Key Factors in Systems Thinking Reforms
- A Study of employees’ perception of the reform

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Abstract

Systems Thinking, (ST), has lately received increased attention, once again, as a result of accelerate change conditions and as organisations seem to operate in a more complex and uncertain context, which demands a new way of thinking. ST is an answer to these challenges as it is a way of thinking and acting that adopt a broader perspective. However, the perspective is not new itself and despite its positive aspects, it is still received inferior attention in the academia as well as practice. The purpose of this research was to contribute to an understanding of the employees perception of the change process towards this perspective, in order to gain an understanding of what is difficult and what factors that have helped these individuals to gain the perspective. A theoretical framework was developed and by conducting an exploratory study of the individual change, data were collected from in-depth interviews. The research findings come up with a model of nine key factors that are considered helpful to the employees in the change process, and three of those especially useful when implementing the ST perspective. The model can be seen as practical guidelines for implementation of ST reforms.

Keywords: Systems thinking, Change processes, Individual Change, Feedback, Complexity, Individual perception, Holistic view.
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Appendix.
Appendix A. Interview guide
1. Introduction

1.1 Another Way of Thinking

Organisations operate in more complex and uncertain contexts, a result of changed conditions in for example technological development, globalisation, and information overload (Stacey, 1993). The changed social conditions leads to a faster changing pace, greater dependency on our surroundings as well as an increased complexity (Senge, 2006:69). This, among other things such as that the traditional hierarchical structure that for long has been the norm in organisations has been questioned, has generally increased the interest for finding new ways of handling these problems (Seddon, 2005). Traditionally an approach of breaking everything down into parts to understand them, i.e. reductionism, has been generally applied (Flood, 2010; Jackson, 2006). However, in recent years Systems Thinking (ST), a more holistic approach, has once more gained attention as a way to increase efficiency and as a tool to understand the structures and dynamics of complexity (Senge, 2006). The literature of the subject argues for the linkage between ST with organisation performance and profits, including motivational reasons when for instance understanding the effect of your acts (Lukka & Pitkänen, 2011; Senge, 2006). Further, research has already proven both the general potential of ST and applications in specific areas to ease the challenges, of which one example is the public health care (Trochim et al., 2006).

ST is a perspective that encourage the individuals to see from a broader perspective, i.e. a holistic view, where the parts are seen together as a “whole” instead of a focus on parts separately. It is a way of thinking on your environment where you see the surrounding as a part of an interconnected system (Dekker et al., 2011). For instance an organisation can be seen as a system, where all employees need to understand that their functions and tasks are connected and influence each other. As well as understand everyone’s aim for an organisational overall purpose instead of a e.g. functional target or budget that is common in organisations. ST reforms differ from implementing a new structure or a strategy into an organisation in that sense that it is regarded to be a way of how individuals, i.e. the employees in the organisations, are thinking about their surroundings, both in professional and personal life. It could encourage a shift in mind (Senge et al., 1999).

As it is a way of thinking, it is the individuals that need to respond to the change (Seddon, 2005). For some employees this perspective is obvious, while for others it can be more
difficult. Difficulties could, according to Senge (2006) lie in structural barriers or as Bazerman & Moore (2009:46) describes it, restrictions in the way individuals think and of the assumptions they make. There are, as mentioned, many benefits with the perspective, however it has also received some criticism. The criticism especially includes the difficulty for a leader to be able impact a large and fast growing organisation and having all managers live this philosophy (Senge et al., 1999:161). Also Ackoff (2006) arguing that one of the reasons for not adopting ST and failure to achieve individual learning, is due to leaders that lack proper knowledge, and understandings of ST, partly due to the fact that very little of our literature, and lectures are aimed at potential users. Varity in the difficulty of adopting ST is argued to be a cause of personal abilities such as having the willingness to change and being curious (Senge et al., 1999:13), which can play an important role in every change initiative, including ST reforms that for some people requires a new way of thinking. With that said, some individuals might have gained the broader perspective earlier in life, whereby a change is not necessary. However, despite abilities, there are other factors that are regarded to affect and be helpful for the individual in gaining a broader perspective, which are believed to be important. Additionally, the adoption of ST reforms are reasonably empirically unexplored in the Swedish public sector, making it an interesting area to study. What’s lacking are practical guidelines in how such change can appear and progress, out of an employee perspective.

1.2 Purpose and Research Question

The purpose of this study is to gain a better understanding of how employees participating in pilot projects of organisational change towards ST, perceive the change. The goal is to provide practical guidelines in order to better be able to implement ST in organisations, by develop a model for implementation of ST reforms. The paper is addressed to organisational practitioners and academics who are looking for a different way of making sense of their own experience and rapidly changing world. This results in the following research question:

*What factors are important when implementing Systems Thinking in an organisation in order to get employees commit to individual change and to adopt a Systems Thinking perspective?*

The study will be conducted by performing in-depth interview with employees from four Swedish public authorities participating in a project initiated in 2012 by The Council of
Innovation, and now led by The Swedish National Financial Management Authority (ESV), that recently have gone through an implementation of ST in their respectively organisation.

1.3 Logic of disposition
There are various application and definitions of the concept ST. The vastness of the literature alone can be overwhelming, and it is not easily summarized. Therefore a simplification is used in this study, focusing on three important parts of ST in order to make the study more comprehensive, and the following findings applicable. Henceforth, ST will thus be defined as being constituted of three fundamental parts, which are; 1. To see from a holistic perspective, 2. Have the ability to adapt regularly feedback and 3. Have the ability to understand interrelations in complexity. These three parts will be further presented in the next chapter, but first an introduction part will follow in order to introduce the perspective and its origin. Finally a brief description of difficulties with change in general as well as difficulties with particularly the ST perspective will follow.
2. Literature Review

2.1 What is Systems Thinking?

ST is a general conceptual orientation dealing with the interrelationships between parts and how they together create a functioning whole, often understood within the context of an even greater whole (Fuenmayor, 1991; Trochim et al., 2006). It can be described as an overall perspective and a way of understanding the complex world we live in (Checkland, 2012). Complexity can here be described as the core problem of the technical science, including theory of decision making and planning (Luhmann, 1983). ST basically means having a holistic perspective on your surroundings (Sterman, 2000) and see the surroundings as a system where everything affects everything. We engage in a type of ST in our everyday lives when we for example study the complex interactions of our relationships with families and friends, or when we organize in our communities or workplaces (Trochim et al., 2006). For instance, social systems arise if actions of different persons relates to themselves through others (Luhmann, 1983). Theoretically, ST is a discipline of its own with knowledge drawn from a number of areas including for example cybernetics and theory of complexity (Luckett & Eggleton, 1991; Mingers, 2007). Today this way of thinking systematically are applied in a great amount of scientific fields like evaluation, education, business & management, health, sociology & psychology, sustainability and environmental sciences (Cabrera et al, 2008; Checkland 2012).

Moreover, a system can be defined as an arrangement of parts that interact and are dependent on each other within the system, to function as a whole, whereby the form of a system vary and for example a whole organisation can be the system for an employee (Fuenmayor, 1991). Systems can be both mechanical and biological. In the mechanical metaphor, systems are construed as machines made up of parts or subsystems that interact in complex ways to produce certain characteristic behaviours. In the biological metaphor, systems are living and evolving entities, often composed of subsystems that are themselves evolving and adapting to the environment (Trochim et al., 2006). Although ST originally is not either mechanistic or biological, particular phenomena may be partly characterized by one or the other metaphor or by some combination of the both metaphors (Trochim et al., 2006). The word thinking refers to the fact that ST is not just a structure or strategy, but a different way of thinking that could be argued to require a shift in the mind of the individual (Argyris, 1993; Senge, 2006:69). In other words, ST can be described as a way of thinking of the surroundings. For instance to
think of your organisation in a broader perspective, with the whole as a fundamental point of reference (Sterman, 2000), the perspective can gain an understanding by the individual to be a part of a larger system in where everything is connected and all parts influence each other (Dekker et al., 2011).

2.1.1 Systems Thinking was Brought Back in the Nineties

The concept of ST is ancient in origin but can also be seen as something very modern, according to Trochim et al. (2006). Three major phases of ST can be distinguished since its origin; firstly, the early years between the 1920s to 1960s when the fundamental concepts were developed. Flood (2010) and Jackson (2006) argue that ST has emerged through a critique of reductionism, a philosophy where understanding and the knowledge of a phenomena is derived from breaking it down into smaller parts and study single components separately. Then, in the years between 1970 and 1990 the specific methodologies where applied and several scientists began to think in a new way and cybernetic theory and Bertalanffy’s (1950) path-breaking research of open systems theory came around that time, and shares an interest in many of the concepts of ST. Arguing from the perspective of Bertalanffy, there is no distinction between social, biological and technological systems. He sees every system as a whole made up of interconnected and interacting components. On the other hand, both Luhmann (1995) and Weick (1995) argue their respective theories from the interlinked and interacting components in the system. Luhmann (1995) does so more from a sociological/administration sciences perspective, so called “social systems theory” while Weick (1995) approaches systems from a social psychological/organizational sciences perspective (Valentinov, 2013). With this said, Luhmann focuses on the process of communication between systems, while Weick’s focus is on the process of how a receiving system makes sense of the information interpenetrating into the system (Van Lier, 2013).

The field of ST really took shape after the Second World War when open systems theory and cybernetics began to influence practice and became generally known as “applied systems thinking” (Flood, 2010). Later, in the 1980’s, system dynamics theory was introduced by Forrester (1986) creating models of real world systems and studying their dynamics. In recent years ST has come to the fore again, and has emerged from complexity theories and the growth theory, suggests that we can see performance as result of complex interactions and relationships (Dekker et al, 2011), partly through the popularity of Senge’s The Fifth
Discipline published in 1990, which recommended ST and the basic ideas of systems dynamics as part of the “learning organisation” approach (Mingers & White, 2010).

One reason for this re-emergence of ST theories lies in the fact that the traditional structure of command and control recently has been questioned and argued to be out-dated (Kayes et al., 2013; Seddon, 2005). This traditional structure and way of controlling is said to emerged from mass production systems (Womack & Jones, 1991), and it is a top-down structure of divided functional departments, where decisions are taken based on measures derived from budget, standards and targets etc. (Seddon, 2005). This has been argued to create focus on the functions to only achieve their own functional goals, in disfavour of the overall organisational purpose. It can improve some functions, but it often leads to sub-optimization of the whole. Moreover, the clear division of functions results in employees getting tightly coupled to their specific task, which delaminate change processes in general, as well as it makes them respond to management requirements rather than customer needs (Radnor, 2010). Within the field of business, some mean that ST has connection to the philosophy of “lean”, a strategy to realize a stream efficiency in organisations without affecting the efficiency of resource utilization, something first applied in the manufacturing industry (Womack & Jones, 1991). However, when the philosophy was applied in the service sector, focusing on customer demands rather than production efficiency, it became “systems thinking” (Deming, 1986). The possible connection here lies in the importance of identifying the system of the organisation or production, in order to see the whole chain of activities. For ST, this mean seeing the organisation as a specific type of social system (Martens, 2006). To conclude, ST has an ambitious origin and are close connected to other theories, some of them highlighted above. Henceforth, the three fundamental parts of ST, as it is defined and interpreted in this paper, will be deeper discussed.

2.2 Holistic View is Fundamental

Obtaining a holistic view is possibly the most crucial part in ST (Ackoff, 1999; Checkland, 2012; Senge, 2006:68), mostly since ST is based on the principle for holism that suggest the perception of the world as a whole (Ackoff, 1999; Checkland, 2012). Holistic view is to see the “whole” that emerges from the interactions and relationships between the parts, where focus is not on the parts but on the relationships, and communication between these (Jackson, 2006; Ackoff, 1999; Gharajedaghi, 1984). The holistic view can also be described as an outside-in perspective with a focus on understanding customer demand, which per se will
contribute to a broader picture of the system. To get this broader perspective, employees need to get different perspectives and to work together in order to pursue towards the same goal (Chapman, 2002). One way to do this is to go out from our own person and look broader around us, expand the personal boundaries of awareness, which means to not only manage the own position (Senge, 2006:344). Further, Seddon (2005) argues that a good way of handling the great variety of customer demands in service organisations is to give more responsibility for the employees to perform their tasks. Another way to get this broader perspective is to create a collective sense of responsibility among workers. According to a study by Majchrzak & Wang (1996), individuals who feel collectively responsible are willing to work harder not to let the group down, and are more willing to help others even though they are on tight deadlines, which increases the efficiency of the businesses. This feeling of collective responsibility could be created with rewards based on group performance, having overlapping responsibilities, structure the work so the employees could see each other’s work, and make sure that individuals in different position can easily collaborate. Holism is also regarded to have advantages over traditional, reductionist approaches (See 2.1.1), in for example handling complexity, diversity and change (Jackson, 2006). However, reductionism is commonly deeply embedded in our culture (Chapman, 2002), why it is common that problems and parts thereof are treated in isolation, ignoring the systems around it and the dependency between of the parts (Sterman 2002).

### 2.2.1 Barriers to Grasp a Bigger Picture

Obtaining a holistic view could be difficult for individuals and according to Senge (2006), this is especially due to the structural barriers for individuals to acquire a holistic view on their work and life. Individual’s ability to grasp a bigger picture or a different perspective, are usually restricted in the way they think and of the assumptions they make (Bazerman & Moore, 2009:46), and not by lack of information. For instance a presumption of “knowing best” restricts any learning experience, as well as understanding of other perspectives (Chapman, 2002). This is also called overconfidence and is a bias derived from the confirmation heuristic, usually something we are unaware of (Bazerman & Moore, 2009:41). Hence, ST requires people to reflect on their way of thinking, assumptions and goals. (Chapman, 2002)

Another factor that can hinder the possibilities to think holistically is the traditional command and control structure (See 2.1.2), as it prevents everyone from collectively working towards
the overall, holistic, purpose (Seddon, 2005). This also creates a culture and unfavourable functional mindset in the organisation, which could be difficult to change according to Majchrzak & Wang (1996), which further argues that even for manager, the narrow mindset could imply missing out possibilities of overall improvements for the organisation. Therefore, it is not only about changing the functional structure, but also about changing the culture from thinking functionally to get people to adopt broader perspective (Majchrzak & Wang, 1996). Furthermore, for individuals, it is usually easier to recognize the parts in a system rather than the relationships between them, which is usually due to that organisations generally don't emphasize the relationships as important, but also due to the common nature of relations that tend to be informal and somewhat tangible (Dawidowicz, 2012). Hence, holistic view requires understanding of the process, structure, function and context at the same time (Ackoff, 1999; Gharajedaghi, 1984). Obtaining the whole picture of a system can seem to be an overwhelming task, which is also a valuable insight to possess, and that ought to be continually reflected upon. One way of dealing with this is said to drawing your own boundaries of the system, and deciding your whole where you include some things and disregard others depending on the context, according to Churchman (1979, cited in Jackson, 2006:650-651; Mella, 2012:7).

2.3 Feedback Help us to Understand Systems

The concept feedback can be widely understood, and a common description is that it means to gather opinion about an act we have undertaken, either positive or negative. A further, narrower definition, is that it can be seen as a retrospective information about something, of where actual performance and pre-set goals are compared and further the differences are pointed out (Senge, 2006:74). From a broader viewpoint, feedback is information which can be used to forecast the need for actions in the future (Lukka & Pitkänen, 2011). In ST however it can mean more than that. In ST feedback and guidance is regarded to be important as it helps individuals understand what they need to focus on in the broader perspective, which constitutes a tool that help us understand complex systems (Senge, 2006; Kotter, 2007). This feedback and guidance can be given for example through a nonlinear leadership, which imply more dialogue and learning (Ainalem et al., 2012:58).

There are benefits with feedback, such as the importance of feedback for better learning, and this improved learning has long been recognized not only in ST but also by psychologists and
within constructive feedback (Cannon & Witherspoon, 2005). Moreover, without continuous feedback, individuals participating in a change process will more likely fail to learn how they need to think and act in order to adapt to a systematic view (Senge, 2006). Organisational feedback culture, characterized by managers and employees feeling comfortable with both providing and receiving feedback, plays an essential role in how individuals seek, perceive, accept, use, and react to both formal and informal feedback (Lukka & Pitkänen, 2011).

2.3.1 Both Formal and Informal Feedback Needed
Both informal and formal feedback is important parts of ST. Informal feedback is the one that occurs spontaneously, voluntary, and undemanding (Lukka & Pitkänen, 2011). This can be for instance discussions, asking questions and reflecting together. This type of feedback, however, requires an active attitude of the individual (Ibid), meaning that it is something we have to seek out actively in order to gain information. Formal feedback is such we can receive automatically from IT-systems or reports, but also the more regularly and obligatory feedback, from example through the form of meetings and performance review. Receiving this latter type of feedback creates a feeling of having competence and personal control, according to Lukka & Pitkänen (2011), which views the motivational reasons for communicating feedback. It is also argued that formal feedback helps participants to make better judgements or predictions. (Ibid) The informal and formal have long been separated but previous research, by among others Lukka & Pitkänen (2011) attempt to extend the discussion of feedback, based on for instance Luckett & Eggleton’s (1991) study, and emphasized, among other, the need of understanding of the collaboration between informal and formal feedback. A reason to why the more formal feedback is dominant could lie in the traditional idea that we need to measure things in order to better control them (Lukka & Pitkänen, 2011:126). In systems thinking, the formal feedback also have a wider meaning, where measures should be derived from the customer (Ibid). For instance this can mean measures such as customers’ satisfaction, which stand in contradiction to the more traditional measures such as those emanating from budgets, discussed previously in this literature review.

2.3.2 Emotions Affect Feedback
The individual behaviour’s impact on feedback in general can be complicated as for instance, both giving and receiving, since feedback can be very personal and that it can be charged with emotion for both givers and receivers. These cognitive and emotional dynamics can affect the
feedback and make the quality of the feedback poorer. Also emotion can make it difficult for givers of feedback to see weaknesses of their own feedback (Cannon & Witherspoon, 2005). Moreover, other individual differences related to the behavioural consequences of feedback are for example age, and experience and self-esteem (Luckett & Eggleton, 1991). Another aspect to be taken into account is that the term feedback traditionally is associated with negative opinions (Senge, 2006:74). Further, the source of feedback is argued to be important, for example technology based feedback seems to be a more reliable source than others (Luckett & Eggleton, 1991), and if the person giving feedback is considered to be an expert, the feedback is easier to accept than if the giver of feedback not is as highly regarded. In large organisations it is also difficult when communication goes through many people (Lukka & Pitkänen, 2011).

2.4. Understanding Complexity

Complexity can be defined as numerous of interdependent links between components in a system (Senge, 2006:71-72), for instance Mella (2012:31) describe it as a high number of variables linked together in nested loops, that are in turn in other loops. This can explain a more dynamic complexity around us, which partly is due to constant changes in the environment and stronger interaction of various actors on the market now (Sterman, 2002). The dynamic complexity implies that even a very small variation, or a well-focused action in one of the variables, is enough to cause huge un-proportionate effects in other parts of the system (Senge, 2006:63; Mella, 2012:273), and the effect can sometimes be where it is least expected (Sterman, 2001). This complex collection of details can easily distract us from seeing patterns and vital connections in our surroundings (Senge, 2006:72) and it also makes it more difficult to judge what the cause of an action will be (Plous, 1993). The cause-effect process usually interacts with many factors on the way, instead of taking the straight direction towards the predicted effect, which is referred to the nonlinear cause and effect relationships discussed by Sterman, (2001; 2002).

This perspective is also a way of starting to deal with deeper problems, through seeing the linkages of interdependency that underlie the actual problem (Senge et al., 1999:45). In other words it is another way of approaching and defining a problem, according to Argyris (1991). It can be described as an ability to understand failures, were starting by the effect and tracing it back in time (Dekker et al., 2011). It will also contribute to an opportunity for sustainable
change by making people develop reflective skills which enables discussions about complex, and conflicting problems (Senge et al., 1999:3-38). A barrier to this lies in people’s habit to solve a problem by automatically creating a frame for the problem, which prevents them from finding a proper solution (Bazerman & Moore, 2009:45).

2.4.1 What Obstruct Individuals to Understand This?
How we see the world and make decisions is regarded not to correspond to the dynamic conditions in which we live. For instance Sterman (2002) notes that we tend to use mental models that are static, rather narrow and based on reductionism, in a world that are regarded to be dynamic, evolving and interrelated. The usage of mental models not corresponding to the surroundings can act as barriers for humans to understand complexity (Senge, 2006:63). Humans tend to naturally simplify complexity (Bazerman & Moore, 2009:42), and usually lack ability to pay attention to every little piece of information. Another way humans use simplifications is to rely on the heuristics, described as simplified strategies or rules of thumbs (p. 6). Heuristics can be efficient tools in judging complex situations, but they can also become inappropriate assumptions for judgements in some situations (p. 14). Those biases can be referred to what is called bounded awareness, described as “focusing failures”, implying the cognitive limitations of humans where we tend to miss important and obvious information and thus filtering away key information (p. 6). Research points to other aspects that can obstruct this understanding. For example the linear way of thinking can be argue to be the opposite of the nonlinear relationship mentioned earlier (Hornstrup & Loehr-Petersen, 2012:26; Dekker et al., 2011). Hornstrup & Loehr-Petersen, (2012:27) also mean that our earlier experiences from similar situations have great influence of how much, and what, we understand. Already from an early age humans are taught that every event has a single cause and that cause and effects are linear (Sterman, 2001; Plous, 1993). This means that humans are shaped by learning linear thinking in the formal education and thus see what we are prepared to see (Senge, 2006:73).

2.4.2 Multidimensional Thinking
This ability to see the world as a complex system with interdependent relationships can be seen as a fundamental perspective of ST (Sterman, 2002; Mella, 2012:40). However, the ability to do so differs among individuals. Though the interdependency between components in complexity might not possible be fully understand, if we want to understand the world, we cannot limit our self by only observing objects but instead admit that the linkages exists
(Mella, 2012:13). This however, is not always easy. Nonetheless, there are persons however who have the ability to understand and sustain complexity, person that do possess what’s called cognitive complexity, i.e. being multidimensional in their thinking. Multidimensional thinking here refers to the ability to analyse situations with many elements, to take in more information, and to be able to explore links and dynamic relationships among these elements, including environmental factors (Streufert & Swezey, 1986:31; Woike & Aronoff, 1992). This helps the individuals being more certain, and handling difficult and complex situations in a better way (Bruch et al, 1981; Argyris, 1991). Cognitive complexity is regarded to be a part of your personality structure, and to be develop already throughout your childhood (Streufert & Swezey, 1986:33).

2.5 Difficulties with Change Initiatives

In ST reforms, a change in the individual's way of thinking can be necessary (Seddon, 2005:22), even though this of course vary from people to people depending on prior knowledge and personality. With this said, to change culture and way of thinking is demanding because it stretches our personally away from our “comfort zone” (Senge, 2006:272). Therefore, for an individual, being forced to rethink can cause emotional turbulence like stress and internal competitiveness, since it is comprehend as difficult to handle the tension between old loyalties and new imperatives of the change initiative (Senge et al., 1999:13; 199). Both a cognitive and social stress could appear if people don't see a sense of meaning in the change (Weick, 1995). This could also occur if the employees don’t believe that the change is possible, or useful, or if the communicated possible improvements are not credible enough. With this said, one can argue for the importance of helping people in organisations to gain a better understanding of their individual systems, as well as how the proposed change potentially will improve business results (Stensaker & Frankenberg, 2007), making it easier to commit to the change. Kotter (2007) further argues for the need of a simple vision to guide people through major change, which is linked to the need to get a common view of relevance created through trust, also discussed by Senge et al. (1999:199).

Furthermore, the understanding of the time it takes to go through a change process is important, combined with what Kotter (2007) calls “short term wins”, making the employees witness small evidence of improvements along the way of the change. Senge et al., (1999:26) highlights ten challenges in three different phases in an organisational change process using a
pilot group. At the start there are four points of essence; 1) to make sure that the pilot members participating in the change have adequate time to be able to reflect and practice, 2) that they get enough help and coaching 3) making the change and new efforts relevant to business goals and 4) not “walking the talk” which refers to the challenge for managers to be committed to the change and understand the challenges. Further, the challenges of sustaining the strengths of change refers to; 5) the challenge of fear and anxiety triggered by increased level of openness and low level of trust among pilot group members, 6) difficulties in measuring and 7) the challenge of isolation from the rest of the organisation, and resistance by people outside the group. Finally, after the project of pilot group has come to an end there are three important areas to focus on: 8) the challenge of prevailing governance structure, and making the structure support the change, 9) challenge how to transfer knowledge around in the system, and 10) the challenge of organisational strategy and purpose, to rethink the strategy and business focus (Senge et al, 1999:26). ST reforms differ from general change initiatives in that sense that it is regarded to be a way of how individuals, i.e. the employees in the organisations, are thinking about their surroundings, both in professional and personal life, and by that it could encourage a shift in mind (Senge et al., 1999).

2.5.1 Why Systems Thinking can be Difficult to Implement

The ST literature assumes that the concept of a system is useful in management and organisational research, according to Louma et al. (2011) and despite the growing awareness of and support for ST, especially in public services, implementation of effective systems approaches remains challenging (Stacey et al., 2000; McKelvey, 1999). Stacey et al., (2000, p. 395) have questioned ST and suggests that a system can only evolve, and develop spontaneously, where there is diversity and deviance, something that goes against the command-and-control school who demand compliance from their pupils. As the command and control principles still evolves, this of course becomes problematic for those organisations who uses it. An alternative to ST presented by Stacey et al., (2000) are the theory of complex responsive processes (CRP), which focus more on the micro-behavioural phenomena and local interactions in organisations, in contrast to ST. Meanwhile, Louma et al., (2011) argue that ST and the CRP perspective could be seen as complementary.

Other difficulties with ST lies in the role of the leader. Leaders’ mission would be to develop the organisation, and create opportunities for employees to learn, and to continuously develop their ability to understand complexity, clarify the vision and improve common mindsets,
rather than the traditional way of giving orders (Ainalem et al., 2012:51). Leadership in ST implies to coordinate understandings, expectations, emotions, and efforts in a continuously interplay between internal and external actors of the organisation (Hornstrup & Loehr-Petersen, 2012:69). In other words, leadership play a key role in sustaining change and is based on a more process oriented and dynamic organisational understanding, where the leader is required to change its way of thinking first, and then together with the employees see the organisations as a system (Sarv, 2008, cited in Ainalem et al., 2012:52). However, as discussed, it is difficult for a leader to be able impact a large and fast growing organization, so that all different parts in the organisation are included and all managers live this philosophy (Senge et al., 1999:161). What's needed is, so called “walking the talk- managers” who are committed to change, and who need be prepared for, and to handle, cynicism (Senge et al., 1999:26). Further, Ackoff (2006) also discusses the importance of the leader arguing that one of the reasons for not adopting ST and failure to achieve individual learning, is due to leaders that lack proper knowledge, and understandings of ST. This is partly due to the fact that very little of our literature and lectures are aimed at potential users Ackoff (2006). Ackoff (2006) further argues that more research has to be made and published, and more conferences held in order to encourage ST in organisations. Another challenge lies in the fact that ST must be learned gradually through practice and continual improvements (Mella, 2012:7). However, there are different learning styles, hence different ways of how people receive information. For example, Barbe & Milone (1981, cited in Felder & Silverman, 1988:676) argue for the visual learning style to be the most dominant. Visual learners remember information best through seeing sights, pictures, symbols, timelines, diagrams and other visual aids (Felder & Silverman, 1988).

2.6 Summary of Theory

Systems theory and having a ST mindset, is important if one wants to recognize new realities and be adaptive to an increasing complex society. It is argued to be important as the traditional structure is regarded to be out-dated and as we need to understand the world as a whole system with interdependent relationships between components. A theoretical framework consisting three parts is used. The first part of ST that consists in obtaining a holistic view, is regarded to be the most crucial part, implying the ability to see the whole and having a collaborative outside-in perspective is an essential part. However, there are structural barriers for humans to understand this. Continuously, both formal (e.g. measures), and
informal (e.g. open discussions) feedback is described as a tool to understand the system. Both type of feedback increases learning and motivation but can be difficult due to emotional barriers of perception and of giving feedback. The last part of the theoretical framework, seeing interrelations in complexity, is important as we need to understand that cause and effect are nonlinear, meaning that the cause process usually interact with many factors. This structure means that a very small action can have a large effect, something that is difficult to understand as we normally adopt a linear thinking in an early age. This last part is expected to be the most difficult to grasp, based on the intangible nature of this area.

ST might requires a change in the individual's way of thinking, which can be demanding. However, the fact that it seems to requires the involvement of the individual, makes it important to understand the perceptions and learning of individuals who participating in the change towards ST. Leaders can be expected to have a big role to play in this, firstly by provide guidance and keeping the employee in the right direction, and secondly to create conditions for individual development and understanding of the whole rather than the traditional way of controlling.
3. Methodology

3.1 The Aim of the Study

The aim of this study was to get a deeper understanding of the employee perceptions of the change process towards ST, and to answer our research question. This was done through conducting semi-structured interviews with 16 employees, asking questions based on the theoretical framework (See 2.1) (Yin, 2009:18). Since the process of change is investigated, a comparison is made of the respondents’ perception before, and after the ST reform (Saunders et al., 2009). This means to capture the change of employees mind and acting, and try to understand how this new way of working is perceived by the employees themselves. The method of implementing a longitudinal study over a given period would have been too time consuming given the time-scope of this work. However, as the respondents might forgotten things of what happened in the past, this was taken into account when constructing the interview guide, and conducting interviews (Saunders et al., 2009:155).

3.2 The Theoretical Framework

For the literature review, secondary data was collected from reports, sector annual publications, journals and few online media sources. Uppsala University library, and Business Source Premier were the primary search engines for journals, and search terms have mainly been “systems thinking”, “implementation of systems thinking”, “systems thinking complexity” and “systems thinking feedback”. As ST is a wide concept, and therefore has a widely spread literature, our focus has been on the business literature within the subject. To use a few older sources was judged to be relevant as ST is a relatively old concept. There are also some sources that arises from practitioners like Seddon (2005), although they are used only to a limited extent due to the absence of theoretical anchorage. Furthermore, a few governmental reports (Stigendal, 2010; the council of innovation, 2012) were used as inspirational guidance since the information was regarded to be relevant and the sources useful as an indication of work done within the subject. Data was collected until the literature review was judged to be anchored, meaning that additional data of the main concepts that could contribute to the study, were not to be found (Saunders et al., 2009).

Following the literature review, a theoretical framework was created based on the existing literature on the subject. The theoretical framework function as a base throughout the whole study. The selection of the three fundamental parts in the framework is also based on advices
and opinions from influential practitioners in the area, as well as a senior lecturer’s advice, in order to increase the validity of this study. The division into the three parts was made in order to create comprehensiveness, and together they reflect the concept of ST. Thereby, the model framework become a helpful tool in order to be able to intercept the respondents’ experience and change process towards adopting a ST mindset. The three parts should not be evaluated separately, but instead the collected experience of all parts, and the change towards them, could be interchanged. Reason for this is that all three parts are tightly linked, as mentioned.

The secondary data report constituted of reports written by the organisations themselves, about their work with ST and are referred to as e.g. “Police Authority, 2014”. They were mainly used to support the authors own empirical findings, but were also helpful in the very beginning of the research in order to get a better picture of the subject and what the organisations had done as well as how they had worked with ST reforms.

3.3 Sample Selection

Respondents to the study were employees from four different public organisations; The Police in Gävle, The Tax Agency in Västerås, Home Care in Sundsvall, and The Migration board in Stockholm. Firstly, the reason to perform the study on organisations within the public sector are because the public sector in Sweden are in need of a new way of operating and they are dealing with many challenges regarding for example collaboration among authorities (Police Authority, 2014). There are also signs of growing awareness of and support for ST in the public services (Stacey et al., 2000; McKelvey, 1999). Modern public organisations encompasses a complex system of actors including governmental entities at the international, national, regional, and local levels, sometimes a diverse aggregation of nongovernmental organisations such as foundations, special interest groups and partnerships and businesses, as well as citizen. Secondly, public organisations are normally more generous with their transparency and constitute of an easier access when it comes to information dissipation and possibility to perform interviews. Each organisation participating in this study had have written reports handed in to The Swedish National Financial Management Authority (ESV), and the authority per see have also published documental papers and research on the subject on their web page, contributing to a knowledge of that they actually work with ST reforms. This information would possibly have been more difficult to acquire about private companies, which was another reason for choosing public organisations as study object. Lastly, the organisations were all found with help of our professional network (Marshall, 1996:523). This
type of sampling is referred to as a convenience sampling technique, and the rationale behind using this is explained by the relatively few number of organisation that have been involved in change processes towards ST (Saunders et al., 2009:233). Though, using convenience sampling, the list ought to be relatively all-comprising for Sweden.

3.3.1 Why Four Different Organisations?
The aim with the study was to see how the individual perceive a ST reform, whereby it was judged to be independable of type of organisation. The criteria were therefore only that the respondents have been participated in a ST reform and preferably that the organisations had worked with the reform in similar ways. All organisations were participating in a project initiated in 2012 by The Council of Innovation, and now led by The Swedish National Financial Management Authority (ESV). The type of reforms for those four organisations was therefore judged to be of similar characteristics. Secondly, the authors thought it would be a good idea to interview employees from different organisations, within different branches, in order to get heterogeneous groups, to make the results more generalizable (Kvale & Brinkmann, 2009), but also to get different perspectives. One can of course argue that certain educational backgrounds would be better at training ST more than others. However, as the aim of this study was to identify key factors helpful in ST reforms, it was ought to be rather general for employees. Though, if there were any differences found between for example home care nurses and tax lawyers, it was judged to possibly add an additional perspective of the findings, and therefore interesting to include in the study. Thirdly, there were not enough people involved in one project, and that would be able to participate in our study. The reason for this is because the ST reforms are initiated by a pilot project with limited members (see Table B for more information about the project in each organisation). Hence, for the reasons discussed above, four organisations were contacted, giving us an appropriate number of respondents for the frame of this study (Saunders et al., 2009).

3.3.2 Similarities among the Four Organisations
The four public organisations, which fulfilled the required criteria presented above, were contacted. All four organisations are operating in the Swedish public sector, characterized by strong functional hierarchy, and they have actively been working with the implementation of ST. Common for all organisations are the background to the initiative as the part of a larger project initiated by ESV. The purpose of the projects is to develop, test and follow up a ST based system for management and control (Police authority, 2014). Furthermore all
organisations implemented the perspective on a smaller group, using a consultant and the same method of implementation. The method used is said to help service organisations to change from the traditional, hierarchical and functional structure command and control, to a more system design, and the method is composed by three steps; Check, Plan and Do, in that order (Vanguard education limited, 2001). The first step is, among other things, to build up confidence in taking action for change, the second step is for identify points for change and the third is a step to take action, and after that going back to check (Vanguard education limited, 2001). Awareness exists of the use of the same method could lead to the existence of similarities among the participant. Also important to mention is the fact that all participants of the pilot projects was relieved with some of their normal work tasks during this period of trial (Elvén, 2014; Swan & Blusi, 2013:5; Police authority, 2014). When looking at the individuals, the organisational structure or methods becomes less important which makes it more transferable to other situations (see Table A for more information about the project in each organisation).

3.3.2 Table A. Brief Information of the Projects

Below a table of collected information of the pilot project in the organisations are presented.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Location</th>
<th>Start period</th>
<th>Nr. of participants</th>
<th>Department for the pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Home Care</td>
<td>Sundsvall</td>
<td>March, 2012.</td>
<td>9</td>
<td>Skinnsmen Elderly Care</td>
</tr>
<tr>
<td>The Police</td>
<td>Gävle</td>
<td>March, 2013.</td>
<td>4</td>
<td>Youth crime</td>
</tr>
<tr>
<td>The Tax Agency</td>
<td>Västerås</td>
<td>November 2013.</td>
<td>8</td>
<td>New corporations</td>
</tr>
<tr>
<td>The Migration Board</td>
<td>Stockholm</td>
<td>August, 2013.</td>
<td>4</td>
<td>Work-permit</td>
</tr>
</tbody>
</table>

Table B summaries brief information of the participated organisations project of implementing systems thinking.

3.3.3 Who are the Respondents?

In total 16 respondents from the four different organisations, fulfilling the criteria of actively and recently have been participating in an implementation ST reform, were chosen. They had various background, experience and positions in order to create heterogeneous groups, to make the results more generalizable (Kvale & Brinkmann, 2009). A desire was also to have respondents with different positions as it ought to influence the person's perception of change. These hypothesis was made after the literature review, firstly, the role of leaders seem to play an extensive role in ST, and second, because personal abilities were suggested to affect the perception of change and one can argue for leaders to possibly have some different characteristics. Also, they was ought to might have different experience, which could affect the results. Consequently, half of the respondents were considered to have a managerial
position at some point. This could be anything between a first line leaders to a project manager. The individuals were chosen by our contact person in each organisation. The fact that the participant individuals have been chosen to pilot groups in their respective organisation might imply that the individuals are more positive towards the change, which can affect the results of the study. To attempt to remedy this problem, all the respondents were kept anonymous. This was made in order to have the individuals to talk freely about their emotions and perceptions (Saunders et al., 2009), and to get personal professional opinions of the respondents and not their opinions as a representative of their respectively organisation. The belief was also that more people would be willing to take part of the study if they were able to stay anonymous (Patton, 2001).

3.3.4. Information about the Respondents

### Table A. List of respondents

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Location</th>
<th>Position</th>
<th>Date 2014</th>
<th>Lengths</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Care</td>
<td>Smedvall</td>
<td>Area commander</td>
<td>March 19.</td>
<td>01:02</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Home Care</td>
<td>Smedvall</td>
<td>Project manager</td>
<td>March 19.</td>
<td>01:00</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Home Care</td>
<td>Smedvall</td>
<td>Assistant nurse</td>
<td>March 19.</td>
<td>01:00</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Home Care</td>
<td>Smedvall</td>
<td>Assistant nurse</td>
<td>March 19.</td>
<td>00:59</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Home Care</td>
<td>-</td>
<td>Department manager</td>
<td>March 19.</td>
<td>01:10</td>
<td>Telephone</td>
</tr>
<tr>
<td>Police authority</td>
<td>Göteborg</td>
<td>Associate</td>
<td>March 20.</td>
<td>01:05</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Police authority</td>
<td>Göteborg</td>
<td>First line manager</td>
<td>March 20.</td>
<td>01:03</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Police authority</td>
<td>-</td>
<td>Manager</td>
<td>March 20.</td>
<td>00:57</td>
<td>Telephone</td>
</tr>
<tr>
<td>Police authority</td>
<td>-</td>
<td>Business developer</td>
<td>March 26.</td>
<td>01:07</td>
<td>Telephone</td>
</tr>
<tr>
<td>Police authority</td>
<td>-</td>
<td>Project manager</td>
<td>March 31.</td>
<td>01:13</td>
<td>Telephone</td>
</tr>
<tr>
<td>Tax Agency</td>
<td>Västerås</td>
<td>Administrator</td>
<td>March 24.</td>
<td>01:10</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Tax Agency</td>
<td>Västerås</td>
<td>Business developer</td>
<td>March 24.</td>
<td>01:11</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Migration board</td>
<td>Stockholm</td>
<td>Change manager</td>
<td>March 26.</td>
<td>N/A</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Migration board</td>
<td>Stockholm</td>
<td>Change manager</td>
<td>March 26.</td>
<td>01:04</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Migration board</td>
<td>-</td>
<td>Change manager</td>
<td>March 26.</td>
<td>01:07</td>
<td>Telephone</td>
</tr>
<tr>
<td>Migration board</td>
<td>-</td>
<td>Project manager</td>
<td>April 9.</td>
<td>01:08</td>
<td>Telephone</td>
</tr>
</tbody>
</table>

*Table A contains information about the respondents and details about the interviews.*

3.4 Semi-Structured Interviews

As mentioned earlier, the main source of data was conducted through qualitative methods, a methodology argued to be required for studying people (Bryman and Bell, 2011), which is suitable for study that focus on the individual change. The aim was to conduct all interviews face-to-face, however due to geographical distance and time restriction, six interviews were conducted via telephone (See Table A). The first contact with the respondents was about one week before the interviews, when an introductory e-mail was sent to all the future respondents. Included in the letter was information about the intention of the study, the interview session, their anonymity, as well as general questions about ST. This information
was sent to the respondents in order for them to prepare and feel comfortable, before the interviews. The reason for only having a very short description of the study was so that the respondent’s wouldn’t be able to prepare answers beforehand, hence saying what they “ought to say”, rather than what they actually think.

Semi-structured interviews were chosen in order to encourage the interviewees to talk freely about their own experiences (Bryman & Bell, 2011:472; Patton, 2001). Though, an interview guide was used, it functioned more as a tool for the interviewer to secure that the interview progressed in the right direction, and to make sure that the main questions had been asked. Also, the guide secured that the same set of questions were asked to all respondents, making the analysis of the results easier, thereby increasing the validity to the research (Patton, 2001). The interview guide was mainly based upon the three parts of the theoretical framework. It starts broadly with a presentation of the authors, background questions of them, and two general questions about ST. This followed by 16 questions divided into three parts, where questions 1-6 were constructed based on the part holistic view, questions 7-11 were linked with the part feedback and the last questions, 12-16 were connected to the part understand complexity in the theoretical framework. The last section contains a few questions about leadership. The questions within each part were formed in the same structure in order to facilitate comparisons and not to give priority to any part. Further, the questions were formulated using a language that was easy to understand, and in a way so that the interviewee would not be led in any direction (Bryman & Bell, 2011:472). Finally, the interview was made so that the interviewee had the opportunity to ask questions and comment fully on the topic, and a final catch-all questions was asked in the very end, in case of the respondents being more alert or engaged in the end of the interview comparing to the beginning (Saunders et al., 2009). After a first draft of the interview guide was made it was sent to a practitioner with great knowledge in the area as well as in interview technique, and to our tutor in order to secure the relevance and formulation of the questions (Yin, 2009:72). The final interview guide can be found in Appendix A.

3.4.1 How the Interviews were Conducted and Their Biases

All interviewees were held during a time period of three weeks and were conducted by both of the authors, but with one person posing the questions and the other one taking exhaustively notes that were later used as a base for the empirical findings. Having both of us present enabled us to discuss our individual interpretation, control and interject if the other person had
missed something. Since the questions were about the personal experience and thoughts of the interviewees, their mood, or conditions of the day or week could reflect on how they perceive the change process, whereby we made sure to have most of the interviews in the middle of the week (a more neutral time) to increase the chances of them to be more focused. This since people tend to be a bit more stressed in the beginning of the week, and a bit more tired and thinking of the weekend in the end of it (Saunders et al, 2009). All interviews were held in Swedish. Though this requires carefulness when translating quotes, it also has the advantage of enabling the respondents to express themselves more freely and comfortably in their native language (Translation of main concepts to be found in Appendix A). This is paramount when asking people about their perception and way of thinking as it can require elaborate ways of thinking and nuancing their answers. Hence, this was done in order to increase the reliability.

Before the interview started, all participants were asked for their permission to recording the interview (Saunders et al., 2009). The recorded material, and reports written by the organisations themselves were, together with the taken notes the platform for the analysis about the individual’s perception about the change process. Though it being advantageous to be able to listen to interviews again, to transcribe these was not considered to be economically defendable form a research-perspective as it was not considered to improve the gathering of information. Since our study captures how individuals experienced their change process, it was their own feelings, and interpretations of their surroundings that were in focus. Awareness exists of that it sometimes might be difficult for the individual to actually be sure of the correlation between an event and method (i.e. factor), and their individual change process towards ST. In our case, one possible influence could be that the interviewees were often part of a small, close group that had worked with the project of ST intensely for months, whereby they all desired the project to be successful in the eyes of the rest of the organisation. This biased was reduced by being clear about the anonymity in the study, explaining that there were no right and wrong answers, and by emphasising that interviewees should think of their own individual experiences. Furthermore, questions from different perspective were posed, and questions regarding difficulties were posed.

3.5 Data Analysis
The authors of this study have continuously changed direction when findings of new data from literature, or interviews occurred. Hence, the study has emerged in a progressive
dialogue between theoretical assumptions, and empirical findings (Dubois & Gadde, 2002). Moreover, consideration was taking so that the theory section suited the information gathered from the qualitative interviews, meaning some changes were also made after the primary-data collection. This flexibility is also one of the advantages with a research that follow an exploratory research method (Saunders et al, 2009:140). After the primary-data collection was done, the analysis process started. Below a detailed description of that procedure will follow.

3.5.1 Structuring of Empirical Data
Right after the interviews, the notes were checked and structured, in order to not lose any details. Each interview-documentation finally consisted of approximately 2-3 pages of coherent text, representing the respondents’ answers to each question in the interview guide, which mainly followed the structure of our theoretical framework. The respondents were then named with an anonymous code, so that the information from each respondent would be possible to derive later in the analysis, but still treated in a way that were in line with the anonymous principles (Yin, 2009:181). The findings that could not be linked to any of the parts of the model framework were clustered together in themes. The last step was to reproduce the gathered data by picking out the relevant parts, and translating them into English since the collecting data was made in Swedish. The authors focused on the respondent’s emotions and experiences, as well as what has been difficult and what factors that have helped them in the change process. As discussed above, the production is an interpretation, however awareness exist about the importance of being neutral in this part of the study, which is why this study makes use of expressive citations together with our retell (Saunders et al., 2009).

3.5.2 Coding and Grouping Empirical Data
The selection of factors was based on quantification as an indication (amount of respondents mentioned the factor) (Barley, 1986), an appreciation and also how strongly the respondent expressed about the factor. The first step was to encode the notes, first under different more overall themes, and then further it into more specific concepts (Saunders et al., 2009). This was done by first highlighting everything that was regarded to be a factor that could have helped the employee during the ST reform, which was the criteria for being a factor. Each factor found was written down in an Excel sheet, and for each other respondents that expressed the same opinion, this was being marked. This process resulted in approximately 40 factors. Secondly, in order to narrow this down to more specific concepts, we highlighted the
factors that had most support from our respondents and which was regarded to be more specifically to ST. The Authors own impression from the interview of what was regarded to be most helpful, were also taken into account. The Excel chart were a helpful tool for the quantification and thereby weight the degree of their importance. This procedure resulted in nine key factors that were to be used to draw conclusions and answering the research question. In the analysis, the quantification was indicated with different describing words of the amount of respondents agreeing upon the factor, for instance the word “majority” was used if more than 9 out of 16 agreed upon it (The Swedish Encyclopaedia, 2014). The third step was to go through the notes from the interviews one more time, in order to gain a deeper understanding, and appreciation of the expressed sentences and citations in their original context. As the authors had not revisited the interviews for some time, this is deemed to have given a certain distance to the findings, which in turn ought to increase the reliability thereof.

3.5.3 Merge of Empirical Findings and Analysis

The first try of presenting the empirical data was done by using a traditional empirical chapter, declaring the respondents answers, using the structure from the theoretical framework. When afterwards trying to write an analysis chapter, we realized that there were repetitions to a great extent, and the chapters was not communicative enough to read as they constituted of more or less the same information. Hence, in order to present the findings in a more communicative way, and since the identified factors neither seemed to not follow the structure of the theoretical framework, the analysis and empirical parts were consolidated. This was regarded to be more suitable for this type of study, declaring the perceptions of individuals rather than organisations’. Awareness exists of the fact that this method diverge from the more traditional way of writing and that it requires more detailed information about the operationalization process; from interview material to presentation of findings. Although, this new ways of presenting data has been on-going for long, one example is Barley (1986) which new way of presenting data has been influential. The underlying logic of this way of writing was to get an easier to read narrative story and to avoid unnecessary repetition, all to be able to communicate a clear message. This decision was also discussed with our tutor, in order secure the quality of the presented findings.
4. Important Factors in the Change Process

4.1 Introduction to the Findings

The individuals interviewed in this study have participated or are still participating in a ST reform. The majority of the respondents described ST as the ability to see from a broader perspective, which gives a reason to understand holistic view as to be a base of ST. One respondent described it as; “systems thinking for me is to have a holistic approach of the organisation one operates in” (A4N). This is also confirmed by various literature (e.g. Senge 2006:68; Ackoff, 1999; Checkland, 2012). The empirical research indicates that there are some personal differences in adapting to the change and how it is perceived. For example some respondents explained that they felt the thrill and challenge in facing complexity, while others just got frustrated and discouraged. However, many agreed that ST is something anyone can develop. A manager said; “I do very much believe in peoples abilities, that is my foundation philosophy and everyone can develop ST, just not equally fast” (B15L). However those abilities are important for change processes in general, which is why focus on this study rather is on factors of practical kind that can help the employees, specifically in ST reforms. Still, some of them are perhaps valid for change process in general, but they are also important for employees participating in ST reforms. The respondents described their system in similar ways, with exception to branch specific interconnections. They described it as the whole community in the society they were operating, were cooperation with other actors were important. Another description from all respondents were that they saw the users as part of their own system. Hence, their own system has been extended in comparison to how it was before the ST reform, as a consequence of looking outside of what overviewed before.

Beyond, an introduction of the individuals overall experience of the change will be clarified and a discussion of the differences between the organisations as well as between respondents with leader positions and non-leader positions will follow. Thereafter findings will be presented divided in extracted factors that are regarded as important for the individuals ‘change process towards ST. Due to the close connection of the three parts used in the theoretical framework, it appeared to be difficult to present the findings with that structure. Instead, the extracted factors follow a change flow, from what is important in the very start to what is important more lately in an ST reform implementation.
4.1.1 The Employees Overall Experience of the Change

All respondents were positive to the change as they could see the benefits of the new way of thinking and working as well as experienced an increased motivation at work. One associate expressed it as; “it is fun to work now, we have got a reawakening” (B5N), something that seemed to be a collective feeling among the respondents. These benefits support the findings of e.g. Sterman (2002) and Senge (2006) arguing for the positive aspects of ST like increased organisational performance, motivation and individual learning. However, the respondents also confirm the challenges discussed in the literature. Previous literature discusses challenges with change processes in general as well as when a pilot group is chosen. There are for example the cognitive processes and barriers discussed by Weick (1995) and Senge et al. (1999), which communicate emotions of stress, disconnection and internal competitiveness. This further argued by Senge (2006:272) as something that easily becomes a trouble for individuals participating in the change process, as this requires them to go out of their comfort zone. The challenge further seemed to lie in getting the employees to think systemic which challenge the way we are thinking and as well as the present structures, traditions, culture and norms in many organisations today. The traditional structure can, according to literature, limit individuals ability to think broader since it creates a focus on achieving the own departmental goals in potential disfavour for the overall more holistic purpose (Siddons, 2005; Majchrzak & Wang, 1996). Several respondents expressed difficulties in the very start, reacting with feeling of frustration, as it is an unfamiliar way of thinking, but also found it difficult to grasp the bigger picture. One respondent expressed the feeling of being exposed to something new like; “what you did before doesn't count in the same way anymore, which sometimes can lead to a feeling of personal threat” (A2L). Seeing the whole can appeared to be an overwhelming task, sometimes impossible to fully understand. This can probably be explained by the restrictions in the way individuals think and the assumptions they make, discussed by Chapman (2002). Sterman (2007) discussed the mental models used today, which might not be adapted to today’s dynamic environment. One way for humans to deal with this is by simplifying the world around you, using heuristic which is easy and natural to do when humans understanding starts to feel more like a burden (Bazerman & Moore, 2009:6). This could for instance explain the difficulties of grasping the whole, as people then need to go away from these “short-cuts”, which sometimes creates frustration. Other respondents described the overall change process as giving headache and problems regarding the new concepts about ST as well as problem with the new statistics that they were aimed to use (D13N). This shows that even something fundamental and relatively easy to grasp like
collecting feedback from users rather than other old measurements, seems to be difficult, which support the findings of general change challenges discussed by Senge et al., (1999). Despite the fact that some respondents confirmed the difficulties with giving and receiving feedback, they didn’t think of it as the most difficult part of ST. Although, many confirmed that they have been better on giving feedback due to their work with ST.

4.1.2. Differences among Organisations and Respondents
The samples of respondents were allocated so that half of the respondents possessed some type of leadership position, which could be everything from first-line leaders to project managers. The reason for this lied in the fact that the authors had hypothesis of that the experience and perception of the ST reform would possibly differ depending on position within the organisation. One reason for this is that leaders were assumed to already have more holistic view, had for longer been trained to think outside their own working task, and were more likely to have participated in more education related activities. Our study does not show any specifically differences of what factors leaders and non-leaders thought were helpful, neither were there differences between organisations. With that said, no patterns were to be seen here. However, it was difficult to ignore the different way of thinking and speaking between the respondents, especially between people with leader positions and non-leader positions. It appeared to be so that those respondents having a leader position could talk more freely about ST, showing a greater knowledge of ST theories but also they could express themselves better with concepts known in ST. This could possibly have to do with the fact that employees higher up in the hierarchical level, have a consensus view as a result of more networking, within and outside their own organisation, and as they have received more theoretical education. Respondents working closer to the users had another way of talking, focusing more on their own experience and feelings rather than talking from an overall, organisational perspective. This might have to do with the fact that their work normally involves less cooperation with different actors, as well as they have got less education of ST.

4.2 Helpful Tools in the Change Process
4.2.1 Factor 1. Open Climate
The interviewees participated in this study all agreed about the importance of feedback as an essential part of system thinking, but also, more importantly, considerably crucial to their own development process towards acting and thinking from a broader perspective. A common
experience among the respondents was that the organisations in general had a more open climate and increased frequency of giving feedback. It also helped them not to fall back to the old routines, which seemed to be especially important in the implementation phase. One associate explains the benefits like “you need feedback to know if you spend time on right things. It helps me to make choices and is also good for my personal development and to keep the fire burning. Without feedback it is easy to fall back in the old mindset” (B5N). This support Senge’s (2006) argument that continuous feedback is necessary for the individuals participating in a ST reform, in order to adapt to a systematic view. As mentioned, a majority of the respondents expressed a positive attitude towards the social, informal feedback. This type of feedback implies in an open climate where the employees have started to value informal meetings as a platform for information and follow-ups. It can easily and on a naturally way can be discussed, as well as it makes it easier for employees who have been very reserved, now to step forward. This contributed to a deeper understanding and increase the analytical capability. One respondent expressed the continuously feedback like; “feedback is to tell something to someone. The positive thing about it is that it is a way of learning, to get better at something. If you don’t get that feedback you don’t know where you are heading” (C8L). This type of feedback with daily discussion also force the individuals to formulate the input in words, which according to one manager increases the responsibility for what each person think and how they express themselves. Many of them pointed to the fact that working in tight project groups, having a common method and a common goal, also contribute to a more open climate and therefore easier to start discussions now than before. An associate said; “it is easier to give feedback now, to tell your colleagues as we have a climate that promote communication, it is easier to find focus” (B5N). One interesting method explained by one respondent, is a “game” with a ball that goes around to all participants with the aim to give the other one feedback. This is an example of how to create feedback culture within the working group and to create the habit of giving feedback, so that it won’t be forgotten. Lukka & Pitkänen (2011) arguing that how individuals seek, perceive, accept, use, and react to informal feedback, are affected by organisational feedback culture. The open climate further seemed to have encouraged curiosity and to have physiological consequences, making the individuals more comfortable giving negative feedback. For example one respondent expressed it like; “you get calmer with a continuous feedback and there is more peace in the group, they feel comfortable in that they do a good job. Earlier there was an anxiety over that” (A1L). The increased feedback climate and continuous feedback from user also appeared to contribute to increased motivation, a feeling of being important as well as
with higher commitment at work. The emotional difficulties with informal feedback discussed by Cannon & Witherspoon (2005) and Luckett & Eggleton (1991) were only mentioned by few of the respondents and those who mentioned it perceived that this type of feedback to causes emotions misunderstandings.

4.2.2 Factor 2. Educational Base

A positive attitude from start makes the whole process easier, according to many respondents. For example a good introduction can create interest and willingness as well as avert the feeling of being forced into something, argued by the respondents. Hence, the importance of getting enough help and support in the initial phase of the change process argued by Senge et al. (1999:26), are supported by our findings. According to the respondents, preparation related training and information like explaining why the chosen group got elected, to get information about the direction and aim of the project and having a positive and trustworthy person who introduce the new way of thinking, is important. For example, the majority of the interviewees thought that a consultant was a reliable person to introduce the change needed, and thereby an important part in their individual change process in order to make the start thoroughly. One respondent explained; "the consultant looked at things we do every day and asked questions I never had reflected over before. He asked about the purpose and why, questions we did not have any answers to. He asked; do you know when you've done a great job? Neither that we had any answers to. Somewhere there I started to think" (C7N). This supports the findings of Ackoff (2006), arguing for the lack of proper deep-knowledge of the subject, which is why a consultant can be favourable in the beginning. A person from outside the organisation is also considered to be a source of motivation and inspiration, as well as he or she has higher legitimacy, according to the respondents. This can be explained by the theories of cognitive and social process, which creates bad patient if we don't see a sense of meaning in the change (Weick, 1995; Senge et al., 1999).

Half of the respondents also explained that they appreciated education in order to gain a better understanding of the perspective. Education can in this case mean both a theoretical base as well as examples from reality. As described by an respondent; “The education was important, there we got example from other parts of the society and not just our own organisation. Example gave us insight in thinking of the real problem, for instance a whole in the ground; either you cover it with new asphalt or you go deeper to the fundamental problem” (B15L). Education could also mean attending a course or conference or receive information during a
long time. The aim for a theoretical base could be explained through that Stensaker & Falkenberg (2007) meaning that a feeling of understanding is an essential explanatory factor for responses to change. However, many respondents especially appreciated to get the basic ideas in a more scientific ways and from well-known practitioners as it makes them understand what it is all about. As one respondents expressed; "I got rather much theory in the beginning, which made me start to understand, to read literature and get education. The entry gate to the understanding was largely theoretical, for me that was important" (D16L). Education also provides vocabulary and a platform to start from. One example can be drawn from a pilot project in one of the organisations, used as a tangible example to show others. Thus, a concluding remark is that how you best receive information very personal, and learning through theoretical sources suits some better than others.

4.2.3 Factor 3. Visual Examples

Visualisation is a helpful tool in understanding and gaining the systemic perspective, according to many respondents. An indication of this was that at least three of the organisations had a “working room” for the project groups, full of posters, drawings, notes and messages etc., which according to the theory can be linked to a certain learning style. This support Felder (1988), arguing that some people are visual learners who find it easier to remember information through pictures, charts, diagrams and timelines etc. According to the respondents, it is easier to reach out with the message using visualization tools, both internally and externally. One clear example is from a manager from the Police, who described ST as; “it is a different way to relate to a task, different from how we did before. We talk more out of the whole and from “Ella”, our symbol for the citizens” (B15L). Thus, a symbol can be something common to relate to, which helps people to remember. Many respondents talked about statistics as a way to visualize, and to get it “black on white”, to see clear evidence of the change. One associate expressed it like; “it is important to have a context and discover it. Also to listen and take in instead of guessing, why it is important to collect statistics, get it black on white, then it is easier to understand and accept” (C7N). This support the findings of Luckett and Eggleton (1991) arguing that this source of feedback is of great importance. Hence, especially feedback from technology systems, like statistics, seems to be reliable among individuals. However, this also contribute to continuously formal feedback, which were appreciated by the respondents. Receiving this type of feedback seemed to create a feeling of having competence and personal control, which views the motivational reasons for communicating feedback. It is also argued in literature, for instance by Lukka &
Pitkänen (2011), that formal feedback help participants to make better judgements or predictions.

4.2.4 Factor 4. Learn About other Parts of the System

Not much is written about collaboration in the literature review, however it appeared to be very important among the respondents, especially as a tool for knowledge exchange, creating an understanding for each other and each others tasks, as well as to create a more holistic view. However, literature (Jackson, 2006; Ackoff, 1999; Gharajedaghi, 1984) argues for the focus on the relationships rather than on the different parts. The increased understanding and knowledge of other actors (individuals, departments, external organisations etc.) in the system were mentioned by the majority of the respondents as something highly valuable, which can be accomplished through collaboration. This could be linked to one of Senge et al. (1999:26) ten challenges with change; to be able to transfer knowledge in the system. In compliance with the interviewees, the understanding of each other’s everyday work is of high relevance, because when you learn how the organisation works, you start to understand the whole system. The knowledge of other parts ease the communication towards other actors, which is something that generates security among employees. One of the respondents expresses it as; “now I dare to be clearer in the communication towards other actors because I know what other organisations do, that is positive” (B6N). This is in line with the theories of Chapman (2002), implying that in order to obtain a wider perspective, one have to collaborate with people that possess different perspectives in order to see the overall purpose. This can be seen as a creator to a wider understanding of relationships within the system and on your own dependency on other parts, which open up for reason to collaborate. According to some individuals this in turn creates a more positive attitude towards each other, more humbleness and more interest (curiosity) towards collaborations as well as for how the organisation is connected, of which support is to be found from literature (Senge, 1999:13). As expressed by a respondents; “collaboration increases all the time and it gives understandings in what I do that affect other parts of the organisations which makes me more humble towards others” (C8L). As within the boundary of the system, there are often some actors outside the own organisation included in your system, as expressed in a report about the intervention (Police authority, 2014), describing that work against youth crime force the Police authority into collaboration with external actors. Collaborate with external actors also makes you understand that working together eases the work of your own; “at start it was very difficult to see (from a broader perspective), which I think has it base out of I having a specific task in my job. Later
I realised that my task can be bigger than that, and to see a broader perspective came when we looked at individuals as a task. Then we saw how it all was connected, and that we can do things together rather than everyone just working with their own part”, said one associate (B5N). Further, talking and working with others makes it clearer that there are chains of events, not only your own part. One manager described that the external collaboration has increased; “the understanding and knowledge of the fact that we actually are in the same system has increased. We always had collaboration with different organisations, but now we have reached another level of it.” (D16L). The literature support that holistic view creates awareness and helps the employees to understand their part in the whole (Senge, 2006:320; Kotter, 2007). This is in conformity with what Senge (2006:344) argues, that to start to see from a wider perspective first requires expanding of the personal boundaries of awareness and to reach outside the own position. However, a problem seemed to be that the traditional organisational work composed a barrier to collaborate and to think wider, according to the respondents. The argument is that you are shaped by the organisation you’re in, by either financial control, budgetary control or just by being encourage to specialise on one thing (e.g. department) from the start. This is supported by Seddon (2005) and Majchrzak & Wang (1996) arguing that the old structure prevents everyone from working towards the overall purpose and this functional mindset, which could be difficult to change. Thus, the existence of structural barriers to collaborate, for example by not naturally having working-tasks together, nor a common places to meet, can create certain way of thinking (Majchrzak & Wang, 1996).

4.2.5 Factor 5. Mapping Creates Knowledge of Interrelations

The complex world we live in can be overwhelming to handle and to understand, complexity can distract us from seeing important connections in our surroundings (Senge, 2006:72). Most of the interviewees agreed upon that they had a complex organisation and further agreed upon that this understanding was essential, which also is supported by the literature (Sterman, 2002:2). One explanation of the understanding the complexity comes from a manager, describing it as “it is the understanding of the reality and that the reality consists of many different parts that all affect each other especially when you want to change the organisation. If you change in one part you have to be aware of effects in other parts, and knowing that if it increases the efficiency in one part it can decrease it in the whole organisation” (D16L), which is similar to the definitions in the literature (Senge, 2006; Mella, 2012). According to Sterman (2001; 2002) this includes being aware of the cause-effect process that usually not taking a straight direction towards a predicted effect, which from the respondents were
regarded as a part of ST. The respondents meant that by thinking this way, you get aware of that the system is bigger than your own position. “For example when I get a phone call about the same problem I had before, now I think one step further about what could happen in the whole chain and not just to solve problem right away” said associate (B6N). Hence, for the individuals this could get too difficult to grasp, since the system can seem to be larger when trying to follow a causal chain back to identify a real source to a problem, whereby the task of handling this problem becomes more difficult than doing it “the old way”. This is discussed by Senge (2006:69) as a feeling that can undermine both confidence and responsibility, by saying “it’s all too complex for me”. These difficulties were according to the literature one reason for why ST weren’t used as much in everyday situations (Dawidowicz, 2012). However, a tool regarded to be helpful in those contexts, in order to get an understanding of interrelations, complexity and dependency, is mapping out your systems, usually through a case of one user. To map out the users issue from the beginning of their inquiry to the end; called to be having the “end-to-end” perspective. Instead of just looking at one case on the department level, this method means to follow the whole story of the user; from the rise of the inquiry until the inquiry was solved and the user satisfied. This was according to a respondent a way of understanding your system; for instance one respondent said; “when we worked on the mapping of the process I understood how many actors that actually were involved” (A3N). It clarifies the flow in the process and it lead to a more holistic view of the user since it includes the “whole story”. By seeing all the different connections and actors that actually affect the process; one respondents expresses the understanding of it as;” I experience that I have more knowledge about my own organisation, which make me understand all the turns and how my work affects other organisations and to in the end come back to my desk” (B5N). This type of help is needed since this understanding of interrelations and complexity can be very difficult, as mentioned earlier. According to Bazerman & Moore (2009:42), one reason for this lies in human’s inability to pay attention to every little relevant piece of information, which leads to a narrowing of focus and whereby humans tend to simplify the situation, instead of fully try to understand it.

By seeing the whole chain of events it is also easier to discover the boundaries of your own system, according to the respondents, which is a way of understanding their own whole. However, it is not always that clear of what a whole is, or how it can be defined, though there are no right or wrongs. Accordingly, the whole can be very different depending on whom you ask, further explained by a manager (D16L); “what are the boundaries for this system? It is
not always that easy to define a system. A system can be different from person to person. Are you an asylum seeker the whole assumable look different than the whole for an employee on a department”. According to Mella (2012), defining the boundaries makes it easier to admit to the interdependency between components in complexity, even though it might not be possible to fully understand, since it makes it possible to react to it. Support for this is to be found among the respondents, one respondent said; ”it is good to try and experiment on what effect things will have, for instance something that seem to be an detail but is shown to be very important, so you need to identify what you need to be careful with. It is hard to tell if I become better to see connections, but I do have better understanding of that it exists connections and that some of them are critical” (A16L). Thus, being aware of the boundaries provides a wider perspective and makes the individuals aware of what they do, affects others. This is also said to lead to the feeling of more responsibility.

4.2.6 Factor 6. Coaching Leaders Ask the Right Questions
Almost all of the respondents mentions leaders in one way or another, were some even found leaders involvement as requirements for a change process to take place. We found support for this the literature (Kotter, 2007; Senge, 2006:320), arguing that leaders on all level need to take an active role and support the change. Further, it is clearly expressed among the respondent that leadership has changed as a result of ST. One extensive change is the shift from controlling the employee, to now becoming a more coaching leader. The close guiding, coaching and directions behaviour do mostly concern middle level managers and is by the respondents said to be an essential factor in order to adapt to the ST perspective. For example, through asking the right questions and make sure that the group is on the right direction. This is needed since it is easy to fall back into the old mindset, if you do not get support and guidance, says the interviewees, which the literature also argue for (Ainalem et al., 2012:51-58; Senge, 2006:320; Kotter, 2007). Further, leaders should help the employee to understand complexity, clarify the vision and develop common mindsets according to Ainalem et al. (2012:51). This is in line with the respondents answers of leaderships focus on creating good conditions (e.g. time and possibility to collaborate), giving more responsibilities to the employee and support them in the change process, which also is supported by Senge (2006:320). More coaching leaders increases the believe in the employee, which were said to be motivating and helpful in the change, according to respondents. One leader expressed it like a more democratic leadership; “From being very hierarchal I’m now more democratic and try to get the employee to get involved earlier in the process” (B11L). The new role of the
leader is also described as a more prestige less leadership, though there is a stronger focus on the employee rather than the leader itself as it used to be. This focus on the employee rather than the leader, is opposing the old way of seeing the employee as powerless and unable to manage change (Senge, 2006:320). As a connection to this, unselfishness was mentioned by the respondent as being important an attribute for leaders; “everyone should be involved, everyone should understand it. Earlier you were satisfied if the leaders got it” (B11L). Senge (2006:320) also implies that as a systemic leader show to believe in the employees by for example giving them more responsibility, as well as it leads to employees wanting to take more responsibility. Here, responsibility seemed to be a very important factor among the respondents, whereby in literature a collective sense of responsibility among the employee is said to aim for the leader, which according to Majchrzak & Wang (1996) leads to higher efficiency. Individuals who feel collectively responsible are willing to work harder, help others and work more as a team according to Majchrzak & Wang (1996).

4.2.7 Factor 7. Acknowledgement from the Top
The coaching and guiding leader mentioned in factor 6, are usually a leader working close to the employees. However, the higher-level leaders are as well regarded to be of great importance. Also in the ST literature, various authors emphasize the general importance of leadership in change processes (Senge, 2006; Ainalem et al, 2012:52-5; Kotter, 2007). The respondents confirm this opinion, and leadership is by some respondents even seen as a foundation for ST to work. Thus, especially acknowledgement from leaders is highly valued by the respondents, which is not to be found argued for in the systemic leader literature, where the leader who coach and guide rather than control, are more emphasized. For high-level leaders, it is their acknowledgement and recognition that the majority of the respondents found very crucial in their change process. The acknowledgement should preferable be an explicit support from the leader where the leader shows that what the employee do is legitimate and important. Our interpretation is that respondents felt very strong about this, and that this type of support were needed in order to be able to stand against the resistance from the other employees in the organisation not working with ST.

The respondents found it important for the leaders to show support in order for the them to stand back the old thinking; “the holistic view is very challenging, that’s why it is especially important that the top management gives us thumbs up”, said manager A14L. Further from the empirical findings, the support gives the individual courage and security in what they do.
A respondents express it as the acknowledgment helps to not fall back in self-analysis and not mistrust the new initiatives (D13N). Thus, if the employees don't get empowerment from higher level they don’t dare to believe in the change and a clear support from the leaders will therefore reduce the anxiety. This was is mentioned by Senge et al. (1999:26) as a challenge in the process of change, arguing that the increased level of openness can trigger those anxiety feelings. Connections to the feeling of getting more motivated if you get attention from the top management, can here be drawn. As expressed by one associate; “it is often we don’t get the support from the leader we needs, then we don’t’ dare to follow through. Then you wonder if you’ve done something wrong and what you need is the leader to let us explain and describe. If not getting encouragement from the management it can be devastating for motivation.” (D13N) This is aligned with Senge et al. (1999), arguing for the importance for the leader to establish a relevance and sense of importance in change processes, in order to create commitment. This is further one challenge in the change process described as “walking the talk” which implies for the importance for the leader to be committed to the change (1999:26). Further, this also support the reasoning of Sarv (2008) who emphasize that leaders need to fully understand the way of thinking first before the they can direct others.

4.2.8 Factor 8. Stop and Reflect

Senge et al. (1999) encouraging reflective depth at work, as it makes people to align their personal aims with the organisations values and aims, as well as it contribute to commitment. From our empirical research, majority of the respondents considered reflection to be of great importance and many said that they desired even more time for reflection in their change process. Reflections can be a form of feedback since it means to pause and question what the next step will be, and to ask yourself and others questions like; how can we do this better and what could have been done in another way?, according to the respondents. Taking a pause from the daily routines and reflect, helped the respondents to accept the feedback around them. One respondent describe it as; ”feedback force you to reflect, to think that maybe this wasn’t that good and with that insight be able to do it better next time. Feedback is reflection.” (B6N). Especially in the initial phase, reflection seemed to be especially important, as those who didn’t spent time on it, appeared not to have developed personally as far as the others. Here, the time dimension discussed by for example Kotter (2007) support the importance of set aside time for reflection in order to fully understand and not taking the challenges of change for granted, referred to what Senge et al., 1999 calls “Walking the talk”. According to the literature (Senge et al, 1999; Senge, 2006) emphasize that a part of ST is to
make people reflect and start to discuss about complex and conflictive issues which also makes people more aware of complexity. Another part of reflection that seemed to be important according to the respondents, are to be reminded. One associate said; “we feel a worry for not reach all the way, you want to take advantage of the knowledge we gained. You cannot delete what you learned, but you have to be reminded all the time” (B5N), this appeared to be important within a working group.

Nearly half of the respondents found it very helpful to share their own experience with others, for example by have a lecture for others and explain to others about their project and change, which can be seen as another type of reflection. This seemed to be especially important as ST is abstract and difficult to grasp, but also since it sounds so obvious in the first place, increasing the importance of explaining its relevance and challenges to others. Accordingly, it seemed to be the process of preparing and sort out the thoughts before the lecture, as well as answer question from people outside the project, that made the employees more convinced and better helped them understand their own thoughts. One respondent explained it like; “for every presentation you do, you get more secure in your own role, you get new questions and new perspectives are shown. You learn from each other and it has developed us in a positive way and gives us confirmation.” (B5N). Presenting for others further requires the individuals to have knowledge enough, who force them into learning, into reflection and to put thoughts into words help the individual to gain a deeper knowledge. One managers said; “I think it is the dialogue, to constantly value the meeting, which has been the most important in my journey towards systems thinking. You have to reach a common understanding and discuss it, which is something that has come gradually. That, and to make sure to include everyone, help you to reach a point that you wouldn't have been able to do by yourself” (A14L). This supports the argument of Senge et al. (1999:26) saying that individuals need to discuss and ally together, which is regarded to be especially important to members in pilot projects who are treated with the challenge of isolation from the rest of the organisation and meet resistance by people outside the group.

4.2.9 Factor 9. New Measurements

Lukka & Pitkänen (2011) argues that ST requires new measures that diverge from the more traditional way of measuring based on for example budgets, to start measures things important for the users instead, such as user satisfaction. The importance to establish new ways of measuring performance are also brought up by majority of the respondents, however
this seems to be difficult; “when you’re measuring new things you have to find the numbers manually and it is difficult to adapt the IT-systems. We would like to measure other things, but it is difficult and it takes time” according to a manager (B15L). It appeared to be difficult to figure out how to connect numerical values aiming to measure “new” parameters. Further, many explained that they normally have to collect statistics manually, which is time-consuming. One respondent explained it like; "measurement is very important, but it is extremely difficult. It is not the measurement in itself that are bad, it is more about how the people use them. Because the measurement were need to be linked with the purpose all the time" (D10N). Hence, many respondents found it frustrating not having a good way to measure new things according to the new formulated vision. Hence, one of the organisations had started to use users satisfaction as their main message. The benefits of for example measure user satisfaction can be explained like the individuals can see the change with their own eyes, giving them constantly “short term wins” discussed by for example Kotter (2007) and Cannon & Witherspoon (2005). In combination IT-based statistics, feedback from users appereed to be a trustful source of feedback according many. For this, no support is to be found from the literature review, although it seems to have helped many employees to obtain a holistic view.

Furthermore, to collect continuous feedback from users appeared to help the respondents to set themselves in the position of the user, which contributed to an outside-in perspective. These facts were supported both by the respondents and by the literature (Seddon, 2005). Further, always having a focus on the user and the knowledge of user demand, ease the change process according to the respondents. For instance one respondent mention an increased degree of responsibility with new measurements; “now we do measure user satisfaction frequently, but before with the old measures we did not even reflect over how to solve the problems, now with the new measurements I feel much more responsibility over that” (A4N). To gain this knowledge appeared to be important to experience the change personally, which majority of the respondents mentioned. By experiencing means for example to do the practical work by yourself, to participate and see with your own eyes, and by that indirectly set yourself in the position of the user. Though personally experience and practice might sound obvious, it seem to not be that easy, especially for managers that are located with more distance from the “production” or the users. This support the findings of Mella (2012:6) arguing that ST must be learned gradually through practice and continual improvements, and that individuals need to see the improvements themselves. Moreover, to get this users focus
and having a clear purpose that describes what is important and valuable for the user, is regarded to be helpful. The fact that a vision or purpose work as a guide in major changes and can make up for a common view of relevance is also supported by the literature (Kotter, 2007; Senge, 1999). This perspective is not always naturally since the traditional functional structure do not have the same focus on the user, it is even expressed to be a structure encouraging a concentration on manager demands rather than user demand.

4.4 Summary of the Results

The empirical research and analysis resulted in a selection of nine factors, discussed above, that are considered important for the individual in order to adopt a ST perspective. The figure below visualize a summary of the factors, divided into five main categories, presented in the order of the process of implementing. That is, the first category is the factor crucial at first and the second category after the initial phase. The categorization was made in order to make the figure more applicable.

The first category, Prerequisites, includes factor 1. Open climate, which describes conditions that eases the implementation but is also factor developed during the implementation. The second category; A good start ensure knowledge, emphasizes the importance of the very start in the change process. Even though respondents received information differently, they found it important to gain a platform of knowledge in the beginning of the process, a knowledge that can be gained from factor 2. Educational base and factor 3. Mapping the system which focus on gaining understanding of complexity and its interdependency as well as factor 4. Learn about the system is seen especially as a tool for knowledge exchange, creating an understanding as well as to widen your perspective and factor 5. Visual examples. The third category is Engaged leadership which highlights the importance of leaders in a change process, after knowledge is gained, includes factor 6. Coaching leaders and 7. Acknowledgement. Next category is Allow time for reflection and emphasize just the importance of creating a culture of frequent reflections, naturally includes factor 8. Reflection. Lastly, develop new measurements, is an activity placed after the other factors is gained and contains factor 9. New measurements and means measure new things, for instance derived from the users.
In order for the individual to adopt to a ST perspective, these nine factors are considered to be helpful, some can be regarded as more general and also be applicable in a general change process, however the nine factors were also regarded to be helpful in a change towards ST. However, out of those nine, three factors did consistently regarded to be most influential and overall considered to be the most important by our interpretation. Further the three who can be more linked specifically with ST. Those three factors are each derived from one of the three parts of the theoretical framework:

→ **Learn about the system**
→ **New measurements**
→ **Mapping the system**

The first factor implies an increased understanding and knowledge of other actors in the systems, a knowledge that can be gained through increased collaboration. This makes individuals understand their part in the system better, and creates more curiosity and interest of other parts. The second factor implies that measurements is a tool with a strong effect on behaviour and thinking. This measurement has a new focus, for instance it can be set from the position of the user. The third factor implies mapping your system, usually by following a case of a user. It is a tool that creates knowledge of correlations, interrelations and dependency in the organisation and clarifies the flow in the process. These three factors help the individual to gain fundamental knowledge of ST, needed in order to adapt to a broader perspective.
6. Concluding Remarks

6.1 Reflections

In undertaking this study on organisations’ practical applications of ST, much valuable and detailed information that was possible to gain. The interviewees of the study all had valuable information, and could transmit unique emotions about their work with ST, in theory as well as practice, as well as about their perception of the change. This has largely contributing to fulfilling the aim of this study, which was to perform research on what factors are perceived to be important for the individual in order to adopt a ST perspective. The similarities between general change literatures discussed by for example Kotter (2007) and Senge et al. (1999), and literature specifically on system thinking, are difficult to ignore. The study combines attributes from general change challenges that often requires the individual to work out the “new” by herself, together with those challenges specifically regarding adopting a systematic perspective and that requires a shift in mind. The emphasis on having a clear mission, committed leadership as well as making allowances for physiological, cognitive processes that requires the employee to see the usefulness and improvements in the change, are central in both fields of literature. In academic research, the individual's experiences and perceptions within this field has not been conducted in the same context earlier, and the method of in-depth interviews with individuals from different Swedish public organizations, with different roles and background, is also a unique contribution.

Another reflection regards the theoretical framework of the study, which was a way to find a working model that could limit the study, and enhance its focus. The framework appears as appropriate as all interviewees saw themselves in the three parts, even though it was sometimes hard to separates the latter. One reflection made by the authors of this study is that it could have been interesting to use Senge’s “ten challenges” (Senge et al., 1999:26) as a framework in the literature review, and compare them to our results. Our findings for instance, support all the ten challenges discussed by Senge et al., (1999:26), even though the ten factors extracted in this study are framed in a somewhat different way, and sometimes more detailed oriented, with narrow examples of what have been important to the respondents. However, using Senge’s “ten challenges” (Senge et al., 1999:26) would have resulted in a comparative study enabling less flexibility. Instead, as the intention of the authors was to be able to exclusively have the perception of the employees as a standpoint, and use their collective view in order to come up with a reinforced answer to the research
question of the study, the initial methodological choice nonetheless appear particularly appropriate.

One reflection from the differences among respondents considered to have leader positions respectively non-leader position, is that there were no general differences of how they valued different helpful factors or their ability to adopt a ST perspective. Also, to find out how respondents acting in practise is something this study did not capture, whereby it is difficult to say more about their respectively adaptation to ST. However, there were differences in how they expressed themselves, which could have to do partly of background such as education, but also that they have received different education of ST and still view things from different perspectives, despite been working with ST reforms. What possible could help this, is to provide more theoretical education to those working closer to the users, and at the same time push for managers or leaders to gain more user experience.

A last concluding reflection is that nearly all respondents were very positive with the new way of thinking and acting, and everyone thought it was needed. While some respondents thought it wasn’t difficult at all, but rather a very natural way of thinking and acting, others thought it was difficult. This support the criticism to ST from e.g. Stacey et al., (2000) and (Mella, 2012) arguing for the need of gradually practice and continual improvements and for the difficulties of having knowledge enough of ST and by that finding a way to learn it.

6.2 Conclusion

The purpose of this paper was to explore the individual change process towards ST, more specifically the employees’ perceptions of important and helpful factors in the adopting of a ST perspective. To fulfil this purpose, the study attempted to answer the following question: What factors are important when implementing Systems Thinking in an organisation in order to get employees commit to individual change and to adopt a Systems Thinking perspective?

To answer the research question, in-depth interviews were conducted with sixteen individuals from four Swedish public organisations, which had participated in a change process towards ST. Our findings support previous literature and ST theories, and much is also to be found in existing change literature, as well as it reveal the difficulties in changing a human’s way of thinking and acting. Respondents also appeared to have different ways of perceiving this
change, though, the perception of the change process has overall been positive, and the new perspective has clearly increased motivation among the employees. The difficulties to grasp the whole picture, and to further understand the complexity in the system, support our expectations of what would be most difficult for the individual perception of ST. Some respondents confirmed the difficulties with giving and receiving feedback, though they didn’t think of it as the most difficult part of ST. Thus, our expectations of feedback as the easiest areas to work on, among the three parts, are also confirmed. Although, respondents appeared to have become better at giving feedback due to the ST reforms.

To answer our research question, the findings from the empirical research resulted in the extraction of five main areas with nine important factors in the change process. (See Figure 1 in 4.4.1). The nine factors can be regarded as rather general and similar to other change literature, they can also vary in strengths and frequency, depending on organisation, and different factors also varied in importance among individuals. However, they could all be seen as helpful tools in getting employees to adopt a ST perspective. Out of the nine factors, three factors are considered to be most fundamental to ST reforms. Those are; learn about other parts of the system, new measurements and mapping the system. These three factors were consistently regarded to be most influential among the respondents, independent of organisation, and should thus be treated as especially in order to get employees committed to change and adopt a ST perspective. The fact that one factor from each part of the theoretical framework is represented supports previous research, arguing for the inseparability as well as importance of each one of the three fundamental parts of ST.

To conclude, we believe that based on our study of employees participating in a change process towards ST from Swedish public organisations, the extracted factors could be useful, as the results also indicates support for previous literature. We argue that it, to a great extent, covers the major challenges for individuals participating in change processes towards ST. We believe this could generate a relevant research contribution to practitioners, and add a better understanding of the individuals’ perception with regards to ST reforms, which, due the wide spread of ST theories discussed by Cabrera et al. (2008) and Checkland (2012), ought to be equally valid in public as well as private organisations.
8. List of References


The police authority in the county of Gävleborg, Police authority 2014. *Slutrapport om intervention med tillämpning av systembaserad styrning*. Version 1.01, Gävleborg, Polismyndigheten


Appendix A. Interview guide.

Inledande presentation: Vi är två studenter som läser mastersprogrammet på Uppsala Universitet och skriver en masteruppsats inom systemsynsätt nu under våren. Det vi bestämt oss för att fokusera på är individens beteende i en förändring mot systemsyn (systems thinking). Vi vill undersöka hur individer kan börja tänka ur ett systemperspektiv, vad som är mer eller mindre svårt och vad som är bidragande faktorer. Allt utgår från en frågeställning som följer; What factors are important when implementing Systems Thinking in an organisation in order to get employees commit to individual change and to adopt a Systems Thinking perspective?

DEL 1. INLEDANDE FRÅGOR

Bakgrundsfrågor. (Namn, yrkesroll, ålder, demografisk härkomst, utbildning)
När kom du i kontakt med systemsynsätt första gången?
- Hade du då hört om begreppet innan? I vilka sammanhang?

Beskrivning av vår syn på systemsyn och hur vi valt att avgränsa det. Vi valt att avgränsa/definiera systemsynsätt utifrån tre delar vi har valt ut tre grundläggande delar: helhetssyn, återkoppling och mönsterigenkännande, som utgör stora och viktiga delar i systemsynsätt. Vi kommer följa den strukturen genom intervjun.

DEL 2. HELHETSSYN (Holistic view)

Fråga 1. Vad betyder helhetssyn för dig?
- Vad är er organisations övergripande syfte? Har det förändrats?
- Hur ser du på din roll i systemet?
- Har dina individuella mål i arbetet förändrats efter införande av systemsyn?

Fråga 2. Om du tänker tillbaka på när du började se organisationen utifrån ett större perspektiv - vad tror du det var som gjorde att du breddade perspektiven?
- Var det något speciell händelse eller metod som påverkade dig personligen?

Fråga 3. Kan du ge exempel på saker du har uppfattat som svåra respektive lättare för att skapa dig en helhetssyn? Krävs det några speciella egenskaper?
- Vilket är, enligt dig, ett bra sätt att få personer att tänka utifrån ett helhetsperspektiv?
- Har du något konkret exempel?

Inom området helhetssyn så har vi inkluderat förståelsen och vikten av relationer och samarbeten inom systemet.

Fråga 4. Upplever du att samarbetet (mellan avdelningar, grupper, individer och nivåer) har förändrats efter införandet av systemsynsätt? Hur?
- Hur viktigt är det att ha förståelse för andra delar av organisationen? Problem/möjligheter?
Fråga 5. Har du ändrat ditt beteende efter att du fått mer förståelse och ökat samarbete med andra avdelningar? Om ja, vad är det som har gjort att du ändrat beteende?
- Har samarbete hjälppt dig i processen att få en helhetssyn?
- Känner du dig ansvarig (och intresserad av) för andra delar av organisationen som du inte kände ansvar för innan? Varför?

Fråga 6. Har helhetssyn hjälppt dig att tänka och agera utifrån ett systemsynsätt? (Dvs. hjälppt dig i förändringsprocessen?)

DEL 3. FEEDBACK/ÅTERKOPPLING
Fråga 7. Vad betyder återkoppling för dig?
- Vad är det som är bra med att få återkoppling? Problem med det?
- Tycker du att det är svårt att ge återkoppling till andra? Varför? Har detta förändrats?
- Funderar du mer nu på vilket sätt du kan hjälpa dina medarbetare? Kan du ge exempel?

Fråga 8. Upplever du att du får återkoppling (dvs. tips, råd och utvärdering) från kollegor och chefer kontinuerligt?
- Har detta förändrats efter införandet av systemsynsätt?
- Får du annan sorts återkoppling idag än tidigare? (ex. mer social/informell)
- Är det nu (mer än tidigare) ett klimat som främjar öppnare dialog?

Fråga 9. Hur påverkar återkoppling ditt beteende?
- Blir du mer motiverad? Varför då?
- Tycker du att den kontinuerliga återkoppling du får gör det lättare för dig att jobba proaktivt, dvs. förebygga framtida händelser/eventuella problem?

Fråga 10. Har ni börjat använda några nya mätetal?
- Hur har det påverkat dig och ditt beteende?

Fråga 11. Har utbyte av erfarenheter och återkoppling (samspel) med dina arbetskamrater hjälppt dig att tänka och agera utifrån ett systemsynsätt? (Dvs. hjälppt dig i förändringsprocessen?)

DEL 4. FÖRSTÅ KOMPLEXITET
Fråga 12. Vad betyder komplexitet för dig?
- Upplever du att er organisation är komplex (dvs. många länkar som är beroende av och påverkar varandra inom systemet)? På vilket sätt?
- Upplever du att det är positivt/viktigt att ha en förståelse för det komplexa i din förändring mot systemsyn? På vilket sätt?

Fråga 13. Tänker du på att allt hänger ihop, att något litet du gör kan ha en stor (ibland oförutsedda) påverkan i en annan del av organisationen?
- Har du lättare för att förstå dessa samband idag jämfört med tidigare? Är det svårt?
Fråga 14. Reflekterar du i ditt vardagliga arbete om hur det du gör påverkar andra delar av systemet? Har det förändrats?

Fråga 15. Har en ökad förståelse lett till att du ändrat ditt beteende?
- Om det uppstår ett stort problem, hur reflekterar du över hur det kan ha uppkommit? Dvs. vart huvudorsaken kommer från?

Fråga 16. Har förståelsen för komplexiteten hjälpit dig att tänka och agera utifrån ett systemsynsätt? (Dvs. hjälpit dig i förändringsprocessen?)

DEL 5a. LEDARSKAPSFRÅGOR TILL ANSTÅLLDA
- Hur viktigt har ledarskapet varit för dig i din personliga förändringsprocess?
- På vilket sätt har det hjälpit dig/påverkat dig? (Vad har varit viktigt)

DEL 5b. SPECIFIKA FRÅGOR TILL CHEFER
- Hur ser du på din leдарroll nu jämfört med tidigare?
- Vad är det svåraste i att som leдер få dina anställda att börja tänka systemsyn?
- Funderar du mer nu på vilket sätt du kan hjälpa dina medarbetare att personligen uppnå bättre resultat?

DEL 6. SLUTFRÅGOR
- Hur kan systemsynsätt påverka tankar eller beteenden i dina ögon? Har du upplevt någon förändring hos dig själv? Hos andra?
- Vad tror du skulle kunna få dig att bli en ännu bättre “systems thinker”?
- Har du något att tillägga?

DEL 7. DICTIONARY
Systemsynsätt: Systems thinking
Helhetssyn/helhets perspektiv: Holistic view
Feedback/återkoppling: Feedback
Förstå komplexitet: Understand complexity
Bredden perspektiven: Broader perspective
Förändringsprocess: Change process
Öppen dialog: Open climate
Samband: connections/linkages
Chef: Leader
Ledarskap: Leadership