be solved. As one interviewee described it:

"We have to deal with structured problems, but we also have to understand that there are problems that are not structured and that we have to test our way forward, that they are two different things." (Interview 7)

Furthermore, having a solid understanding of the problem was crucial not only for solving problems but also for solving problems effectively, thus avoiding potential pitfalls. One interviewee shared an example:

"We have a village outside here called Boliden. There they had a problem with crime, and so they created two Police officers who would work against that over time. However, the problem was that it was not really that there was a problem with crime, but it was cheap housing where addicts had moved there, and then when the police started to come, they moved away. And then problems disappeared, so the problem was just like Kalle, Anders, and Bengt. It is not their names, but it was them who were the problem, not that there was a crime in society and had we used a slightly smarter method, it does not have to be as advanced as that, but if you had been a little more analytical and not just went on." (Interview 6)

Problem understanding as described by the Trained

Like the Explorers, the Trained also emphasized the significance of problem understanding. They regarded the process of investigating the problem as a critical step when dealing with complex problems, which led them to spend much time on it:

"We experienced that, from my viewpoint, that the comprehension of the problem, that we are putting more effort into this. We felt this was key to move forward." (Interview 2)

The aim was to understand the core problems of the focal problem to be solved since they historically felt that they often had started with the wrong problem in mind, resulting in ineffective processes and solutions, which the Explorers also described. However, it was not only the understanding of the focal problem that was viewed as critical. Understanding what type of focal problem it was, was also similar to the Explorers, observed as important. This was described to be because they believed that different problems required different solutions, and thus understanding the focal problem's type was also necessary to start working on solutions for it, or as one of the interviewees put it:

"I see it as there are a lot of challenges that are simple in their nature and other challenges that are more complex in their nature. Moreover, I believe that we should not say that all things are complex for the sake of it, but the challenges that are complex must be handled as if they are complex. But on the other hand, challenges that are not complex should not be moved to that category because I believe that we do ourselves a great disservice if we do that." (Interview 3)

4.2.2 Solution space

Solution space as described by the Inexperienced

When faced with complex problems or "problems they were not accustomed to" (Interview 18), several interviewees among the Inexperienced highlighted that the Police Force's preferred way of dealing with these types of problems was to do it through established methods. One of their preferred and most used methods was a method where they changed the leadership structure, called "special event" (Interview 11), which was described to be superior because it freed up more resources as it got a higher priority internally:

"When we experience something that we feel we can not handle within the current leadership structures, in an efficient way, we start a special event. The effect of this is that we put a unique resource on that problem on top of the ordinary resource to solve the problem. The aim is to catch up so that the ordinary resource is able to manage the problem on its own again"

(Interview 11)

The emphasis among the Inexperienced was that complex problems were solved using traditional and well-used methods, which almost always involved more resources (Police Officers). If it was a tough one, they just added more since that ought to solve it (Interview 10).

Solution space as described by the Explorers

Compared to the Inexperienced, the Explorers differed in their view regarding what constituted effective solutions to complex problems. Rather than relying on established solutions, they emphasized the importance of problem understanding, as earlier described, and that not all problems could be solved since they were complex. They highlighted that these problems, because of their nature, required different solutions compared to common problems, which could be solved using more resources. One interviewee compared this logic to a football game:

"A complex problem is something where there is not a simple one; there is not really a solution. It is not like a football match when you know that after 90 minutes, it is over. It is either a win or a draw or a loss; there are clear rules. A complex problem, there are no rules anywhere, but it is something that if you think you can solve it, then you are wrong because there is no real solution. There is a way to limit the problem, maybe reduce it, but there is not a silver bullet."

(Interview 12)

Derived from this understanding, the Explorers, compared to the Inexperienced, stressed that the Police Force, thus, needed to take a broader approach to find suitable solutions to these problems. Simply repeating the same methods that had no effect was not enough. Therefore, they argued that the Police Force, moving forward, "needed to dare to stop doing things that had no impact on these problems and instead broaden their viewpoint to find new and more applicable solutions", as described by Interview 21.

Solution space as described by the Trained

In their interviews, the Trained shared a similar approach to finding solutions, similar to the Explorers, with both groups deriving the solution thinking from a deep understanding of the problem. This led them to highlight the same mindset that some complex problems cannot be solved since they can be viewed as infinite problems for which perfect solutions do not exist, as described by one interviewee:

"Complex problems cannot be solved as an ordinary problem since it is an infinite game. This is not a problem which seems to exist by us coming up with a solution; instead, it is about learning to live with it and try to affect it instead in different ways that are plausible" (Interview 4)

This thinking, enabled by their deep problem understanding, made the interviewees, similar to the Explorers, see the need to expand their sphere of possible solutions and engage in thinking which allowed them to do this, described by one interviewee:

"Dare to think freely and then, as said and in line with Design Thinking, dare to think far outside the borders. Skip what is legal and what is not or inappropriate or appropriate and just broaden your perspective before at the end narrow it down again" (Interview 3)

The divergent and unconventional thinking approach, described by several interviewees, gave rise to them, similar to the Explorers, to start viewing and appreciating other types of solutions to the well-known ones preferred by the Inexperienced and see the importance of these perhaps unconventional ones. Examples of solutions brought up were "communication as a tool to instill fear" (Interview 19) and "economic accounting faults as that was what had got Alcapone" (Interview 3), among others. Moreover, preventative measures were also highlighted to be as important as other solutions as they were viewed by many as a valuable tool since they achieved the same end goal, less crime. Thus, the view presented by this group was that the Police Force

needed to expand its solution sphere to find new solutions that affected complex problems, as also expressed by the Explorers. Moreover, to do this, they did not only need to expand their solutions sphere, but they also needed to better "evaluate solutions based on measured effect to ensure that the solutions that had an effect were used" (Interview 13). In connection to that, they also underscored the need to stop doing things that had no effect, even if they were old and tightly culturally incorporated methods, as was also highlighted by the Explorers. Thus, they expressed a need to rethink their solution portfolio and constantly update it based on the problem at hand.

"I believe that we need to become much braver and dare to discard solutions without supported effect, but also identify those with the biggest potential effect and expand them" (Interview 14)

4.2.3 Problem solving tools

Problem solving tools as described by the Explorers

As no dimension concerning problem-solving tools was identified among the Inexperienced, this section starts with presenting the findings among the Explorers, where the usage of tools in the problem-understanding process and solution-generating processes were brought up in several interviews. Some tools that were discussed during interviews for understanding the problem were Stakeholder analysis (Interview 9), Cynefin´s framework (Interview 7), Ethnographic research (Interview 12), Scenario analysis (Interview 9), and the Three Box-method (Interview 6). In the solution stage, the following tools were mentioned: Ideation (Interview 7) and Prototyping (Interview 12).

Problem solving tools as described by the Trained

Like the Explorers, the Trained also viewed using a wide variety of tools as necessary to facilitate the crucial problem-understanding and solution-creation process. Examples of tools brought up in the problem understanding phase by the Trained were: Vulnerability analysis (Interview 3), Ethnographic research (Interview 2), Cynefin's framework (Interview 15), and environmental monitoring (Interview 3), among others. To facilitate the solution creation stage, interviewees among the Trained mentioned several creative tools such as Brainstorming (Interview 19), Ideation (Interview 17), and Prototyping (Interview 4), among others. The message conveyed by the Trained was that they utilized a wide variety of tools to facilitate their creative and iterative process of trial and error while working with complex problems.

4.2.4 Critique

Critique as viewed by the Explorers

As no dimension concerning critique against current processes was identified among the Inexperienced, this section starts with presenting the findings of the Explorers, where critique against the Police Force's general approach to managing complex problems and problems, in general, was a common theme. Several interviewees described that the currently used methods had low effectiveness and, at best, helped limit the symptoms of the problem, never solving or targeting the core of the problem. The methods, although inadequate, were nevertheless used due to the expressed inertia within the organization, in terms of methods, which was described to lead to the situation turning into an infinite game that constantly worsened. The frustration related to this was expressed by one interviewee as follows:

"You have not stepped forward and have not increased your security either. There is no effect on this? It is flooded, and we are scooping with a bucket, but we have not found the leak, nor have we had time to look for it because we are constantly scooping." (Interview 8)

Critique as viewed by the Trained

Like the Explorers, the interviewees among the Trained also presented an overarching theme of widespread critique against the status quo approach. The current methods used to manage complex problems were, similar to the Explorers, criticized together with the reinforcing mechanisms for these ways of working. The need for new methods and a broader dialogue about the currently used method's suitability was repeatedly raised to foster change.

"The problem with the new murders that have happened is that the Police have chosen to apply the traditional methods, approaches, ways of managing information, and decision processes to solve them even though they are not relevant. We need to start to challenge and question the approaches used within our culture and understand that we need to constantly evaluate them to ensure that effective measures are in place, and where we do not have effective approaches, we need to find new ones." (Interview 18)

4.2.5 The need for Change

The need for change as viewed by the Trained

Connected to the Trained´s broad criticism concerning how the Police Force currently worked with complex problems, described in 4.2.4, was the recognized need for change related to the Police Force's current ways of working. All interviewees among the Trained agreed that a fundamental shift was necessary not only in the processes but also in the mindset of the Police Force. The interviewees emphasized that the needed change was not only a one-time change of processes but also a shift in the mindset concerning processes to allow for a continuous change process that would enable the Police Force to constantly adapt and be ready for future challenges.

Actually, for real, base it on what is happening in the real world and the operational challenges we face today and realize that what we did yesterday is not good enough. We will need to do things differently and improve every day. We need to constantly develop and improve to better face what is happening in society. (Interview 14)

4.3 Structures

4.3.1 Organizational structures and critique of them

Organizational structures and critique of them as viewed by the Inexperienced

While most of the interviewees among the Inexperienced acknowledged that the current organization, described to be based on a downpipe structure, and approaches were good and served a purpose, the group also raised critique. The raised criticism primarily focused on two main areas: organizational effectiveness and the organization's fit to manage future problems. Although both issues were distinct, the group perceived them as interconnected as interviewees among the Inexperienced saw that the current organizational structure did not allow them to be fast enough to keep up with the rapid changes among criminals. The viewpoint, "we are currently working in downpipes, which is not very efficient" (Interview 11), was prevalent among the Inexperienced.

Organizational structures and critique of them as viewed by the Explorers

Like the Inexperienced, critique towards structures, especially the organizational structure, was also a reappearing theme among the Explorers, as it was perceived as too slow and inefficient to face complex problems. The problem was primarily related to their currently used downpipe structure, which limited information sharing and speed, resulting in an organization that produced solutions applicable to last year's problems this year. This was highlighted by one interviewee when he described how new internal courses were already outdated by the time they became available:

"We come in with new courses where the problem we are supposed to train against is about to change or has already changed. Especially on the technical side. We are too slow to react; our organization is too slow" (Interview 8)

Organizational structures and critique of them as viewed by the Trained

The Trained, like the Inexperienced and Explorers, were also critical of the current organizational structure, which was described similarly to the previous two groups. However, their analysis was further detailed and highlighted a structural mismatch between the organizational structure and the external demands. The notion of the "administrative monster", used to describe their organization, was used extensively to explain this phenomenon. It, together with the downpipe structure, was criticized for leading to less collaboration, low levels of information sharing, a grudging towards making decisions, slow processes, and an overall status quo-reinforcing organization, as described below:

"There is an inertia in that, which sometimes can be beneficial. We do not make hasty decisions, and in the best of worlds, we make better decisions due to this organization. However, it also functions as an enormous inertia in that all should have a say in everything within the Police, and in almost all questions, it is required that all regions and departments have the opportunity to provide input to the question. As you can imagine, this does not enable fast decisions and makes the overall system very slow. We only administrate." (Interview 2)

4.3.2 The need for change

The need for change as described by the Explorers

In terms of structures, no dimension regarding the need for change was identified among the Inexperienced. Therefore, this chapter starts with the findings from the Explorers, where several interviewees brought up the need for structural changes in the organization due to their skepticism regarding the current structure´s ability to manage complex problems since these problems put other demands on the organization. One of the suggested changes, proposed by several interviewees among the Explorers, was to delegate the decision-making authority downwards and thus allow for less executive presence and faster decision-making, as one interviewee stated:

"I think that would mean that you would need to have the opportunity to be able to gather around a problem, but also that you actually get a certain shift in mandate so that you also have room to work within this so that you are not so controlled by other things around you."

(Interview 9)

Another theme that emerged among the Explorers, connected to their earlier critique, was "to stop working in silos and instead venture out of them" (Interview 21). Lastly, the role of the sponsor, meaning the manager sponsoring the initiative, was also raised as a needed change since they felt it needed to have a more significant role in the current and future organizational structure. It was highlighted that sponsors were required to create legitimacy and trust for initiatives and thus that the function should gain more attention in the future organization (Interview 7).

The need for change as described by the Trained

Like the Explorers, the Trained also emphasized the need for changes in the organizational structures. The proposed change initiatives were based on their earlier described criticism and aimed at removing the structural mismatch to enable better management of complex problems by the organization, as described by one interviewee:

"I do not believe in the classical hierarchical organization – even though I have a lot of gold on my shoulders. I do not believe that hierarchical organization is the solution to all problems. Rather, we need to move away from hierarchies to platforms to networks, go from downpipes to tearing them apart, and instead work in gutters. I believe in the understanding that these are not limited problems that we are managing but instead complex problems that require a different type of leadership and structures" (Interview 14)

Multiple interviewees also touched upon, similar to the Explorers, the importance of the role of the sponsor in the current and future organization. It was described that initiative sponsors needed to take a more significant part in the current organization to shelter the otherwise exposed, innovative projects from the inertia culture. On the contrary, in the long term, when assumed changes to the organizational structure had taken place, the role was described to be less about sheltering initiatives and more as a sparring partner that helped to create the desired culture. One interviewee described the role of the sponsor in the future as:

"I think that quite a lot of the elements of leadership that are within sponsorship. I think in the role of sponsor, you create the conditions for this culture where you dare to test a lot of such things, and I also see it more as a sparring partner than as this decision-maker" (Interview 13)

4.4 Values and Culture

The prevailing culture and Future culture as described by the Trained

The Trained stood out among the three groups as they were the only group that extensively discussed the future culture of the organization, highlighting the need for a significant cultural shift, in addition to their description of the prevailing culture, which was described as a hierarchical, partially defensive, and status quo-reinforcing culture. The prevailing culture described by this group was identical to the other groups' description of the prevailing culture. When describing the future culture, several of the Trained interviewees expressed that the organization needed a more daring culture, where failures were embraced and viewed as excellent learning opportunities instead of something to penalize.

"We need to dare to try new things. We need to dare to fail, we need to dare to discard old ways of doing things since you typically do not do that in projects" (Interview 14)

Several interviewees also highlighted that they had started to make active decisions to alter processes to start this transition within their team, which often was done by taking actions in recruitment to find people that fit and could help to create this culture, as described below:

"So it is humans that dare to make mistakes, and on the selection, they should therefore score low on nervousness. It is all about fostering a culture where it is okay to make mistakes"
(Interview 15)

Another key attribute in the future culture that the Trained expressed was that it needed to be forward-looking and reinforcing behaviors that thought about not only what capabilities were needed today but also what capabilities were required tomorrow. They expressed that this was critical as they needed to get away from the current "here and now thinking" (Interview 2), to better prepare for future problems.

5 Analysis

This chapter analyzes the empirical findings by comparing similarities and differences between the groups through an IC lens using the determinants of an organization's IC. Firstly, the empirical findings associated with the determinant Resources (resources connected to the problem-solving process) are analyzed (5.1). Secondly, the empirical findings related to the determinant Processes (processes used for complex problem-solving) are analyzed (5.2). Thirdly, the empirical findings connected to the determinant Structures (the structures in which they organize their teams and organization to manage complex problem-solving tasks) are analyzed (5.3). Following this, the empirical findings associated with the determinant Values and Culture (associated with the teams and broader organization) are analyzed (5.4). Lastly, a synthesis of the analysis is presented (5.5).

5.1 Resources connected to the problem-solving process

From the findings, it emerged that the Trained and Explorers had an open and explorative mindset regarding the use of resources. Interviewees within these two groups repeatedly emphasized the need and value of using external resources as it was considered critical to utilize them, combined with internal resources, to manage complex problems. Consequently, these groups were found to use a broad range of resources due to their explorative resource mindset, with the Trained found to be the most comprehensive user of external resources. In contrast, it emerged that the interviewees among the Inexperienced tended to rely more on internal knowledge and information and favored collaborations with well-known partners. Thus, exhibiting a narrower mindset concerning resources, which resulted in a more narrow utilization of key resources compared to the groups exposed to DT, as they stressed the importance of utilizing internal over external resources more extensively.

An example of the abovementioned point, is how the different groups viewed and acted regarding human resource capital in their teams. In this area, the Trained and the Explorers were found to emphasize the need for a broad competence base in a team suited to handle complex problems. In contrast, it emerged that the Inexperienced instead emphasized the value of accumulated experience over different competencies and experiences. Consequently, showing the difference in viewpoints on what type of resources, internal or external, well- or unknown, traditional or untraditional, they valued most, with the Trained and the Explorers seeing the value and engaging

more with the latter types than the Inexperienced. Thus, the main difference between the groups was their mixture of resources when managing complex problems, whereas the Trained stressed using external resources most extensively. However, it should be noted that all groups recognized the need to have a mix of internal and external resources.

A connected finding to the final point made above was that the Trained also saw and acted on the need for change in the resources utilized by the organization when managing complex problems. The finding can be highlighted by the Trained´s expression of the changes they had made regarding whom they recruited, which was explained as moving towards looking for individuals with diverse backgrounds and expertise and a collaborative and change-prone mindset. Thus, it was evident that the Trained did not only have a thorough understanding of the value of having a diverse resource base and a mindset of exploring and embracing new resources but also that they felt empowered to act and, through this, actively make choices to change the resource base used by the organization.

5.2 Processes used for problem-solving

From the findings, it emerged that the process of managing complex problems had different starting points depending on whether the group had had exposure to DT or not. The Trained and the Explorers conveyed that the focal starting point was to acquire a profound understanding of the complex problem. The aim, shared by both groups, was to create an account of the type of problem it was to proceed effectively in the processes. Adding to this, the Trained was also found to have a secondary aim as they stressed the need to understand the real problems to be solved, which they viewed as critical to achieve effectiveness and efficiency. Consequently, based on the findings, the Trained group was found to have a more systematic and thorough approach to problem understanding than the Explorers by wanting to dive deeper into the problems underlying elements to better understand the problem at hand. Nonetheless, both groups were found to possess a problem-centered mindset, although this mindset's width and level of structure differed.

Compared to the Trained and the Explorers, the Inexperienced conveyed a different starting point for managing complex problems. In contrast to the other groups, it emerged from the findings that the Inexperienced starting point was more towards looking for solutions rather than creating a deep understanding of the problem. In this solution-finding process, the Inexperienced expressed favoritism for a linear and "traditional" process compared to the two other groups, who instead

conveyed a will to apply a more explorative and "nontraditional" approach to expand instead of narrow down their solution sphere. The difference in practice could be argued to be the enabler for the other identified difference in terms of solution space, which was found to be their view on solutions to complex problems. With their more linear approach, the Inexperienced communicated a desire to apply established solutions to complex problems, where using more resources was seen as the way to increase the efforts, as more arrests could be made. In contrast, with their more explorative solution process, the Trained and the Explorers highlighted the belief that complex problems required other solutions than the established ones favored by the Inexperienced. Thus, the Trained and the Explorers can be contemplated to have had a different mindset in terms of solutions compared to the Inexperienced, as they conveyed the need and thinking of finding, trying, and using new solutions to complex problems since they viewed the established methods as insufficient. Consequently, leading to those two groups using other approaches to manage complex problems compared to the Inexperienced.

Connected to the process of managing complex problems, the Trained and the Explorers were observed to express that they utilized several tools to facilitate their problem-understanding and solution-finding processes. In contrast, the Inexperienced were not observed to describe using tools to facilitate their processes. However, although the two groups exposed to DT expressed a wide usage of tools, some differences in their views were observed. The Trained were observed to use a broader range of tools which, moreover, was conveyed as more creative, iterative, and experimental than those used by the Explorers. Consequently, the Explorers were observed to have a more limited perspective on tools to facilitate the problem-solving process compared to the more nuanced understanding of problem-solving tools observed among the Trained.

As has been highlighted, the empirical findings showed significant discrepancies between the groups in how they managed complex problems, with the groups exposed to DT expressing that their approach was superior to the established status quo approach, encapsulated by the process described by the Inexperienced. Their rationale for this argument was based on them having tried both approaches and sticking with the prior. Consequently, it was not surprising that the Trained and the Explorers were observed to express critique towards the status quo ways of working. However, it is important to note that although the two groups exposed to DT expressed critique against the currently used processes, the findings showed that the level of critique and the level of detail in the critique varied between the groups, with the Trained being most critical and nuanced in their critique.

The exhaustive process understanding observed among the Trained was observed to not only led to their powerful critique of the currently used processes but also to their strongly expressed need for change within this area. The need for change in processes was observed to encapsulate the development of new methods and their continuous development, as process change needed to be viewed as a continuous activity to ensure their relevance to face current and future complex problems. Thus, the Trained were found to argue for the need to not only add new methods but also to embrace a mindset of continuous development in connection to *Processes*, which other groups did not share. Highlighting a key difference, as the training in DT did not only lead to a change in mindset and increased knowledge, resulting in critique towards the current approaches but also that these factors, taken as an aggregate, resulted in the group feeling empowered to engage in change within this area.

5.3 Structures in which they organize themselves in

As described in the Methodology, and in the Empirical Findings sections, all groups held a unanimous view of how the structures within the organization currently looked. However, this unanimous view did not extend to the observed critique against the current structures, as the groups were found to vary widely in the level and depth of their critique of the structures. Consequently, showing the differences in understanding of the current structure's implications. This point can be exemplified by thoroughly analyzing the critique of the downpipe structures. Because although all groups expressed critique against the downpipe structures and its ability to keep up with a rapidly changing external environment, only the groups exposed to DT conveyed what this implied for

their organization, with the Trained being the most precise in their analysis. Thus, calling attention to their more extensive understanding of the implications of the current structures possessed by the Trained and the Explorers compared to the Inexperienced.

Emerging from the above findings, it was unsurprising that the Trained and the Explorers also advocated for structural changes. Thus, compared to the Inexperienced, they did not limit themselves to only criticizing the structures as these two groups also emphasized the importance of moving towards a more decentralized structure with "gutters" over "downpipes, " implying a more distributed decision-making power and authority. Taken together with them both expressing their view of the sponsor and its role within the future organization, suggesting an understanding of stakeholder management, it was found that both the Trained and the Explorers had good knowledge concerning the need for structural changes and likely, based on this, felt empowered to ask for and engage in change within this area. However, it should be acknowledged that the Trained may be more future-oriented in their aspirations, as they also highlighted the importance of developing the role of the sponsor over time to facilitate the argued cultural change better.

5.4 Values and Culture in the teams and broader organization

Descriptions of their prevalent culture were, as described in the Methodology and Empirical Findings sections, was discussed in a similar way in all groups. However, it was found that only one group, the Trained, reflected on the prevailing culture and the values building it up, leading them to call for a need to change their culture as they envisioned a new future culture for the organization. This finding was not surprising given the differences observed between the Trained´s mindsets and the others throughout the analysis, as different mindsets require a different culture to support them. However, what is surprising is that the Explorers, who also were observed to possess different mindsets compared to the Inexperienced, did not share the same need for change related to culture. Consequently, highlighting an essential difference between the Trained and the Explorers, which shows that DT can be an enabler for cultural change, but only if sufficient knowledge has been given about the topic.

5.5 Synthesis of Analysis

The analysis of the findings showed that the Trained and the Explorers had another mindset concerning *Resources* and *Processes* compared to the Inexperienced. Consequently, leading these two groups to use a different mix of resources and work in differently-looking processes when managing complex problems compared to those who had not been exposed to DT. Thus, the findings showed that the DT-exposed groups not only thought differently concerning *Resources* and *Processes* but also acted differently, implying that change had occurred whereby they had moved away from the status quo ways of working, encapsulated by the Inexperienced. Connected to this point, the findings also showed that the Trained and Explorers expressed, although in varying degrees and depth, critique against the status quo ways of working employed by the broader organization, as they perceived their altered process to be superior. However, although both groups expressed critique, only the Trained took action on this critique and called for the need for change in the processes used in the wider organization. The same point was also observed concerning resources, as only the Trained called for the change in the organization's view and usage of resources. Consequently, highlighting one difference between the two DT-exposed groups by exposing the difference in the will and call for change within *Resources* and *Processes* whereby the added value of undergoing training in DT could be argued.

Regarding *Structures*, it emerged from the findings that although all groups, independent of the relationship with DT, criticized the current structures, they did this in varying degrees and depths, with the Inexperienced being the vaguest and shallowest in their critique. Consequently, this group did not call for a change within this area, which, in contrast, the Trained and the Explorers were observed to reach for. Thus, showing that they realized that the current structures were ill-fitted to support their new ways of working, which would limit them if not changed, and, hence, they were observed to see and call for the need to change *Structures*.

Concerning the final determinant, *Values and Culture*, it emerged from the findings that only the Trained reflected on it and, from this reflection, deduced that the organization needed a new culture. The conclusion was inferred based on the same logic, just explained in connection with structural changes, whereby this group concluded that a new culture was needed to fully support their usage of resources, processes, and the called for new overall structures. Consequently, showing the comprehensive understanding of the Trained.

6 Discussion and Conclusion

This chapter begins by relating this study's findings, as discussed in the analysis chapter, to previous research and discusses these (6.1). Following this, the study is concluded by circling back to its research question and answering it (6.2), presenting its theoretical contributions (6.3) as well as practical implications (6.4). Ultimately, the study's limitations are discussed (6.5), and future research avenues are presented (6.6).

6.1 Discussion

The findings of this study correspond to the earlier research by Carlgren (2013) and Carlgren et al. (2014), who described the value of applying DT through an IC lens within the business context. In their studies, they found that DT had several effects on the determinants of IC, thus arguing for the case of DT being able to affect the determinants of IC, although within a business context. The findings of this study correspond to some of their claims. Firstly, it corresponds to their claim that DT can alter the determinant *Resources*, as found by this study as well, independent of what type of exposure to DT. Secondly, it can be argued that this study's findings, independent of what type of exposure to DT, also partially correspond to the aforementioned scholars' claim that DT can alter their determinant named *Processes* if the determinant, that this study names *Structures*, is excluded, as this study treated it as an independent determinant, for which it did not find support for DT having an altering influence. The same point can be made concerning Carlgren (2013) and Carlgren et al. (2014) last determinant, called Mindset, equivalent to this study's determinant, *Values and Culture*, which additionally was not viewed to have been altered by the influence of DT, consequently highlighting differences in the different studies findings. However, it should be noted that this study found evidence of tendencies for changes in the two determinants just discussed, even though no fundamental changes were observed, which was primarily observed within the Trained group. One reason for this could be that DT, thus far, had only been used at the micro level and not at the meso- or macro level within the organization, consequently limiting DT´s ability to enact change in the more meso- and macro-connected determinants, *Structures* and *Values and Culture*. Another reason for the differences could be the factor of time, as Carlgren et al. (2014) argued that these determinants required time to change. Since the approach has only been in use since 2021 (Sjöberg, 2023), there is a risk that not enough time has passed for these determinants to change. Thus, corresponding to the findings of Carlgren (2013) who also argued

that it might take time for DT to realize its potential value. A final reason for the differences could be, as Carlgren (2013) argues, because of the inherent fact that DT is context-dependent and, thus, likewise, the impact of it. Consequently, arguing that the same effects seen within the business context might not be seen within the public sector context as the two contexts are not identical. Thus, neither is the value of DT.

As described in the Literature Review, DT has been argued by scholars to be a universal tool that can be adapted to multiple contexts (Brown, 2008; Hobday et al., 2012) and, in these contexts, facilitate innovation to increase the innovativeness of the organizations using it (Brown, 2008; Clark & Smith, 2008; Buchanan, 2011). As the findings of this study showed that DT influenced two out of the four identified determinants, it can be argued that DT, like within the business context, has the potential to alter specific determinants building up an organization's IC (Carlgren, 2013). However, the points made by Carlgren (2013) and Carlgren et al. (2014), that DT can build IC, cannot be supported, as it is argued to require changes to the whole system (O'Connor, 2008), which were not seen as no changes were observed for the determinants *Structures* and *Values and Culture*. Consequently, the prevailing structures, values and culture can be argued to, despite their best intentions, hinder the value realization of DT within the sample organization, which also corresponds with some of the findings from Carlgren's (2013) sample. In previous research, several innovation scholars have highlighted that values and culture can constitute significant barriers to innovation and, thus, to build IC (Christensen, 1997; Frances & Bessant, 2005), as also highlighted above. In connection with this notion, the aforementioned scholars have also underscored that these are among the most challenging aspects to change (ibid). It is, therefore, interesting to note that Carlgren (2013) found that the long-term use of DT within an organization could lead to changes in these aspects. In consequence, stressing that time is an important factor when building capabilities, as also highlighted by Shreyögg and Kliesch-Eberl (2007), and that if more time had elapsed between the introduction of DT within the organization and this study, changes might have been observed in these determinants leading to IC having been built.

Another value of DT, argued by Carlgren et al. (2014), was that it could facilitate the process whereby an organization becomes more open to alternative ways of working, which corresponds to the findings of this study, shown through the observed calls for change within the two groups exposed to DT, although primarily the Trained. Consequently, the study's findings correspond to

the findings of Carlgren et al. (2014), suggesting that DT potentially can act as an enabler for change through its ability to generate a sense of the need for change, thus facilitating and gathering support for the change effort. In summary, firstly, portaying that some findings related to the value of DT, as seen in the organizations applying it, can be transferable across domains, as was additionally shown in the earlier determinants discussion. Moreover, secondly, tying back to the earlier paragraph, over time, potentially enable change in the last two determinants and, through this, build IC, which consequently would increase the sample organization's ability to generate value via innovation in the long-term (Carlgren, 2013).

As discussed in the Literature Review, DT has been questioned concerning its effectiveness, longevity, and suitability in various contexts, including the public sector (Liedtka et al., 2020; Johansson-Sköldberg et al., 2013; Nussbaum, 2011). The findings of this study partially supports some of the criticisms as they do not portray a change in the organization's IC, and consequently, the argued value of DT cannot be ascertained. Thus, the findings of this study align with the concerns acknowledged in the Literature Review concerning the notion of DT potentially being a management fad. As the study also observed differences in the impact of DT between the Trained and Explorers, where the Explorers, which had been self-exposed to DT, showed fewer substantial alternations, implying that the application of DT might not be universally effective in all public sector setting, which is a notion that is in line with the critiques' concerns about its generic applicability (Liedtka et al.,2020).

6.2 Answering the Research Question

This study was initiated in response to the growing demand for public organizations to discover innovative solutions to manage societal issues amidst increasing pressure from the public, lawmakers, and the internal pressure derived from resource scarcity put on organizations within this context (Jaskyte & Liedtka, 2022). As both practitioners and researchers have pointed out, DT is a potential method that can address this challenge due to its proven success in the business context and argued application in the public sector (Brown, 2008; Brown & Katz, 2011; Carlgren, 2013; Liedtka et al., 2020). However, the lack of empirical research on its performance and effectiveness in promoting innovation within the public sector has raised concerns among scholars and practitioners, leading them to call for further investigation (Carlgren, 2013; Liedtka et al., 2020). This study responded to this call, aiming to fill this and other research gaps by providing

insights into the use of DT and its influence on innovation, within public sector organizations, by taking a performative perspective utilizing an IC lens and through this answer, the study's research question:

How does Design Thinking influence the Innovative Capability of a public sector organization in its work against complex societal problems?

The findings portrayed that DT, within the sample organization, changed some of the determinants related to IC, although influencing all identified ones. The study found that DT altered the determinants *Resources* and *Processes* while only having the ability to influence the determinants *Structures*, and *Values and Culture*, as only opinions connected to the last two determinants were observed to have changed and not the actual determinants. As a result of the determinants building up an organization's IC being system dependent and given that not all of the determinants were observed to have changed in the sample organization, as a consequence of being exposed to DT, the findings of this study consequently does not support DT having an aggregated effect on the sample organization's IC in connection to their work against complex societal problems, even though alterations in individual determinants were observed.

6.3 Theoretical contributions

The theoretical understanding of DT, IC, their connection, and the usage of them within the public sector has all been strengthened by this study, in line with the identified research gaps. Firstly, this study has responded to the call by Johansson-Sköldberg et al. (2013) and other scholars' requests for additional research on the performative value of DT within contexts other than the business context. In this effort, the study has shown that DT has the ability to alter specific determinants (*Resources* and *Processes*) of IC within a public organization. However, questions concerning its aggregated effect on the innovation of a public sector organization still exist since DT was not found to alter the IC of the sample organization, and thus neither its muscle for innovation (Carlgren, 2013). This result contradicts what scholars have argued in earlier literature (Arundel et al., 2019; Lewis et al., 2019), posing interesting questions for future research.

Secondly, this study has responded to the calls by Carlgren et al. (2014) and Hobday et al. (2012) to investigate the applicability of using IC to evaluate the performative value of DT, whereby this study has helped to build theory and expand the understanding of the connection between DT and

IC, and thus, shed light on how IC can be used to evaluate DT. Consequently, strengthening it as a suitable approach to evaluate the performative value of DT within a public sector organization.

Lastly, this study has answered Gullmark's (2021) call to enhance further scholars' understanding of IC within the public sector. It has contributed by enhancing scholars' understanding by suggesting that the IC determinant *Strategic intent*, applied and strongly argued for within the business context (Carlgren et al., 2014), might not be applicable within the public context since this study found no connection to the aforementioned determinant. The study has also shown that DT can be used to build certain parts of an organization's IC through its effect on the two IC determinants, *Resources*, and *Processes*. Consequently, contributed to scholars' understanding of how certain areas of an organization's IC can be built within a public sector organization.

6.4 Practical implications

The findings of this study suggest that DT has several practical implications for public sector organizations. Starting off, this study suggests that it is a method that can be used within a public sector organization and that can provide value in certain areas which are important to the organization in its effort to manage complex societal problems. Thus, DT is not only applicable within the business context.

Secondly, the findings of this study suggest that DT has the potential to result in a broader resource mindset which can result in a broader utilization and exploration of resources to gain information and help from. This can be useful to facilitate the organization's efforts of managing complex problems as it has the potential to provide them with inspiration and knowledge to pursue new potential avenues to managing complex problems. In this study, this mindset, enabled by DT, manifested itself through new and more collaborations, increased openness to external perspectives, and a move from looking for experience to looking at competencies in recruiting new team members. All of which can be beneficial for practitioners within the public sector to consider due to their often high inertia in terms of ways of working and prevailing status quo culture.

Lastly, the findings of this study also showed that DT enabled significant changes in the approaches that employees and teams took in their overall problem-solving processes within a public sector organization. This study revealed that DT could change process focus, going from a solution mindset to a problem mindset; increase the divergent thinking and, consequently, the

solution space; and the number of tools used to support the overall process. All of these, in totality, can lead to a more problem-focused process centered around creating a deep problem understanding, argued to be essential for problem-solving in the innovation literature (Kelley & Littman, 2001), and which through the use of a wide variety of tools can result in new types of proposed solutions, through this overall more explorative process. For practitioners, this insight can be valuable since DT, thus, can be argued to be a way to alter the overall problem-solving process, which potentially could spur new solutions and be beneficial for practitioners looking to change internal processes.

6.5 Limitations of the study

The study's findings are subject to certain limitations that must be acknowledged. Firstly, it should be noted that the study only provides a snapshot of the organization's current status. As such, the opinions and views of the interviewees may not necessarily reflect a status quo setting. The current status of the organization is influenced by various external factors, such as the increased levels of deadly violence in organized crime in Sweden during recent years (TT, 2022; Underrättelseenheten, 2019) and shifting government directions (Liedtka et al., 2020), and due to the limited time-frame of the study, a longitudinal study could not be conducted, meaning the study was not able to examine how these external factors impact the organization's IC and how DT influences the determinants over time. Instead, triangulation was used to verify the findings through additional data sources.

A second limitation is the risk of biased responses from interviewees that had undergone DT training, as they may have responded positively towards the method as a way to please the sponsoring manager, also referred to as social desirability bias (Arnold & Feldman, 1981). The risk of this limitation was apparent due to the hierarchical structure within the organization in combination with the initial DT project's sponsor being the author's primary contact, which in totality may have pressured lower-level employees to provide positive feedback on the method to satisfy the sponsor. To mitigate this, the interview guide was designed to be open-ended and exploratory to encourage interviewees to provide their perspectives and experiences related to innovation. The interview list was also anonymized to secure candid answers and to minimize the potential risk of biased responses.

Lastly, while the study focused on the application of IC, it is important to note that the approach was primarily based on a business context perspective due to the lack of prior research within the public context. This meant that the interview guide may have missed important areas unique to the public sector. Consequently, this can limit the generalizability of this study's findings as there can be factors specific to the public sector context that was not fully captured by this study. However, as the subject is limited within this specific field (Gullmark, 2021), it was also one of the main reasons that prompted the need for this study.

6.6 Future research

The authors hope this study will facilitate future research within the field of DT and IC within the public sector context. Starting off, to strengthen the findings of this study and investigate the arguably more time-sensitive determinants *Structures and Values and Culture* (Carlgren, 2014), it would be relevant for future researchers to take a longitudinal approach to investigate if the findings presented in this thesis, hold over time within the public sector, and what effect time has on the determinants *Structures* and *Values and Culture*. Secondly, it would also be interesting to take a longitudinal performative perspective on DT through the lens of innovative outputs to ascertain whether the hypothesized innovative gains, described as muscle for innovation (Carlgren, 2013), are reflected as output in society. As the tacit knowledge embedded in the design principles, on which DT is based, can take years to develop (Johansson-Sköldberg et al., 2013), both of the two presented longitudinal research approaches are deemed valuable in enhancing the understanding of the long-term impact of using DT, which additionally will, moreover, also provide value to the debate concerning DT being a potential management fad.

Thirdly, earlier research on IC within the business context has highlighted *Strategic intent* as an important determinant of an organization's IC (Carlgren, 2013; Carlgren et al., 2014; Björkdahl & Börjesson, 2012). However, the findings suggest that not be the case for organizations in the public sector. Thus, it is suggested that future research seeks to validate this finding and investigate the potential reasons for this dissonance with the business based IC literature.

Lastly, the observed differences between the Trained and the Explorers in all identified determinants pose interesting questions concerning how the organizational members' introduction to the approach influences the value it provides to the organization. To the best of this study's knowledge, this research avenue has previously not been explored within the current DT literature,

even though it may provide significant value by enhancing the understanding of how organizations can extract the maximum potential value from the approach. It is, therefore, suggested to be an interesting area needing additional research.

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8 Appendices

8.1 Appendix A. Introduction to Security Design and Innovation

Introduction to Security Design and Innovation is a design course that is specifically created for the context of security and law enforcement. The course is created and taught by Cordillera Applications Group, Inc, which describes the course as follows:

Security Design & Innovation (SDI) is a unique multi-disciplinary application of 'design methodologies' in security contexts that relates specifically to governmental, military, as well as commercial enterprises generating novel and innovative tactical, operational, and strategic concepts in order to gain a competitive control or security advantage in complex and emergent security environments. (Cordillera Applications Group Inc, 2023)

The methodology taught by Cordillera Applications Group, Inc includes five steps:

Step 1.

The first step concerns reflecting and challenging one's cognitive and social frames to reexamine and discover one's social beliefs. The goal is to frame the boundaries of one's paradigm and open up to see others' respective paradigms, thus expanding one's understanding of the world.

Step 2.

The second step concerns exploring alternative frames from multiple stakeholders' perspectives. Through divergent thinking, the aim is to widen one's understanding of the world and explore the problem(s) from multiple perspectives and in social frames.

Step 3.

The third step is about envisioning several different possible futures (solutions). It is, at this stage, recommended to explore unorthodox and creative ideas in a thoughtful way that critically reflects on both the proposed ideas and current already-in-use solutions and also to investigate what one should let go off. This stage emphasized that the process should center around unconventional and divergent thinking to enable an expansive environment of possible futures.

Step 4.

The fourth step concerns converging the thinking from the third step and creating prototypes to test the viability of the ideas. Using narratives to explore the validity of the intended ideas and better convey them to internal stakeholders is recommended. Through the convergent process, the aim is to create narrow suggestions that are more likely to achieve the envisioned future.

Step 5.

The final step, which is an overarching philosophy of steps two to four, is to apply an iterative process throughout the process. Early experimentation through prototyping is encouraged to early on gain essential knowledge from which crucial learnings can be drawn through critically reflecting on the information at hand and one's beliefs. The group should, at this stage, focus on critically reflecting and reframing the problem at hand and the intended future state by jumping back and forward between steps two to four as more knowledge is internalized (Cordillera Applications Group, 2021).

8.2 Appendix B. Interview Guide

Preparatory information to participants

Hi Name,

We hope everything is well with you.

We are contacting you because of your interest in participating in the study we from the Stockholm School of Economics are conducting with the Swedish Police Force. The investigation concerns innovation and, in particular, Design Thinking within the context of Law Enforcement, and representing the Swedish Police force is Magnus Sjöberg, the project leader for this collaboration. We highly appreciate your interest and willingness to help us increase your understanding of how Design Thinking, as a tool, should be used within the Police force.

We do not know how much information Magnus has shared regarding the study, our approach, or the interview, so we have summarized the most important information below for your convenience.

We are conducting a study in collaboration with the Swedish Police Force to investigate how an education within Design Thinking that some of you have undergone in partnership with the Swedish Armed Forces affects your innovative capability in your work against organized crime. The study will be qualitative, meaning we will conduct deep-dive interviews with persons who have completed and not completed the training. Through the interviews, we aim to understand how the training affects the innovative capability of the Swedish Police Force.

The interview will last approximately 45 to 60 minutes and be conducted through Microsoft Teams to maximize your convenience. The discussion will be semi-structured, meaning the questions will be standardized but very open to allowing you to share your thoughts about the topic thoroughly. If necessary, follow-up questions will be asked to further enrich our understanding of the topic. You will be given access to the collected material after the interview to ensure we understand your answer correctly.

Once again, thank you for wanting to participate in this study. We look forward to working with you and wish you a pleasant day.

Kind regards,

Erik Karnehed and Rasmus Eriksson

MSc in Business & Management at Stockholm School of Economics

Interview guide

When the interviewee presents an interesting answer, we will center our attention on getting to the root cause of that answer by asking many "why", "how" and "when" questions and, through this, enrich our and the study's understanding of the phenomenon.

Introduction

1. **Introduction**: Introducing ourselves and who we are, while also thanking the participant for participating in the interview.

2. **Purpose**: Explain what the project is about, and how the information from the interview will contribute to the study, while also describing what types of questions will be asked, and the question's relevance to this study (What, how and why questions).

3. **Timeframe**: Clarify the expected length of the interview and ask if there are any time constraints that need to be considered.

4. **Confidentiality and anonymity of data**: Ensure the interviewee that the information they disclose, during the session, will remain confidential, and that their anonymity will be safeguarded.

5. **Use of data:** Explain how the data from the interview will be utilized and its contribution to the study´s general conclusions. Provide details regarding who will have access to the data and the approach for its analysis.

6. **Give interviewee option to stop if necessary**: Highlight that the interviewee´s involvement is entirely optional and that they may opt-out at any time.

7. **Review of the results:** Provide details on the publication, method for the study´s analysis and where to access and review the content before publication. Offer the participant the chance to give their feedback or comments on the material.

8. **Request permission to record the interview:** Clarify that the interview will be recorded and elaborate on the steps that will be taken to safeguard the confidentiality and privacy of the interviewee.

Questions

Topic 1. Demographics – Warm up and background information

1. Tell us a bit about yourself, for instance how long have you been working in the Swedish Police force?

2. What department are you working for, what are your main responsibilities and what is your area of expertise?

3. How many years have you been in your current role?

4. Have you conducted training in Design thinking?
   a. If yes:
      i. How long ago?
      iii. What was your general impression of the training?
   b. If no:
      i. Is there a reason to why you have not undergone the training?
      ii. Has anyone else that you are working with undergone the training?

Topic 2. Innovative capabilities on an overarching level

5. How would you define innovation, within the context of Law enforcement?
   a. Do you have any examples?

6. Can you describe a time when you or your team did something that you thought was innovative?
   a. How did you do it?
   b. How did your process look?
   c. What made it, in your opinion, innovative?
   d. Was it anything that you believe was extra important in achieving the result?

7. Can you describe how you and your team, work with complex and challenging problems?
   a. How does your process look like?
   b. What resources do you utilize to help you solve the problem?
   c. What kind of support do you get in solving the problem?
   d. How do you and your team structure yourself to solve the problem?
   e. What do you believe is crucial to your problem-solving approach?

Topic 3. Resources

8. Can you describe which resources you have available to you to facilitate your innovative work?

    a. Which resources do you mostly use?

    b. Which resources do you seldomly use?

    c. Which resources do you believe are most important?

        i. Why?

    d. Which resources do you believe are least important?

        i. Why?

Topic 4: Processes

9. Can you describe the processes you utilize when working with complex problems?

    a. Which sub processes do you believe provides the most value?

        i. Why?

    b. Do you feel that there are any sub processes, currently in place, that do not provide much value?

        i. Which?

        ii. Why?

Topic 5: Values and Cultures

10. How would you describe the culture within your team?

    a. What values, in your opinion, is it built upon?

    b. Where do you think these values originates from?

    c. Do you believe that these values are shared by everyone in the organization or are they specific to your team?

        i. Why?

        ii. Why not?

Topic 6: Structures

11. Can you describe how you are organized within your team and where you fit in within the broader organization?

12. Can you describe how decisions are made within your team?

    a. Why is it the way it is?

Topic 7: Strategic intent

13. How would you describe the overall strategy of the Swedish Police force?

    a. Does your department's strategy differ in any sense and if so, how?

       i. If yes

          1. Why?

14. How would you describe the vision of the Swedish Police force?

    a. How does it manifest itself within your everyday work?

Wrap-up

15. Is there anything else you would like to add concerning how you work with solving problems and innovations or anything else that we have discussed?

Finishing notes

Thank the interviewee for his/her participation and ask how they would like to gain access to the material to verify our understanding of what has been said during the interview, encapsulated by our transcript. Inform them of how they will be able to access the results of the study once it is finished.

Operationalization of the Innovative Capability theory

Explanation of how the different questions, listed in the interview guide, are connected to the IC theory and the different determinants building up an organization's IC.

Area of interest	Argument for relevance theme	Question example
Background	General questions about the interviewee and about his or her role and experience within the Swedish Police force	• Tell us a bit about yourself, for instance how long have you been working in the Swedish Police force? • What department are you working for, what are your main responsibilities and what is your area of expertise? • How many years have you been in your current role? • Have you conducted training in Design thinking?
Innovative capabilities on an overarching level	Identify how they are currently working with problems in the entire problem-solving chain and what they see as an innovative solution to a problem	• How would you define innovation, within the context of Law enforcement? • Can you describe a time when you or your team did something that you thought was innovative? • Can you describe how you and your team, work with complex and challenging problems?
Resources	Identify what resources they possess, utilize and value in their current problem-solving process	• Can you describe which resources you have available to you to facilitate your innovative work? • Which resources do you mostly use? • Which resources do you seldomly use? • Which resources do you believe are most important? • Which resources do you believe are least important?
Processes	Identify the different existing subprocesses which support their current problem-solving approach and how they are valued	• Can you describe the processes you utilize when working with complex problems? • Which sub processes do you believe provides the most value? • Do you feel that there are any sub processes, currently in place, that do not provide much value?
Values and Culture	Identify the underlying values and culture that governs and influences their current problem-solving approach	• How would you describe the culture within your team? • What values, in your opinion, is it built upon? • Where do you think these values originates from? • Do you believe that these values are shared by everyone in the organization or are they specific to your team?
Structures	Identify the existing structures in place to support their current problem-solving approach to investigate how they are structured	• Can you describe how you are organized within your team and where you fit in within the broader organization? • Can you describe how decisions are made within your team?
Strategic intent	Identify the organizations strategic intent and how that is influenced and influences their current problem-solving approach	• How would you describe the overall strategy of the Swedish Police force? • Does your department's strategy differ in any sense and if so, how? • How would you describe the vision of the Swedish Police force? • How does it manifest itself within your everyday work?

8.3 Appendix C. Interview Subjects

#	Group belonging	Part of the organization	Role	Duration	Date
1	Trained	Nationella Operativa Avdelningen	Manager	60 min	2023-01-27
2	Trained	Nationella Operativa Avdelningen	Middle Manager	60 min	2023-03-03
3	Trained	Nationella Operativa Avdelningen	Analyst	60 min	2023-03-03
4	Trained	Nationella Operativa Avdelningen	Middle Manager	60 min	2023-03-08
5	Trained	Nationella Operativa Avdelningen	Middle manager	55 min	2023-03-08
6	Explorers	Regional Division	Analyst	60 min	2023-03-08
7	Explorers	Regional Division	Manager	55 min	2023-03-10
8	Explorers	Regional Division	Middle Manager	60 min	2023-03-13
9	Explorers	Nationella Operativa Avdelningen	Manager	45 min	2023-03-13
10	Inexperienced	Regional Division	Manager	50 min	2023-03-15
11	Inexperienced	Regional Division	Manager	55 min	2023-03-15
12	Explorers	Nationella Operativa Avdelningen	Manager	50 min	2023-03-16
13	Trained	Nationella Operativa Avdelningen	Analyst	40 min	2023-03-20
14	Trained	Nationella Operativa Avdelningen	Manager	50 min	2023-03-21
15	Trained	Nationella Operativa Avdelningen	Manager	45 min	2023-03-21
16	Inexperienced	Nationella Operativa Avdelningen	Analyst	60 min	2023-03-22
17	Inexperienced	Nationella Operativa Avdelningen	Analyst	60 min	2023-03-22
18	Inexperienced	Regional Division	Manager	45 min	2023-03-23
19*	Trained	Nationella Operativa Avdelningen	Manager	60 min	2023-03-27
20*	Inexperienced	Nationella Operativa Avdelningen	Analyst	35 min	2023-03-28
21*	Trained	Regional Division	Analyst	60 min	2023-04-03