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- A Case Study of Municipal ICT Cooperation

Ari Helin

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University of Turku

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ABSTRACT

Changes in society and organisations' business environments have increased the use of operating models, which favour inter-organisational cooperation and networking. The evolution of operating models also has a significant impact on organisations' IT departments and ICT activities. Inter-organisational ICT cooperation and networking offer excellent opportunities to public organisations to develop and improve their operations.

This study clarifies how public organisations in Finland have implemented inter-organisational ICT cooperation. Especially the inter-organisational ICT cooperation between Finnish municipalities has been the target of the current study. The study clarifies why municipalities plan ICT cooperation and how they have implemented it. The study also reviews the benefits that municipalities have received or are seeking to obtain through ICT cooperation. In addition, the study clarifies how inter-municipal IT governance has been implemented and investigates the applicability of currently used theories explaining intra-organisational IT governance to describe inter-organisational IT governance.

The study examines various inter-municipal ICT cooperation groups in Finland. The study reveals that even though municipality groups use many types of ICT cooperation, joint IT governance model-based decisions and clear goals often shine in their absence. The dominant form of collaboration in inter-municipal ICT cooperation is voluntary cooperation without any joint IT governance. The study reveals that without a joint IT governance, municipalities lose much of the benefits they could achieve through a joint IT governance model.

The study also confirms the applicability of currently used theories describing the intra-organisational IT governance to describe inter-organisational IT governance.

KEYWORDS: information technology, IT, IT governance, ITG, information and communication technology, ICT, inter-organisational, public organisations, municipal, ICT cooperation

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TIIVISTELMÄ

Muutokset yhteiskunnassa ja organisaatioiden toimintaympäristöissä ovat lisänneet sellaisten toimintamallien käyttöä, jotka suosivat organisaatioiden yhteistyötä ja verkottumista. Näillä muutoksilla on myös voimakas vaikutus organisaatioiden IT-osastoihin ja ICT-toimintoihin. Uudenlaiset yhteistyön toimintamallit ovat luoneet tarpeen myös eri organisaatioiden yhteiselle IT-hallinnolle. Myös julkishallinnon organisaatioille tällainen yhteistyö tarjoaa hyvät mahdollisuudet kehittää ja tehostaa toimintaansa.

Tässä tutkimuksessa selvitetään, kuinka Suomen julkishallinnossa toteutetaan organisaatioiden välistä ICT-yhteistyötä. Tutkimuskohteena on erityisesti kuntien välinen ICT-yhteistyö. Tutkimuksessa selvitetään, miksi kunnat suunnittelevat ICT-yhteistyötä, miten ne toteuttavat sitä sekä miten tätä yhteistyötä hallitaan. Tutkimuksessa tarkastellaan myös niitä hyötyjä, joita kunnat ovat ICT-yhteistyön avulla saaneet tai pyrkineet saamaan. Lisäksi selvitetään, voidaanko nykyisin käytössä olevia, organisaatioiden sisäistä IT-hallintoa kuvaavia teorioita käyttää kuvaamaan organisaatioiden välistä IT-hallintoa.

Tutkimuksessa on kartoitettu suomalaisten kuntien välisiä ICT-yhteistyöryhmiä. Tutkimuksessa selviää, että vaikka kuntaryhmät tekevät monenlaista ICT-yhteistyötä, niin yhteiseen IT-hallintomalliin perustuvat päätökset ja yhteiset, selkeät tavoitteet loistavat usein poissaolollaan. Kuntien välisessä ICT-yhteistyössä hallitseva yhteistyömalli on vapaaehtoinen yhteistyö ilman yhteistä IT-hallintomallia. Tutkimuksen perusteella voi todeta, että kunnat menettävät suuren osan niistä hyödyistä, jotka ne voisivat saavuttaa yhteisen IT-hallintomallin avulla.

Tutkimus vahvistaa nykyisin käytössä olevien, organisaatioiden sisäistä IT-hallintoa kuvaavien teorioiden käyttökelpoisuuden kuvaamaan organisaatioiden välistä IT-hallintoa.

ASIASANAT: tietotekniikka, IT, IT-hallinto, tieto- ja viestintätekniikka, ICT, organisaatioiden välinen, julkinen sektori, kunta, ICT-yhteistyö

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My original idea was that the doctoral thesis had to be a continuum to my master thesis. However, changes in the situations in my working life and a work project in the university directed me eventually to change the topic of the thesis to a new one, which proved to be extremely interesting and topical one. Many thanks for the continuation of the dissertation project belong to my supervisor, Professor Jukka (Jups) Heikkilä, who took me along to an inter-municipal IT project. This new environment became a central part of my learning and my dissertation project. Big thanks to all not named IT experts, whose work I have been allowed to follow in the project and who I interviewed for my doctoral thesis. The recognition also belongs to Professor of Practice Tomi Dahlberg from whom I learned the skills of writing academic articles when we produced the articles for my dissertation together. Likewise, my thanks belong to Professor Hannu Salmela, who patiently followed and guided my studies from the B.Sc. to D.Sc.

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24.6.2020
Ari Helin

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Explanations of Terms and Phrases

This section clarifies some of the terms and phrases used in the thesis to prevent confusion.

- We have used the terms ‘IT’ and ‘ICT’ interchangeably. International Standards Organization (ISO) defines information technology (IT) as ‘resources used to acquire, process, store and disseminate information’ (ISO/IEC 38500, 2015). Communication technology (CT) is included in forming information and communications technology (ICT); thus, the terms IT and ICT have been used in this dissertation as synonyms depending on the commonly used terms.
- The term ‘public sector’ refers to the government and the local authority activities including, e.g., the healthcare services, social services, local public services and companies owned by the government (Oxford Reference, 2019). Similarly, ‘public services’ are services offered by the public sector.
- We have used the terms ‘intra-organisational’ and ‘inter-organisational’ widely in this dissertation. The term ‘intra-organisational’ describes issues and relationships which are taking place inside an organisation while the term ‘inter-organisational’ describes issues and relationships taking place between organisations.
- With the term ‘IT governance’, we mean various structures and procedures of decision-making. The term ‘IT governance’ includes the sharing of decision-making rights to people and organisations as well as decisions about the topics, which have to be decided. Also, ‘IT governance’ includes how the decisions will be made and who has the rights to make decisions. ‘IT governance’ is associated with the leadership of IT use (Zarvic et al. 2012; Weill & Ross, 2004). ‘IT governance’ must not be confused with ‘IT management’, which focuses on managing IT-related assets and issues on a day-to-day basis and ensuring that governance instructions and decisions are followed. ‘IT governance’ is much broader than ‘IT management’, but they are strongly dependent on each other (Pereira & da Silva, 2012). Since municipal ICT cooperation is very much based on agreements between municipalities about joint targets, structures and decision-making, this thesis focuses on ‘IT governance’.

List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I Helin, A. Inter-organizational IT governance research: A literature review. *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 2019; 10(1), doi:10.4018/IJITBAG.2019010103.

II Dahlberg, T., & Helin, A. Formation of voluntary inter-organizational IT governance for healthcare and social welfare IT - Theoretical background and empirical evaluation. *Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance (ICEGOV2014), Guimarães, Portugal*, October, 2014; doi:10.1145/2691195.2691230: 320-329.

III Helin, A., & Dahlberg, T. Volume, benefits and factors that influence inter-municipal ICT cooperation in relation to ICT-related social services and healthcare services. *Finnish Journal of eHealth and eWelfare (FinJeHeW), 2017;* 9(4), 299-312. doi:10.23996/fjhw.61065.

IV Dahlberg, T., & Helin, A. How IT governance practices contribute to inter-municipal ICT cooperation and its benefits: Indeed, "the emperor has no clothes". *International Journal of IT/Business Alignment and Governance (IJITBAG), 2017;* 8(2), 62-79. doi:10.4018/IJITBAG.

V Helin, A. SECOs as a mean to survive? – Case municipal ICT. *Proceedings of the 9th International Workshop on Software Ecosystem (IWSECO2017), Espoo, Finland;* November, 2017; Retrieved from http://ceur-ws.org/Vol-2053/.

The author of the thesis has also been involved in the following publications which have discussed municipal ICT cooperation:

- Helin, A. Inter-organizational IT Co-operation between municipalities: A literature review. *Proceedings of the 38th Information Systems Research Conference in Scandinavia (IRIS 38)*, Oulu, Finland, August 2015.

- Dahlberg, T. & Helin, A. The emperor with no clothes – Inter-organizational ICT cooperation within municipal regions. *Proceedings of the 6th International Conference Well-being in the Information Society (WIS2016)*, Tampere, Finland, September 2016.

- Dahlberg, T., & Helin, A. Why and how do municipal areas govern inter-organizational ICT cooperation: Indeed, "The emperor has no clothes". *Proceedings of the 25th European Conference on Information Systems (ECIS2017)*, Guimarães, Portugal, June 2017.

1 Introduction

This chapter presents the background of the thesis, declares the motivation and the research gap and presents the research objectives with the research questions (RQs). The chapter also explains the research process, introduces the articles included in the thesis and presents the structure of the thesis.

1.1 Background of the Research

The role of information technology (IT) is crucial in the business and public environment and the status of IT has been widely recognised (e.g. Weill & Ross, 2005; Ali & Green, 2008; De Haes & Van Grembergen, 2009). No companies or public organisations can manage without IT and ICT services, i.e. an organisation's success depends on its IT systems (Sohal & Fitzpatrick, 2002; Ali & Green, 2007; Amali et al., 2014). To be able to use IT systems optimally, IT has to be governed reasonably and professionally and to benefit from their IT investments, organisations attempt to make effective use of IT governance to manage and develop their systems with care (Weill & Ross, 2004; Prasad et al., 2010).

Effective IT governance also improves an organisation's profits (Weill & Ross, 2004), which attracts management interest. Being essential for an organisation's success, IT governance has stabilised its position during the last decades, and it is considered a critical success factor for organisations (Ali & Green, 2007; Lunardi et al., 2014; Zhang et al., 2016). IT governance has been studied mostly from an enterprise perspective; however, the network perspective has received less attention (Trang et al., 2013). The current thesis thus aims to offer a broader view of the topic.

While the role of ICT is becoming increasingly crucial for business organisations (Henderson & Venkatraman, 1999), it is considered essential for municipalities because most of their services are operated using ICT (Flak et al., 2009). In the country of the research, Finland, there were 311 municipalities in 2017 (Ministry of Finance, 2018a). Local authorities in the municipalities are responsible for providing essential services including basic ICT-related services for their residents (The Association of

Finnish Local and Regional Authorities, 2018). According to the Constitution of Finland (Ministry of Justice, 1999), the administration of municipalities is based on the self-government of their residents. This principle includes tasks and issues related to various municipal ICT services. Simultaneously, according to the Constitution (Ministry of Justice, 1999, p. 24),

> a public administrative task may be delegated to others than public authorities only by an Act or by virtue of an Act, if this is necessary for the appropriate performance of the task and if basic rights and liberties, legal remedies and other requirements of good governance are not endangered. However, a task involving the significant exercise of public powers can only be delegated to public authorities.

Based on this statement, municipalities are not allowed to outsource critical services to private enterprises; however, cooperation with other municipalities is possible instead. ICT cooperation between municipalities means sharing some ICT related tasks or services and also sharing corresponding costs and resources between municipalities in question. With the help of ICT cooperation, municipalities strive to cut ICT related costs and improve services. With ICT cooperation, municipalities need some sort of joint IT governance to take care of joint efforts.

There are different sizes of municipalities in Finland. The smallest municipal in Finland has less than 100 residents, while the largest has over 635,000 residents (Population Register Centre Finland, 2018). Due to the different municipal sizes, municipal budgets and resources are different, which affects the services municipalities can provide, including ICT-related services, which differ significantly. While bigger municipalities can maintain ICT departments with tens or even hundreds of people to serve their residents, smaller municipalities sometimes have less than one person to take care of ICT-related services municipal-wide (Ministry of Finance, 2015). It may also seem like several municipalities have not realised the importance of ICT for their current and future success. Still, as municipalities provide most of their services using ICT, they cannot function without ICT.

The need for better municipal ICT is growing due to the long-planned large-scale reform (Ministry of Finance, 2018b) and the need for digitalisation of services. Currently, in the public administration, Finland has been divided into four levels in accordance with the EU NUTS 2016 classification (EUR-Lex, 2003). According to the abovementioned plan, social welfare, healthcare and regional government reform would change the public administration structure and the responsibilities of the different administration levels. While currently, the municipalities are responsible for providing health services in their area (Ministry of Finance, 2019a), the planned reform would transfer responsibilities for all social welfare and healthcare issues to the

regional level (Ministry of Finance, 2019b). According to the proposed reform, more than 50% of the municipal ICT resources, financial and human, would be transferred to the regional level, thus creating a new ICT environment for municipalities with fewer resources and fewer responsibilities. However, the plan is on hold, awaiting decisions by the new government. Nevertheless, municipalities have done a lot of work for planning the use of ICT to prepare for future challenges, which can be utilised in the future.

Currently, municipalities are still keen to do most of their ICT-related activities by themselves and avoid joint efforts. Recent research by the Association of Finnish Local and Regional Authorities (Hyvärinen, 2018) clarifies that only 7% of the municipalities made inter-municipal ICT cooperation. At the same time, 35% of the municipalities arranged their municipal ICT by themselves, and 21% bought some parts of their ICT, mainly PC infrastructure, from external vendors and arranged the rest by themselves. In addition to these options, municipalities have established independent ICT companies for their ICT activities, or they have wholly outsourced their ICT.

Although cooperation has been identified as an effective way to take care of difficult public challenges (McCaffrey et al., 1995; O'Leary & Vij, 2012), few municipalities have started ICT cooperation with other nearby municipalities based on their joint need. Since municipalities are independent in their actions, ICT cooperation often starts voluntarily based on individual interests. However, due to limited resources, cooperation without real and short-term benefits will not be accepted, and it will not be continued or even start. To get the best outcome from the ICT cooperation, municipalities should have a clear strategic intent for cooperation and a mutual understanding of the type of joint ICT or the joint ICT structure, which will be needed.

Globally, research for general inter-municipal cooperation has provided interesting findings. For example, findings on cost savings (e.g. Bel & Warner, 2015), better use of limited resources (e.g. Hophmayer-Tokich & Kliot, 2008) and need for better coordination between municipalities (e.g. Rayle & Zegras, 2013) have been reported. Cooperation regarding various e-Government initiatives has also been studied actively (e.g. Layne & Lee, 2001; Pardo, Gil-Garcia & Burke, 2006; Gil-Garcia, 2012; Flak & Solli-Saether, 2013; Guha & Chakrabarti, 2014). However, research for inter-organizational ICT cooperation among municipalities is still quite rare. (Moon, 2002; Päivärinta & Dertz, 2008; Sorrentino & Ferro, 2008; Ferro & Sorrentino, 2010; Juell-Skielse et al., 2017). Päivärinta and Dertz focused on IT benefits management in Norway (Päivärinta & Dertz, 2008) while Moon focused on the e-government at the municipal level in the US. Ferro and Sorrentino discussed inter-municipal cooperation in Italy and identified five different forms of municipal cooperation (Sorrentino & Ferro, 2008; Ferro & Sorrentino, 2010), which divided the cooperation based

on their status and goals. The five different forms of cooperation are Convention, Framework agreement, Consortium, Limited company and New public body. A Convention means an agreement between public organizations, where the participants agree on the nature of cooperation while a Framework agreement may be, e.g. a joint supply contract. A Consortium is a legally defined form of cooperation with strict regulations for its members. A Limited company and a New public body are independent organizations used by public organizations to fulfil their separately defined tasks. For the Swedish context, the Italian cooperation forms were used (Juell-Skielse et al., 2017), but slight differences were identified. Based on the Swedish research, they proposed a concept of a cooperation model, which includes the forms of cooperation with assumed benefits while participating in a form. In the Swedish case, the Convention form was using a standard specification instead of loose cooperation. The Swedish Consortium mode combines parts of the New public body, and the Consortium (Ferro & Sorrentino, 2010) added with some software service.

The current thesis aims to clarify, how inter-municipal issues such as the reasons for ICT cooperation, the best type of structure for ICT cooperation and the need for a joint, official IT governance have turned out in the Finnish context.

1.2 Motivation and Research Gap

The current thesis addresses the ICT challenges for public organisations, particularly municipalities, i.e. local governments. Municipalities, especially small and medium-sized municipalities, run their ICT services with very limited resources. A small municipality may have no full-time ICT experts in its payroll, and even a medium-sized municipality may only have two to five full-time ICT experts (Dahlberg & Helin, 2017). Nevertheless, several municipalities try to cope with their ICT challenges alone, without any support or help from other municipalities. It seems that several municipalities have not realised the value of ICT for their daily activities. Without cooperation and ICT resource sharing, municipalities may lose the power of joint purchases and the benefits of optimised operations, centralised problem solving, and even possibilities to hire new competent ICT specialists. Digitalisation and e-service development can also be topics in which ICT cooperation with nearby municipalities could help. How much would well-structured inter-municipal ICT cooperation and joint IT governance help to achieve better IT performance for municipalities? This critical question serves as a motivator for our research.

The current thesis also examines the topicality of the relevant theories and the existing research for IT governance. The amount of IT governance research has

grown during the last decade, reflecting the growing interest in and importance of IT governance in recent years. Simultaneously, the operating environment to enterprises and public organisations has changed dramatically. In the past, organisations typically owned their ICT systems and services and operated the ICT themselves, taking care of problems as they arose or addressing the need for development; however, today, this is no longer possible. Technological challenges, new applications, and internal and external pressures for development are often too broad to be handled by a single organisation. This is why organisations are increasingly creating alliances and organisational networks, or they conduct other types of cooperation activities to stay competitive or even survive. However, IT governance research is still mostly done in the intra-organisational environment focusing on the organisation's internal issues (Brown & Magill, 1994; Brown, 1997; Van Grembergen et al., 2004; Brown & Grant, 2005; Xue et al., 2008). While the trend among organisations is favouring inter-organisational cooperation, more research for inter-organisational ICT cooperation is needed. The current state of IT governance research reveals a research gap concerning whether the current IT governance theories which focus mostly on intra-organisational IT governance issues could be extended to cover inter-organisational IT governance issues. This issue raises another motivator for this thesis.

As explained in Chapter 1.1, another motivating factor for this thesis has been the planned social welfare and healthcare reform in Finland. At the time of writing this thesis, the promotion of the reform was still pending. However, owing to the planned reform, broad interest and pressure towards municipal ICT cooperation and joint IT governance have become critical issues in helping municipalities cope with their future challenges. Even without the reform, the interest in the development of inter-municipal ICT has gained new support, thus providing another motivator for our research.

1.3 Research Objectives and RQs

This thesis aims to clarify two objectives. The first objective of the thesis focuses on practical issues of municipal ICT cooperation. As municipalities are independent in their decision-making, issues concerning inter-municipal cooperation create challenges. This thesis thus examines the reasons why municipalities choose to start ICT cooperation and the benefits they expect to receive. The forms of ICT cooperation and IT governance vary in different patterns of municipal ICT cooperation. Because this can have effects on the results of collaboration, the thesis also examines topics such as joint IT governance and the structure of ICT cooperation.

The second objective of the thesis focuses on theories used in intra-organisation (i.e. within an organisation) ICT research and their usefulness in the inter-organisational (i.e. between organisations) context. Existing theories such as the resource-based view (RBV) theory (Barney 1991) and the transaction cost economics (TCE) theory (Coase, 1937; Williamson 1975) are often used in the IT governance research focusing on cooperation within one organisation. In this thesis, we aim to clarify whether these theories can be expanded to an inter-organisational cooperation context. We include TCE theory because it focuses on cost reduction, and we use RBV because it focuses on value increases as the reasons and outcomes of governance. We also include the IT governance practices to determine which inter-organisational governance practices are useful in seeking inter-organisational ICT cooperation benefits. We also aim to clarify the relationship between IT governance practices and the benefits of IT cooperation to understand the interaction between these factors. For this, we studied Granovetter's (1973) social network theory to understand what type of meaning the ties (connections) between social groups have for the IT governance practice deployment and the benefits available from the ICT cooperation.

Based on the abovementioned issues, the objective of this thesis is to increase our knowledge about the inter-organisational ICT cooperation between Finnish municipalities. Also, the aim is to understand the reasons for the municipal collaboration and identify the ICT cooperation benefits and structures and the procedures used to achieve those benefits. In addition, we aim to clarify whether the current theoretical basis for the intra-organizational ICT cooperation can be used in the inter-organisational ICT cooperation context.

To fulfil the research objective, we ask three RQs. The first and the second RQs focus on the practical part of the research objective and the third RQ aims to clarify the theoretical part of the research objective.

In the country of the research (Finland), there are over 300 independent municipalities, which have the legal right to choose their methods of operations, which includes deciding whether to cooperate with their nearby municipalities on ICT issues. As the municipalities vary in size, the number of inhabitants, and their industrial structures and locations, the reasons for cooperation and the number of investments for inter-municipal ICT cooperation vary. RQ1 and RQ2 aim to establish the goals and practices for inter-municipal ICT cooperation:

RQ1 *What reasons do municipalities have for inter-municipal ICT cooperation?*
RQ2 *How is the inter-municipal ICT cooperation governed?*

The TCE, RBV, IT governance practices and Granovetter's (1973) social network theories have been widely used to describe intra-organisational cooperation. To determine whether the abovementioned theories should be used to describe ICT cooperation between organisations, we asked RQ3:

RQ3 *What are the possibilities to explain IT activities between organisations using existing theories about an organization's internal IT governance principles and IT governance benefits?*

RQ3 will test the contribution of TCE, RBV, IT governance practices and Granovetter's (1973) social network theories in the inter-organisational ICT cooperation environment. RQ3 focuses on inter-organisational cooperation and underlines the importance of ICT cooperation between organisations, i.e. municipalities, in this context.

The thesis focuses on municipal ICT cooperation. However, inter-organisational ICT cooperation in the social welfare and healthcare sector has been included in some of our articles because, in some cooperation studies, healthcare units owned or governed by municipalities were also represented.

1.4 Overview of the Data Collection and Articles

This chapter presents an overview of the data collection and introduces the articles. The relations between RQs and related articles will also be clarified.

1.4.1 Data sources, data collection and data processing

In the thesis, all but one article use case studies to determine how and why IT cooperation has been applied in various municipality groups and how theories can be used to explain inter-organisational IT cooperation.

During the data collection period (2015), there were 317 municipalities in Finland, many of which belonged to different municipality groups. To collect research data through interviews, we searched for municipality groups that were focusing on ICT issues in Finland. The municipality groups which were included in the interviews were located in southwestern Finland (Articles III and V), in Pirkanmaa in southern Finland (Article V) and Uusimaa in southern Finland (Article V). Each municipality group consisted of six to eight municipalities, and the number of residents living in these municipalities was between 100k and 360k. The author of the thesis

organised and conducted the interviews (Kvale, 2006) during 2015. The interviewees were officials who were responsible for the ICT-related issues in the municipality or organisation. An interview was also conducted to complement secondary data for the case study of northern Finland (Article III). Table 1 presents information on the dates of the interviews and the interviewees.

Table 1 Interviews and Interviewees

Interviews	Interviewees	Municipality group
27.2.2015	IT service director	south-western Finland
10.3.2015	IT manager	south-western Finland
11.3.2015	IT manager	south-western Finland
12.3.2015	IM director	south-western Finland
13.3.2015	IM manager	south-western Finland
16.3.2015	IM manager	south-western Finland
16.3.2015	IM manager	south-western Finland
24.3.2015	IM director	south-western Finland
17.6.2015	IM director	Uusimaa
15.12.2015	IM director	Pirkanmaa
23.12.2015	ICT director	northern Finland

The same semi-structured questionnaire was used in all the interviews with a list of prepared questions which guided the discussion. Subjects outside of the list were also discussed if interesting issues came out. The interviews, which lasted an average of one and a half hours, were recorded and transcribed according to a transcription reference style. The questionnaire used in the interviews is presented in the Appendix.

The interview questions were targeted towards four core interest areas:
a) The background of the ICT cooperation – to improve the understanding of why and how ICT cooperation has started
b) The practice of the ICT cooperation – to collect information about how ICT cooperation is taking place.
c) The impact of the ICT cooperation – to clarify the effects and possible benefits and challenges of ICT cooperation.
d) The future of the ICT cooperation – to identify the visions and development ideas of ICT cooperation.

Data gathered in Northern Ostrobothnia was based on a study conducted by theother researcher and co-author for Articles II, III and IV. The study follows the formation of IT governance for social welfare and healthcare organisations covering over 100 different organisations including 68 municipalities, five social welfare development districts, five healthcare districts, 33 healthcare centres and nine hospitals in the

Northern Ostrobothnia area. The data were complemented with a nationwide, web-enabled survey emailed to 260 social welfare and healthcare experts to evaluate the proposed arrangement.

The self-collected data were complemented with secondary data from other sources. This secondary data is also based on interviews conducted by other researchers or consultants. The detailed structure or the exact content of these interviews was not available, but the outcomes and the results of the interviews were at our disposal for use as secondary data. The municipality groups which were included in the research using secondary data are located in northern Finland (Article III), Central Finland (Article IV) and nationwide (Articles III, and IV). In the study of northern Finland, nine municipalities and one joint municipal authority in the northern part of Finland were included, and the Central Finland study included 23 municipalities in Central Finland. In the nation-wide study, 144 municipalities from 20 municipal regions were listed, but in the end, only 17 municipal regions were included due to different report contents. These reports were focusing on details not crucial for our study.

In addition to the field data collection, a literature review was conducted to clarify the current state of IT governance research. The literature review is published in Article I. The content and the information of Article I is used as supporting material, adding value to all articles replying to the three RQs.

This thesis aimed to clarify the reasons for inter-municipal ICT cooperation and implementation for inter-organisational IT governance. Articles II, III, IV and V present the research conducted for this topic. Another aim of this thesis was to clarify the form and function of inter-municipal ICT cooperation, and Articles II, III and V present the research for this topic. This thesis also clarifies if the theories and IT governance principles used in the intra-organisational context, i.e. IT governance inside an organisation could also be used in the inter-organisational context. Articles I, II and IV discuss this issue.

Table 2 presents the relations between the Research Questions (RQs) and the articles. The articles which provide relevant answers to the RQs are marked with an 'X'.

Table 2 Research Questions and Related Articles

Article	RQ1	RQ2	RQ3
Article I			X
Article II	X	X	X
Article III	X	X	
Article IV	X		X
Article V	X	X	

1.4.2 The articles included in the thesis

The five articles included in the thesis are as follows:

Article I ‘Inter-Organizational IT Governance Research: A Literature Review’ by Ari Helin (2019).
In this article, we investigate what has been studied about the IT governance between different organisations. This article gives general backing to research for inter-organisational IT governance and provides answers to RQ3.

Article II ‘Formation of Voluntary Inter-Organizational IT Governance for Healthcare and Social Welfare IT – Theoretical Background and Empirical Evaluation’ by Tomi Dahlberg and Ari Helin (2014).
This article investigates the formation of IT governance among municipalities, healthcare and social welfare organisations. We examine the reasons to start a cooperation and the accepted IT governance arrangement. We also examine whether the theories used in the intra-organisational context can be used to explain cooperation in the inter-organisational context. This article finds answers to all three RQs.

Article III ‘Volume, Benefits and Factors that Influence Inter-municipal ICT Cooperation in Relation to ICT-related Social Services and Healthcare Services’ by Ari Helin and Tomi Dahlberg (2017).
In this article, we evaluate how ICT cooperation is carried out in several Finnish municipal regions. For the research, we used nationwide research and three regional studies. The article finds answers to RQ1 and RQ2. This article is an extension of a conference paper (Dahlberg & Helin, 2016).

Article IV ‘How IT Governance Practices Contribute to Inter-Municipal ICT Cooperation and Its benefits: Indeed, “The Emperor Has No Clothes”’ by Tomi Dahlberg and Ari Helin (2017).
In this article, we continue the research of several Finnish municipal regions and link the theory-proposed cooperation benefits to practices detected in the municipal regions. We also extend the theory base of IT governance research to inter-organisational context and show how this theory base can be used empirically. The article also

confirms the role and importance of expectations and benefits which public organisations are looking to establish through ICT cooperation. The article answers RQ1 and RQ3 and is an extension of a conference paper (Dahlberg & Helin, 2017).

Article V 'SECOs as a Mean to Survive? – Case Municipal ICT' by Ari Helin (2017).
In this article, we use empirical research to examine different ICT operating models for inter-municipal ICT cooperation and its impact on the success of ICT cooperation in three different regional settings. The article provides answers to RQ1 and RQ2.

The articles included in the thesis focus on the topic of municipal ICT cooperation and IT governance. Additional articles discussing the same topic have been created by the author and his colleagues, which include some common elements, e.g. arguments and discussions. The full list of articles is presented in the thesis under the List of Publications.

1.5 The Structure of the Thesis

The thesis consists of two parts. Part One is divided into five chapters. Chapter 1 presents the background to the research, introduces the motivation and the research gap, presents the research objectives and the RQs, gives an overview of the data collection and the articles included in the thesis, and introduces the structure of the thesis. Chapter 2 presents the theories used in the thesis, and Chapter 3 introduces the methodology and the process used in the data collection. The author's role in the thesis is also clarified. Chapter 4 presents the articles used in the thesis and discloses the research results. Chapter 5 explains the theoretical and practical implications of the thesis, discusses the limitations of the current research and provides suggestions for future research. Part One concludes with a summary of the thesis.

Part Two contains the research articles and appendix. There are five research articles, including three journal articles (Articles I, III and IV) and two conference papers (Articles II and V).

2 Theoretical Background

This chapter reviews the theoretical background and clarifies the theories, frameworks and definitions used in this thesis. Two theoretical entities (IT governance and inter-organisational cooperation) are considered as the main theories in the thesis. The theories have been chosen due to their extensive use in IS research and due to their expected and tested suitability to network behavioural research as supported by Walsham (Walsham, 2006).

2.1 IT Governance

The term 'IT governance' first appeared in academic discussions during the 1990s (Loh & Venkatraman, 1992; Henderson & Venkatraman, 1999). IT governance is defined as 'specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT' (Weill and Woodham, 2002, p. 1). This was later amended to 'IT governance is the process by which firms align IT actions with their performance goals and assign accountability for those actions, and their outcomes' (Weill and Ross, 2004, p. 1). IT governance is defined by the ISO/IEC standard as a 'system by which the current and future use of IT is directed and controlled' (ISO/IEC 38500, 2015, p. 3).

To identify the current state of IT governance research, we examined the relevant literature. Many definitions, frameworks and general studies have been made in the last two decades. Dahlberg and Kivijärvi (2006) presented an IT governance framework. They introduced an assessment tool to measure its effectiveness, and Peterson (2006) presented a holistic view of IT governance using an IT Governance Assessment Process (ITGAP) model which can be used to measure the effectiveness of IT governance architecture. Van Grembergen and De Haes (2012) focused on essential theories and practices around IT governance, which created the base for their research and practical experiences. Van Grembergen et al. (2004) claimed that the execution of governance takes place through the structure, process and relational mechanism practices. In addition, research related to existing IT governance practices and their impact on performance impact (Ali & Green, 2009, 2012), the maturity of busi-

ness–IT alignment (De Haes & Van Grembergen, 2009) and organisational performance (Turel & Bart, 2014) has been conducted. Research related to the most widely used IT governance practices (De Haes & Van Grembergen, 2009; Almeida et al., 2013) provides a good list of commonly used IT governance practices. The formation of IT governance has been presented in various best practice collections and frameworks, including ITIL (2018), TOGAF 9.2 and COBIT 5. ITIL focuses on IT service management practices while TOGAF is a framework for enterprise architecture. COBIT is a framework for the governance and management of enterprise IT. According to the abovementioned standards, IT governance is part of enterprise governance. In practice, this means that ICT cooperation should bring value to the participating organisations. The best practice methods describe the objects of ICT cooperation which, for municipalities, includes the ICT services they should incorporate into their ICT cooperation. Existing literature (Das & Teng, 2000; Melville, 2004; Park et al., 2004; Wiengarten et al., 2013) have presented some valuable constructs for understanding and delineating inter-organisational IT governance principles and benefits.

Research for IT governance has been rather widespread. IT governance research has generally focused on ICT issues which usually take place inside an organisation. Some studies have focused on IT governance in general (e.g. Anica-Popa, 2012; Leclercq-Vandelannoitte, 2018; Héroux & Fortin, 2013, 2018; Turel & Bart, 2014) while some studies have focused on IT governance framework models such as ITIL (e.g. Iden & Eikebrokk, 2014; Nicho & Al Mourad, 2012) or COBIT (e.g. Abu-Musa, 2009; De Haes & Van Grembergen, 2013; Souza Neto, 2013). A large number of IT governance studies have focused on enterprise IT governance. Some are considered from the audit, or assessment perspective (e.g. Bin-Abbas & Bakry, 2014; Gheorghe, 2011, 2010; Iliescu, 2010) or they take the IT governance improvement perspective (e.g. De Haes & Van Grembergen, 2013; Lombardi et al., 2016; Lorences & Avila, 2013).

There are also IT governance studies, which focus on public organisation IT governance. Although challenges for managerial-level IT issues are similar in the public and private sectors, there are systemic differences between organisations (Campbell et al., 2009) which must be taken into account. Studies for IT governance for public organisations often focus on hospitals (e.g. Bradley et al., 2012; Köbler et al., 2010; Lagsten & Nordström, 2015; Gebre-Mariam & Fruijtier, 2018; Smith et al., 2013) or more widely on public sector organisations (e.g. Ali & Green, 2007; Heindrickson & Santos, 2014; Nfuka & Rusu, 2013; Dawson et al., 2016; Pang, 2014).

Relatively few studies deal with inter-organisational IT governance. For example, Croteau and Bergeron (2009) defined various modes of IT governance that contribute to successful inter-organisational relationships. Prasad et al. (2012) examined

different collaborative organisational structures and identified suitable IT governance structures for them. Zarvic et al. (2012) presented practices for inter-organisational IT governance, and Croteau et al. (2013) identified critical inter-organisational IT governance mechanisms in use. Xiao et al. (2013) investigated the buyer-supplier dyadic relationships and the impact of inter-firm IT governance on information sharing, and Chi et al. (2017) studied the relationship between two inter-firm governance strategies (balancing and complementing governance strategies) and their impact on relational performance.

2.2 Inter-organisational Cooperation Framework

Existing ICT cooperation research in information systems (IS) focuses mainly on intra-organisational cooperation, i.e. cooperation within an organisation. This thesis extends the existing research theme for collaboration between organisations, i.e. municipalities. To identify the current state of inter-organisational ICT cooperation, we examined the relevant literature in Article I.

Inter-organisational cooperation has been widely studied in various business areas such as economics, strategic management, organisational behaviour and sociology of organisations (Borgatti et al., 2003; Zaheer & Venkatraman, 1995; Zaheer et al., 2010). However, in IS research, research focusing on inter-organisational research has been limited. The primary research interest has been towards IT cooperation within one organisation (e.g. Van Grembergen et al., 2004; Van Grembergen & De Haes, 2008; Weill & Ross, 2004). Nevertheless, reasons for cooperation in an inter-organisational structure are often the same as those in an intra-organisational structure, mainly targeting better efficiency and optimised costs.

In Nordic countries, little research has focused on municipal ICT cooperation. In Finland, few research studies could find systematically organised ICT cooperation between municipalities (Hyvönen, 2015; Dahlberg, 2016). In Sweden, a study for cooperation among public organisations around digital archiving systems (Juell-Skielse et al., 2017) discovered five different modes of cooperation with various benefit expectations. A study in the municipal sector in Norway (Päivärinta & Dertz, 2008) identified a set of pre-determinants affecting IT benefits management practices. Overall, in the context of the thesis, inter-organisational IT governance is seen as an arrangement to govern IT as a joint activity.

Several theories and frameworks explain cooperation between organisations and the benefits of collaboration, including a knowledge-based theory of inter-firm collaboration (Grant & Baden-Fuller, 1995) and a dynamic capabilities framework (Teece et al., 1997). However, according to Ebers (1997), organisational cooperation

usually provides two types of benefits: revenue increases and cost reductions. The theories which are typically followed are the resource-based view (RBV) theory (Barney, 1991; Wiengarten et al., 2013) and the transaction cost economics (TCE) theory (Coase, 1937; Williamson, 1975, 1985; Geyskens et al., 2006). The RBV theory addresses adding value and revenue increases from configurations of resources and TCE theory addresses cost reduction from transactions, which are both crucial issues in the municipal sector due to the tightening economic situation. These theories have been actively used in IS research (e.g. Park et al., 2004; Magni et al., 2012-2013; Wiengarten et al., 2013). RBV and TCE separate governance into three levels: single organisation, market and alliance/network (Williamson, 1985; Gulati, 1999; Das & Teng, 2000; Zaheer et al., 2010) and they focus on three themes: alliances, cooperation and their governance. These theories also clarify the link between inter-organisational IT governance and the ICT cooperation benefits.

Inter-organisational ICT cooperation and joint IT governance take place between people in social groups. Thus, it should be clarified how the relations between social groups impact ICT cooperation and IT governance practice usage. Granovetter's (1973) social network theory offers a theoretical basis for explaining the impact of social contacts (i.e. ties) on cooperation. The social network theory is often used because it describes the connections between organisations in networks (Borgatti & Foster, 2003). RBV, TCE and Granovetter's (1973) social network theory is therefore selected for this thesis and are explained in more detail in the following sections.

2.2.1 RBV theory

The RBV approach surfaced in 1959 by E. T. Penrose. Since then, many alternative and complementary models have been developed based on the RBV approach and the research tradition. Barney (1991) introduced RBV to information systems research, which has extensively been used in IS research with a focus on IT business value research (Wiengarten, 2013). RBV keeps every organisation unique in terms of its value creation potential (Barney, 1991; Wiengarten, 2013). Barney (1991) created the VRIN model defining four resource properties which make the resources unique: Valuable, Rare, Imperfectly imitable and Non-substitutable (Barney, 1991). For example, in the municipality context, these may be interpreted as follows:

- Valuable: a municipality can have more tax-paying companies than other nearby municipalities;
- Rare: a municipality has the only university in the area;
- Imperfectly imitable: a municipality has a longer coastline than other nearby municipalities; and

- Non-substitutable: a municipality has the only harbour in the area.

Many value-adding indicators have been identified by RBV research (Wiengarten, 2013; Das & Teng, 2000; Park et al., 2004).

An organisation (a municipality in the context of the thesis) can be described as a wide range of tangible or intangible resources or assets, owned by the organisation or to which the organisation has access at least semi-permanently (Das & Teng, 2000; Geyskens, 2006; Wiengarten, 2013). The value creation potential of an organisation is defined by the organisation's resources or assets, especially those which are imperfectly mobile, non-imitable and non-substitutable (Barney, 1991). The arrangements of how to use resources are included. The following alternatives for the resource usage are considered: own production, sourcing from markets and cooperation. Measures of the value increase identified by RBV research include conserving resources, sharing risks, obtaining information, accessing complementary resources, reducing (product/service) development costs, improving technological capabilities and enhancing reliability (Park et al., 2004).

According to RBV, inter-organisational cooperation is worth implementing if the participants receive more value through cooperation and if the value cannot easily be created through any other governance or operating model. This cooperation may take place through pooling, aggregating, sharing or exchanging their unique resources. According to RBV, the willingness for cooperation is also affected by the trust or lack of trust (Osborn, 1990; Zaheer & Venkatraman, 1995; Das & Teng, 2000; Gereffi, 2005; Park et al., 2004). Trust is an essential requirement in successful inter-organisational IT governance.

RBV focuses on how to increase the value of transactions by using the available resources (Wiengarten, 2013). For example, in the context of the thesis, how can the value and availability of municipal ICT services be increased? According to RBV, there are three different governance models: single organisations, markets and alliances (or networks). The target for alliances, which are voluntary cooperative inter-organisational agreements, is to obtain a competitive advantage for the participants of the alliance (Das & Teng, 2000). IT resources may deliver value to an alliance by creating synergies and higher-level capabilities, enabling long-term performance improvement and demanding a re-design for human resources and facilities (Wiengarten, 2013). IT resources, which can be divided into human and technical resources (Das & Teng, 2000; Melville, 2004), are usually complementary to an organisation's other non-IT and IT resources (Wiengarten, 2013).

In the municipal context, RBV helps to consider options for IT activities. Should a municipality manage all its IT operations alone, without cooperation? Would cooperation with nearby municipalities add value and increase service potential? In case the IT cooperation is selected, to what extent is it done and who will be the optimal partner for the cooperation? Should IT activities only be outsourced and

bought from an external vendor? These are difficult questions faced by every IT manager in municipalities.

2.2.2 TCE theory

TCE theory was introduced in 1937 by R. H. Coase, who used governance structure to describe markets and hierarchies. Differences in transaction costs define the choice between markets and hierarchies more than production costs (Geyskens, 2006). Williamson (1975, 1985) developed TCE by stating that when organisations make decisions about whether to make, buy or ally, they use asset specificity, uncertainty and transaction frequency as the determinants.

The basis of TCE is that, in executing its transactions, an organisation should rely, if possible, on a form of governance that involves the least transaction costs (Williamson, 1985; Geyskens et al., 2006). Municipalities can save costs through ICT cooperation by sharing their limited ICT resources or by reducing their ICT service-related risks. The form of governance should be the best offering with the highest cost savings for all ICT cooperation participants. Various cost-saving measures have been recognised in research (Geyskens et al., 2006).

TCE theory also addresses issues such as where the economic transaction should take place and who should be conducting the transactions. In the municipal cooperation context, this refers to which municipal is the best actor to conduct a specific ICT transaction and where the transaction should take place. Geyskens, Steenkamp and Kumar (Geyskens et al., 2006) introduced two forms of networks/alliances into TCE theory: hierarchical governance and relational governance. Hierarchical governance is the structure in which one partner has the authority to develop rules, give instructions and impose decisions on the other partners. This mode of governance is typical for supply and value chains, where a company controls other partners (Gereffi et al., 2005). Relational governance is a joint activity in which the parties involved jointly develop policies to achieve the defined goals (Geyskens et al., 2006). Transactions between a leading organisation and other partners create hierarchical networks while transactions in networks and alliances form relational governance or networked governance (Williamson, 1985; Wiengarten, 2013). Municipal inter-organisational ICT arrangements, which have been studied throughout the thesis, are relational hierarchies. In relational governance, the role of trust is vital (Geyskens et al., 2006). Trust is needed in the establishment and during the execution of ICT cooperation. Lack of trust has a detrimental effect on ICT cooperation and lowers the results.

According to TCE theory, economic transactions inside an organisation are considered hierarchical governance while transactions between two parties are called market governance (Coase, 1937; Williamson, 1975). Market governance works best when assets used in executing transactions are similar, when the use of assets is large or very small and/or when asset usage uncertainty can be reduced (Williamson, 1985; Geyskens et al., 2006). In the context of a municipal ICT environment, this means that best results will be reached when all participating municipalities have roughly similar ICT services, when the volume of their ICT services is high (or seldom used and expensive) and/or when their ICT cost uncertainties can be reduced by sharing.

TCE provides tools for cost optimising for municipalities. Municipalities should consider which activities are better to keep for themselves and which tasks are better to share or outsource. Municipalities should also determine which of the nearby municipalities would be the best partners for cooperation regarding resources, IT volumes and the type of services provided. While such questions may be difficult, the right conclusions will provide better results for their IT cooperation.

2.2.3 Social network theory

Granovetter (1973) first introduced the social network theory in the 1970s to examine the labour market and study the social processes of job-hunting. The theory was later expanded to macro-level structures in studies for the social embeddedness of institutions (Granovetter, 1985). At that time, it was also noted that markets consist of social rather than economic structures (Baker, 1984). Since that time, social network research has been used in many research areas and disciplines. The social network theory is sometimes seen more as a research approach than a theory (Bögenhold, 2013).

The primary construct in the social network theory is the tie construct (Granovetter, 1973, 1985). The ties describe the information flow between individuals in the same or different social groups, and they enable the trust to be built between groups and individuals (Granovetter, 2005). The ties can be divided into strong tie constructs and weak tie constructs. With the strong tie construct, the social relations inside a social group are meaningful. In a municipality, officials discuss various issues regularly with each other and share the same values, norms, objectives and other similar factors. While doing so, a municipality's identity strengthens, thus creating strong ties within the municipality. In the weak tie construct, the social relations between different social groups are meaningful. Individuals belong to various social groups, where they meet individuals outside their regular social group and discuss and share ideas. This social contact is important because the flow of ideas takes place more

through weak ties than through strong ties (Granovetter, 1985, 2005). Without contacts between individuals from different municipalities (i.e. weak ties), ICT cooperation between municipalities may be scarce or missing entirely. Respectively, if contacts between different municipality groups are frequent and extensive, ICT cooperation may prosper and bring benefits.

The network density and the structural hole (Granovetter, 1973, 1985, 2005) are other constructs related to the weak and strong ties. The strong ties are tight when the network's density is high. However, the density is often low in large networks. A structural hole may exist if there are too strong ties in the network or if the weak ties are missing in the network. This structural hole may be filled by an outsider, who will take care of inter-organisational contacts (Granovetter, 1985, 2005).

Other important constructs in social network theory are the embeddedness of organisations (Granovetter, 2005) and social capital. Embeddedness affects the actions which the organisations take in their operations. The history of relationships between organisations is essential. Depending on the length and scope of the relationships, the actions tend to differ (Zaheer et al., 2010). This social capital defines the value of inter-organisational connections.

Unlike in ICT cooperation, where most of the activities are measured by economic terms, social relationships are mostly non-economic (Granovetter, 1973, 2005). Hence, social indicators should also be included in the measurement of ICT cooperation. The social context may also change the actions taken by organisations (Gulati, 1999).

The social network theory clarifies many important constructs, which helps to understand inter-municipal ICT cooperation. Because of the legal rights for Finnish municipalities to decide and manage their ICT activities and actions independently, differences in operational working ways and wishes for ICT cooperation exist. Small municipalities act as an example here since municipal officials often have strong ties with their local colleagues belonging to the same municipality. Small municipalities may be suspicious about the ideas and actions provided by other municipalities, especially if the nearby municipality is far bigger. Officials in a small municipality may fear that ICT cooperation is the first step towards a merger, which is why all cooperation efforts will be avoided or attenuated. In doing so, they lose all the benefits that a fruitful ICT cooperation may bring.

2.3 Resource Dependency Theory

In addition to the abovementioned theories, this thesis includes another theory because municipalities which take independent actions based on the Constitution are often forced to cooperate to succeed in their activities. The theory, which explains the reasons for this cooperation, is the resource dependency theory (RDT) (Pfeffer & Salancik, 1978). RDT focuses on dependencies between actors. Actors (municipalities, in the context of the thesis) depend on other actors unless they have full control over the activity. RDT states that most of the organisation's results are achieved through a joint operation of interoperable actors. In modern, Western societies, such as countries like Finland, where organisations often cooperate in many different fields to succeed, resource interdependence is a typical way of working. Interdependence should include ICT functions which regularly face resource constraints.

In the municipal context, local ICT managers are facing challenges brought about by efficiency pressures. Often the problems are caused by a large number of external requirements coming from the national government, other administrative authorities or from residents related to new ICT services and applications. Not all of these requirements can be fulfilled due to limited internal resources. These limitations cause challenges for ICT operations and the development of municipal ICT activities. As a solution, some ICT managers have started ICT cooperation with nearby municipalities to extend their limited ICT resources and satisfy the need for new services. With the help of ICT cooperation, ICT managers are able to get support from their colleagues, discuss and share opinions, receive training and consultation, and share resources when possible. Understanding the resource dependencies will thus encourage inter-municipal ICT cooperation.

3 Research Approach and Procedure

This chapter presents the methodology and the research methods used in this thesis. The implementation of the methods for each case is explained separately.

3.1 Methodology

The core of the thesis is to evaluate municipalities in their daily ICT operations with their nearby municipalities. According to the Constitution (Ministry of Justice, 1999), municipalities have the right to decide how they will fulfil their duties towards their residents, taking into account the limitations mentioned in the Constitution. Municipalities differ in size, location and financial possibilities and their residents have different opinions and ideas about how the authorities should manage municipal ICT; thus, various ways to implement municipal ICT operations exist.

The epistemology of the research can be positivist, interpretive or critical (Chua, 1986). In the positivist studies, the research target is assumed fixed and not dependent on people being active and decisive about their affairs (Orlikowski & Baroudi, 1991). In critical studies, a researcher attempts to evaluate and change the research environment critically. In interpretive studies, the world is not fixed, and the researcher attempts to understand how people's actions and decisions affect their environment (Orlikowski & Baroudi, 1991). Also, interpretive research supports IS researchers in understanding human thinking and actions in organizational and social contexts (Klein & Myers, 1999). As Orlikowski and Baroudi (1991) stated, interpretive research in IS supposes the world to be non-standard, where there is always room for interpretation. The goal of interpretivism, then, is to understand the subjective meanings of people (Goldkuhl, 2012). In interpretivism, the theory is used to explain actions. With all actions, there is a meaning and some intention based on social and historical practices (Chua, 1986). The role of the researcher is the outside observer without direct involvement in the focus area (Wahlsham, 1995, 2006). In the research, interviews are actively used as the mean of information collection supplemented by other forms of data when possible. The target is not to report facts but to report the interpretations of the researcher of the interviewees' interpretations. In

the case of municipal ICT operations, where people in charge make decisions about the actions of their municipalities, neither a positivist nor critical approach is feasible. Therefore, the epistemology of this research is interpretivism.

The ontology of interpretive IS system research presumes that the social world is created by people through their actions (Orlikowski & Baroudi, 1991). Organisations and inter-organisational cooperation do not take place unless a living person works to make it possible. People have different ideas, thoughts, comments and decisions; they construct their reality (Walsham, 1995). These differences also affect the expectations for the benefits of municipal ICT cooperation and the implementation of the cooperation. Inter-organisational ICT cooperation between municipalities thus has different embodiments. Therefore, the ontology of the thesis is to understand the municipal ICT operations through real cases and to clarify the reasons for inter-municipal ICT cooperation.

This thesis uses empirical field information collected through various case studies around Finland; these are mainly from municipalities but also healthcare organisations. As the primary research method, interviews were conducted by the author of the thesis or by external consults or other researchers. Also, various documentation, project-meeting memos, participation in the meetings and secondary data have been used for information collection. While research methods have to provide support for finding answers to RQs (Venkatesh et al., 2013), the usage of various research methods is valid. Additionally, according to Mingers (2001), research results may be more valuable and trustworthy when different research methods are used. As Mason (2006) argued, mixing methods provides excellent possibilities for us to understand the social experience better and improve our capabilities for the explanation and generalisation. Thus, for this study, the selection of multiple methods as the research approach is appropriate (Venkatesh et al., 2013).

The case research strategy (Benbasat et al., 1987; Yin, 2009) has been used as the primary research method. According to Yin (2009), the case study is often used in situations where information about groups or organisations is collected. The case study research is usable in IS research for the following three reasons (Benbasat et al., 1987):

a) IS can be studied in a natural setting to learn about the latest transactions in the field and to create theories from practice;

b) ‘how’ and ‘why’ questions can be asked to understand the complexity and nature of the actions; and

c) for areas where only a few studies exist, a case research is suitable. These reasons are appropriate for our research context.

As stated earlier, various independent case studies are used to collect empirical information. The findings from the cases have been reported independently. In our research setting, cases around Finland are used to collect data and answer our RQs.

The most used qualitative research method is an interview (Polkinghorne, 2005; Myers & Newman, 2007) and, in this thesis, interviews are used as the primary information gathering method. Interviews make it possible for a researcher to get to know the participants' specific experiences and their feelings about them (Schultze & Avital, 2011). The interviews, which were conducted by the researchers, used an open-ended, semi-structured questionnaire (Myers & Newman, 2007). The questions were used as a guide and as a checklist for topics to be covered during the interview. Variations were made, and follow-up questions asked depending on the situation and the participants' answers and comments. The questionnaire was pre-tested among qualified researchers and used similarly in all interviews. The names of the interviewees were anonymised to maintain confidentiality. All research data are stored according to the university's guidelines. Data from interviews conducted by external consultants were also collected in the form of research results for use as secondary data.

Case studies can collect data from various sources such as interviews, documentation and observations (Benbasat et al., 1987; Eisenhardt, 1989). In addition to interviews, this thesis uses various other information sources such as project documentation, workshop material, observations and surveys. The information sources are explained in Chapter 3.2 case by case. In Article II, a survey (Pinsonneault & Kraemer, 1993) was also used because it offers the researcher a possibility to complement qualitative research to confirm and quantify the results (Newsted et al., 1998). In Chapter 3.2, where the empirical studies are reviewed, the usage of various data sources is clarified.

3.2 Overview to Research Methods and Research Processes

This section introduces the research methods used in the articles. The research methods for each article are explained separately. If the same case has been used in different articles, its research method has been explained only once.

Article I, 'Inter-Organizational IT Governance Research – A Literature Review', used a systematic, structured literature review process (Webster & Watson, 2002) for data collection. The target of the literature review was to identify the current state of the inter-organisational IT governance among the IS domain. To obtain the latest academic content, the review was limited to articles and conference proceedings published in the last two decades. For the search process, Primo Central Index (Volter, 2018) with references from over 900 databases was used with keywords 'ITG' and 'inter-organizational' and their combinations and synonyms. Additional

search criteria ‘Full text available’, ‘Peer-reviewed’, ‘English language’ and ‘The year of publication from 2000’ were used.

Further, the top eight journals from the AIS Senior Scholars’ Basket of Journals were reviewed. Initially, 210 academic articles and conference proceedings were retrieved. Duplicates, articles with non-matching titles, articles that did not focus on IT governance and articles that did not focus on inter-organisational issues were removed, leaving 26 relevant articles. The article collection was followed by their categorisation and analysis. Finally, the findings were reported.

Article II, ‘Formation of Voluntary Inter-Organizational IT Governance for Healthcare and Social Welfare IT – Theoretical Background and Empirical Evaluation’, had multiple goals. The aim was to confirm the usability of the RBV theory, TCE theory and Granovetter’s (1973) social network theory in an inter-organisational context and to describe the benefits that are available when using the IT governance principles. The study examines the importance of IT governance principles in the formation of IT governance between healthcare and social welfare organisations. The research started with a theoretical background. While understanding that literature on inter-organisational IT governance is rare, we decided to use the principles of the intra-organisational IT governance and extend these into an inter-organisational context with the constructs from selected other theories. Theories related to IT governance, RBV, TCE and social networks were included. RBV was selected because it focuses on revenue/value increases (Wiengarten et al., 2013). TCE was selected because it focuses on cost reduction (Geyskens et al., 2006) as the reasons and outcomes of governance. Social network theory was selected because it depicts the connections between organisations in networks (Borgatti & Foster, 2003).

In the empirical research, the primary research method was the reflective observation approach method (e.g. Kolb, 1984) in a single case context because one of the researchers was acting as a consultant in the case. The case study guidelines (Yin, 2009) and the constructs for building a research study were followed (Eisenhardt, 1989; Sireci, 1998). The full project material, including meeting memos and presentations, was also accessible and provided a comprehensive description of the implementation of the project. In the project, more than 100 organisations were included in the healthcare and social welfare areas in one of the country’s five Special Catchment areas covering almost 50% of the country. Observations and documents were analysed and documented. The reflective observation approach was supplemented with a web-enabled self-administered survey (Pinsonneault & Kraemer, 1993). The survey was organised to allow subject experts to evaluate the expected benefits, IT governance principles and the roles of organisations involved. The design of the survey and the survey details were based on general guidance (Eisenhardt, 1989; Sireci, 1998). Only a part of the data which focused on IT governance principles and benefits was used in the current study. In the survey, pre-formulated statements were

included, and participants were expected to evaluate statements on a seven-point Likert scale (Allen & Seaman, 2007). Of the 260 invitations that were sent out, 76 responses were received, giving a response rate of 26%. Responses were collected, analysed and documented, and the results from the project work and the survey were collected.

In Article III, 'Volume, Benefits and Factors that Influence Inter-municipal ICT Cooperation in Relation to ICT-related Social Services and Healthcare Services', the purpose of the research was to obtain a broader understanding of the cooperation and to determine how municipalities conduct inter-municipal ICT cooperation. The research process started with a theoretical background. TCE theory (Williamson, 1975) and RBV theory (Wiengarten et al., 2013) were used to describe the benefits available from ICT cooperation. RDT (Pfeffer & Salancik, 1978) and Granovetter's (1973, 1983, 1985, 2005) social network theory were included to clarify the resource, and the social network-related issues affecting ICT cooperation.

For the empirical part, data from a nationwide study and three regional studies were used. The data and results from the nationwide study (Ministry of Finance, 2015) were used as secondary data. The nationwide study consisted of data obtained about ICT usage in 144 municipalities around the country grouped in 20 regional areas. The nationwide study was done by various independent consultants, who were using interviews and other available data to collect understanding about the ICT situation in the respective areas. Based on their understanding, they wrote area-specific reports, which were collected by the Ministry of Finance, which made them public. Owing to the inconsistency of the reports, we were able to use only 17 of the regional area reports. The researchers read and analysed the reports separately, compared the findings and identified the common conclusions.

Data from three regional studies, which consisted of a municipal group from south-western Finland, a municipality and a healthcare organisation group from northern Finland and a municipal group from northern Finland, were also used. In the south-western Finland study, ICT leaders of the group were interviewed by the author of the thesis using a thematic, open-ended, semi-structured questionnaire (Myers & Newman, 2007). Based on the interviews, the researcher wrote a report about his findings.

In the northern Finland studies, data from two case studies (Hyvönen, 2015; Dahlberg, 2016) were used. In the Hyvönen case, it was investigated how ICT services were arranged in the 23 municipalities of one Finnish region by interviewing those responsible for ICT in each municipality. Open-ended questions were used to collect the understanding, how the ICT issues in the municipalities were. Supplemented by relevant municipal data, findings were collected and documented. In the Dahlberg case, observations, documents supplemented by a survey were used as described in Article II. Finally, we collected and documented the findings from all cases.

Article IV, 'How IT Governance Practices Contribute to Inter-Municipal ICT Co-operation and its benefits: Indeed, "The Emperor Has No Clothes"', examined how ICT cooperation between municipalities is carried out and governed in 20 municipal regions in Finland. The research process started with the information collection for the theoretical background. TCE (Coase, 1937; Williamson, 1975, 1985) and RBV (Barney, 1991; Wiengarten et al., 2013) were included as explainers for the ICT co-operation, common IT governance as means to cooperation benefits and social network theory as a predictor of cooperation. For the empirical part, the results from existing studies conducted in central Finland (Hyvönen, 2015), northern Ostrobothnia (Dahlberg, 2016) and the nationwide study (Ministry of Finance, 2015) were used. Reports from the nationwide study were read and analysed separately by the researchers; the findings were compared, and the mutual conclusions identified. A comparison was made between the theoretical benefits and governance practices with those we identified empirically from the municipal regions and prior studies. To conclude the research and to obtain a better understanding of empirical findings, we reviewed Granovetter's (1973) social network theory.

Article V, 'SECOs as a Mean to Survive? – Case Municipal ICT', examined whether the municipal ICT cooperation can be considered a software ecosystem (SECO)? The research process started by reading theories about software ecosystems (Moore, 1993; Manikas & Hansen, 2013). In a SECO, actors constituting a proper ecosystem correspond to the participants, which can be identified in a municipal ICT cooperation. In addition, RBV (Barney, 1991) was viewed for cost and resource optimisation reasons, TCE (Williamson, 1975) for cooperation costs reasons and Granovetter's (1973) social network theory for the importance of connections and trust between groups and people. In the empirical part of the research, we collected information from three municipal groups with joint ICT activities. All municipality groups were located in the southern part of Finland covering six to eight municipalities each. The author of the thesis conducted 10 thematic semi-structured interviews among ICT leaders of the municipal groups to get an understanding about the reasons for the ICT cooperation, about the benefits municipalities have received through the cooperation and about the future visions about the inter-municipal cooperation. In the interviews, the same questionnaire (Appendix) was used. The interviews were transcribed, analysed and documented, and the findings of the ICT issues were documented.

3.3 Author's Role in the Articles

This section clarifies the role of the author of the thesis in each article. The role varies from taking a co-author role to that of the sole author.

Article I was produced solely by the author of this thesis, and for Article II, the author focused on the part of the theoretical background. In Article III, the author of this thesis focused on creating a part of the theoretical background, conducting interviews in the south-western Finland study, collecting and analysing the data for the nationwide study and collecting data from northern Finland's municipal study. The author of this thesis also performed practical work related to the publishing process. In Article IV, the author created a part of the theoretical background, and performed the data collection and analyses of the nationwide study. The author also completed a part of the writing. Article V was produced solely by the author of this thesis.

4 Empirical Studies and Results

This chapter introduces the articles included in the thesis with the findings. The chapter also presents the results and reveals the connections between the articles and the RQs.

4.1 The Articles

The following sections present all five articles included in the thesis. Each article is presented with the research findings. The role of the article for this thesis is also clarified.

4.1.1 Article I

The article 'Inter-Organizational IT Governance Research: A Literature Review' by Helin (2019) clarified the current state of the inter-organisational IT governance research.

The findings of the literature review highlight that the current inter-organisational IT governance research is still quite limited, with only 26 articles identified. According to the literature review, the research of inter-organisational IT governance has been published in nine conference papers and 17 journal articles since the start of this millennium. The journal that has published the most inter-organisational IT governance-related articles is the *European Journal of Information Systems* with three articles. There are 22 different persons mentioned as the first author of an article. Dr Acklesh Prasad is the most active author with two journal articles and one conference paper. Of the reviewed 26 articles, 15 focused on guidance or strengthening current understanding, three articles monitored implementation, four articles suggested improvements or extensions, and five articles focused on a concept, definition or model development. Empirical content was used in 19 articles, and seven articles used a conceptual approach.

The review of existing research revealed that research for inter-organisational IT governance is still lacking compared to research focusing on intra-organisational IT governance research, which creates many research opportunities for the future. Article I provides answers to RQ3 clarifying the current state of the inter-organisational IT governance research and confirming the possibility of using theories that explain intra-organisational IT cooperation in the inter-organisational context.

4.1.2 Article II

The article 'Formation of Voluntary Inter-Organizational IT Governance for Healthcare and Social Welfare IT - Theoretical Background and Empirical Evaluation' by Dahlberg and Helin (2014) examined the formation of IT governance between healthcare and social welfare organisations.

The results of the study indicate the importance of ICT cooperation. Despite the fears of trust in cooperation, the benefits of the ICT cooperation were valued highly. Participants were willing to start using IT governance principles for their ICT cooperation due to the known benefits. However, in some cases, the practical knowledge of IT governance among the participants was not sufficient to convince them about the benefits of ICT cooperation. Support from the theoretical background was needed to receive a complete understanding of the IT governance principles and benefits. The study confirmed the usability of RBV, TCE and the social network theory for increasing the IT governance knowledge in the inter-organisational ICT cooperation context. The results of the survey confirmed the importance and priorities of the IT governance principles and the benefits of ICT cooperation.

The study provides answers to RQ1 by clarifying the reasons for ICT cooperation and to RQ2 by confirming the importance of IT governance principles in creating the IT governance arrangement between organisations. The study also answers RQ3 by confirming the usability of RBV, TCE and Granovetter's (1973) social network theory in the inter-organisational context.

4.1.3 Article III

The article 'Volume, Benefits and Factors that Influence Inter-municipal ICT Cooperation in Relation to ICT-related Social Services and Healthcare Services' by Helin and Dahlberg (2017) examined the ICT cooperation of Finnish municipalities.

The research showed that municipal ICT cooperation and IT governance differ significantly in Finland. There are municipalities which do not cooperate with their nearby municipalities in ICT and other municipalities which cooperate actively and have joint IT governance. According to the results, the municipalities that run their IT through a well-organised ICT cooperation are capable of receiving significant benefits through their cooperation.
The study provides answers to RQ1 by highlighting the reasons and expectations that public organisations (municipalities) have about ICT cooperation, and the benefits the municipalities receive from the ICT cooperation. The study also answers RQ2 by emphasising the importance of well-structured and well-governed ICT cooperation.

4.1.4 Article IV

The article 'How IT Governance Practices Contribute to Inter-Municipal ICT Cooperation and Its benefits: Indeed, "The Emperor Has No Clothes' by Dahlberg and Helin (2017) examines how ICT cooperation between municipalities is carried out and governed in 20 municipal regions in Finland.

In this research, we found that municipal regions have different ways of working in IT. Several municipalities are not currently cooperating in ICT while some municipalities cooperate using various IT governance practices. Municipalities also receive different benefits from their cooperation.

The research showed that analysing secondary data provides a useful option for the research of IT governance and ICT cooperation. The research also shows how empirical studies can be conducted using secondary data as a methodological choice. The article confirms the role and importance of social ties in the establishment of ICT cooperation. Closer examination of Granovetter's (1973) social network theory also confirmed the importance of weak ties to the establishment of cooperation.

The study provides answers to RQ1 by identifying the reasons for ICT cooperation and the benefits that public organisations are looking forward to receiving from ICT cooperation. The study emphasises the importance of well-structured and well-governed ICT cooperation as focused on by RQ2. It extends the current cooperation research from intra-organisational contexts to inter-organisational contexts. By doing so, this research provides arguments for RQ3 by confirming the usability of selected theories for the inter-organisational context.

4.1.5 Article V

The article 'SECOs as a Mean to Survive? – Case Municipal ICT' by Helin (2017) extends the ICT cooperation research and clarifies whether the municipal ICT cooperation can be considered a software ecosystem (SECO). In a SECO, actors constituting a proper ecosystem correspond to the participants that can be identified in a municipal ICT cooperation.

In the research, the theoretical base is built on the RBV theory, TCE theory and Granovetter's (1973) social network theory. This theory base was used with definitions from the software environment. The empirical research was conducted among three municipal ICT cooperation arrangements (ecosystems) in Finland, and the data is based on interviews with leading experts in the ecosystems.

The study confirms the similar structures for municipal ICT cooperation and a SECO. The same actors, such as the hardware (HW) and the software (SW) platforms are in place, and the vendor companies are often the same. However, according to the definition of a SECO, a software provider should form the core of an ecosystem. However, this is not the case in municipal ICT cooperation. In the municipal context, a municipality, which is often a regionally leading municipality or a major city, acts as a leader in an inter-municipal ICT cooperation. Thus, ICT cooperation between municipalities does not fulfil the definition of a SECO (Manikas and Hansen, 2013). In the case of municipal ICT cooperation, a business ecosystem is a correct term to use (Moore, 1993).

The study clarifies the reasons for inter-municipal IT cooperation. The three most mentioned reasons were cost savings, improvements to IT efficiency and IT procurement/outsourcing. The study provides answers to RQ1 and offers further support for RQ2 by clarifying the structures and IT governance models of inter-municipal ICT cooperation and making a distinction between municipal ICT cooperation and SECOs.

4.2 Results

In this thesis, the practical target is to examine ICT cooperation between municipalities, obtain a better understanding of the reasons for cooperation and to establish how municipalities are cooperating and governing the ICT cooperation. The thesis strives to determine whether the theories used in the intra-organisational ICT cooperation could be expanded to inter-organisational ICT cooperation. To fulfil the research objective, three RQs were set. The following paragraphs review all three RQs and discuss the results obtained in the articles.

As the municipalities in Finland vary in terms of the number of residents, industrial structures and locations, and their needs and expectations for inter-municipal ICT cooperation, RQ1 examines why Finnish municipalities cooperate in ICT. Articles II, III, IV and V examined this issue. RQ2 clarifies how inter-municipal ICT cooperation is organised and governed. Articles II, III and V investigate this topic. RQ3 aims to explain ICT activities between organisations using existing theories about the organisation's internal IT governance principles and IT governance benefits. Articles I, II and IV aim to clarify the topic and answer RQ3.

RQ1: *What reasons do the municipalities have to participate in the inter-municipal ICT cooperation?*

Article II examined the formation of inter-organisational IT cooperation and IT governance in a broad public environment consisting of ICT experts from healthcare, social welfare and municipal functions. Even though participants had only a little practical knowledge about IT governance, they valued the ICT cooperation. They were willing to start using IT governance principles for their ICT cooperation due to the possible benefits. The reasons to start ICT cooperation, including the need to pool, share and exchange IT resources.

Article III found that inter-municipal ICT cooperation was usually somewhat or very limited among the studied municipalities. Only three of the 20 regional municipal areas were identified to show noticeable and well-organised ICT cooperation. However, even within the other regional municipality areas, the attitude to ICT cooperation was favourable. While ICT cooperation was limited and restricted often only to joint purchases, the reasons for ICT cooperation were not explicitly specified. Expected benefits from ICT cooperation included economic and non-economic issues in which discussions and experience sharing with colleagues were highly valued.

Article IV revealed inter-municipal ICT cooperation to be very limited but showed that visions for better cooperation exist. Most of the reasons for ICT cooperation relate to cost savings and increased value creation. The main reason to improve ICT cooperation was seen as a means for cost savings. Otherwise, ICT cooperation was considered useless, and 7 out of 17 municipalities were planning to develop their ICT services alone. To receive potential benefits from ICT cooperation, input from the municipality’s civil servants is needed. However, civil servants were often too busy, or they had no interest to provide input. They may even be missing the required competencies to contribute. Especially when civil servants believe that they receive no benefit from ICT services in their work; thus, they do not promote the inter-municipal ICT cooperation.

Article V found that all studied municipal groups had similar reasons for ICT cooperation. The most important economic reasons for cooperation were potential cost savings and resource optimisation while the most important non-economic reasons were communication between the ICT colleagues and the development of ICT skills and knowledge.

In summary, organisations were optimistic about the benefits available through ICT cooperation. The benefits, which are strongly expected, are non-economic and mainly related to personal communication, i.e. communication with ICT colleagues, new ICT skills and knowledge development but also resource optimisation is expected. In addition, ideas and willingness for ICT cooperation exist. Most of the economic reasons for potential ICT cooperation were related to cost savings and increased value creation. These are the reasons answering to RQ1.

RQ2: *How is the inter-municipal ICT cooperation governed?*

Article II examined the formation of inter-organisational ICT cooperation among public organisations. The proposed and implemented IT governance arrangement was based on two different governance bodies: steering operational IT governance work and an IT governance council. The essential services for organisations were identified and divided into three groups: (1) jointly governed and locally managed, (2) locally governed and managed and (3) TBD (to be decided). Accountabilities of the critical services/processes were determined. The study confirmed the importance of other constructs in addition to the IT governance body that is needed when establishing inter-organisational IT governance.

Article III identified inter-municipal ICT cooperation as still quite rare and restricted, often covering only joint ICT-related purchases. However, attitudes toward more extensive ICT cooperation are favourable. In the study, we identified only three of 17 regional areas which had well-organised ICT cooperation in place. In one regional municipal area, municipalities shared the ICT managerial function, and in another regional municipal area, they had a jointly owned ICT service company. In the third regional municipal area, municipalities had joint inter-organisational ICT governance, where they divided the ICT services into national, regional and municipal level activities and acted accordingly. All three regional municipal areas which had a well-organised ICT cooperation perceived significant benefits compared to the areas where the ICT cooperation was limited. In the areas where the ICT cooperation was limited, ICT experts were hoping for more active cooperation.

Article V examined the inter-municipal ICT cooperation between three municipality groups' organisations and IT governance structures. In principle, the municipality groups were similar based on the number of municipals in each group and the

number of inhabitants in the municipalities. However, the ICT cooperation was organised differently in each group. In one municipality group, ICT cooperation was voluntary without any official commitments. In the second group, the participating municipalities decided on the extent of their commitments, and the ICT cooperation was fulfilling the decisions. In the third municipality group, all participating municipalities were fully involved in ICT cooperation. Despite different targets of the ICT cooperation and different governance structures among the three groups, all municipality groups were satisfied with the cooperation and their joint achievements.

In summary, inter-municipal ICT cooperation has been implemented very differently in Finland. Based on the studies included in the thesis, some municipalities do not cooperate with ICT-related issues with their nearby municipalities, and other municipalities have well-established ICT cooperation. In addition, many municipalities conduct some form of ICT cooperation without any explicit reasons or targets. However, it can be seen that the municipalities that belong to a well-established, well-governed ICT cooperation receive benefits that the municipalities which do not participate fail to receive. Most of the municipalities have realised the benefits and thus favour the idea of starting ICT cooperation or joining an established ICT cooperation group. Thus, RQ2 has been answered.

RQ3: *What are the possibilities to explain IT activities between organisations using existing theories about an organization's internal IT governance principles and IT governance benefits?*

Article I identified the current state of the inter-organisational IT governance research. The study revealed that research for inter-organisational IT governance is still relatively limited, with only 26 articles published since 2000. However, the research confirmed that voluntary inter-organisational IT governance provides considerable benefits through ICT cooperation, where different competences are needed for successful cooperation. IT governance can use different organisational models, e.g. a federal governance structure. IT resources and management processes create synergies in inter-organisational cooperation. Organisations should sustain their IT capabilities, while management for IT resources may be a challenge in cooperation. The study revealed that theories (RBV, TCE and social network theory) used to describe IT cooperation in the intra-organisational context can be used in the inter-organisational IT governance context.

In Article II, the currently used constructs of the RBV, the TCE and Granovetter's (1973) social network theory provided support for understanding the interdisciplinary nature and theoretical background of the IT governance principles and benefits. This confirms that RBV, TCE and social network theory can enhance IT governance knowledge. The abovementioned theories also offer valid constructs to enhance IT

governance knowledge, and they represent the IT governance principles and benefits of ICT cooperation. The IT governance principles and benefits, which were planned using the enhanced IT governance knowledge, were important when creating the voluntary inter-organisational IT governance arrangement. This is important because current IT governance research has focused on investigating single organisation IT governance. The RBV and the TCE focus in a broader environment, which includes single organisations, markets and networks/alliances. RBV and TCE are also widely used in the IT outsourcing research, which makes the connection to the IT governance research promising.

Article IV found that inter-municipal ICT cooperation and the usage of IT governance practices were limited. In the municipality groups, where joint IT governance arrangements were agreed, the RBV and the TCE propositions were followed. The IT governance arrangements were the same in the intra-organisational as in the inter-organisational contexts. They followed the propositions of the IT governance practice research, using the same elements, namely structure, process, and relational mechanism practices. As the relational mechanism was the most used IT governance practice, this practice is proposed as the starting point when building ICT cooperation and IT governance between municipalities. As discussed in Granovetter's (1973) social network theory, the elements of trust and social ties are needed for ICT cooperation and IT governance. It was noted that effective IT governance created the trust and social ties between municipalities. Because of ICT cooperation between municipalities, economic and non-economic benefits were available; joint purchases and resource sharing were the most common benefits received. It became evident in the research that the usefulness of weak ties between municipality ICT experts was worsening due to intra-municipal strong ties. This finding highlighted the importance of intra-municipal issues, leaving the inter-municipal issues with lower importance and thus weakening the IT cooperation. The social network theory proved to be particularly useful in explaining the issues which affect the success of inter-municipal ICT cooperation.

Our research confirmed the ability to use theories for intra-organisational IT governance in the inter-organisational context. The same IT governance arrangements, structure, process and relational mechanism practices used in intra-organisational IT governance were also implemented in inter-organisational arrangements as proposed by the IT governance practice research. Trust and social ties are needed for inter-municipal ICT cooperation and IT governance, as described by Granovetter's (1973) social network theory. Our research also confirmed that more benefits are available to municipalities involved in ICT cooperation compared with municipalities which are not cooperating. RQ3 has, therefore, been answered.

The findings from the articles show the overall status for municipal ICT cooperation in Finland with the reasons the municipalities have for cooperation and the

forms of IT governance that the municipalities have selected to use. The usefulness of current theories used in intra-organisational ICT cooperation was shown to be relevant in an inter-organisational context. Based on the research conducted and the articles included in the thesis, it can be said that the objective of the thesis has been fulfilled.

5 Implications and Conclusions

In this chapter, I discuss the implications of the thesis and the theoretical and practical contributions of the thesis. To conclude, I present a summary of the thesis and thoughts and suggestions for future research.

5.1 Implications

According to the research conducted, ICT is still often seen as a function that needs little attention and few resources. Many Finnish municipalities execute ICT independently with few resources, and they fail to see any added value in ICT cooperation. However, the municipalities which have understood the importance of ICT in general and in joint ICT in particular, are participating in well-governed ICT cooperation systematically with their nearby municipalities and they are receiving the benefits. Although the structure of well-governed ICT cooperation likely differs, municipalities should aim to be fully involved in ICT cooperation instead of working in isolation. However, the reasons for and benefits from inter-municipal ICT cooperation vary according to the prevailing economic and political situation.

Additionally, depending on the decisions by the national government, the reasons and benefits for the inter-municipal cooperation may change overnight. Further, economic realities should drive municipalities towards closer ICT cooperation. Also, as predicted by Gil-Garcia (Gil-Garcia, 2012), ICT cooperation between government organizations and local government is intensifying and is still in demand.

In our research, the importance of social relationships has been highlighted, strengthening the role of trust in inter-organizational cooperation as also discussed earlier (Pardo, Gil-Garcia & Burke, 2006). Based on our findings, the models of municipal ICT cooperation vary a lot in Finland. The Finnish models of inter-municipal ICT cooperation are closer to the Swedish model (Juell-Skielse et al., 2017) than the Italian model (Ferro & Sorrentino, 2010) because Finnish municipalities are generally looking for some benefits through the ICT cooperation. Municipalities in Finland are using the cooperation modes of the Convention, the Framework agreement and the Consortium. Unlike in Sweden, the Limited company model is also

used in Finland (e.g. the model of cooperation in North Karelia). The New public body form of collaboration was not identified in Finland.

Overall, it can be said that in Finland, inter-municipal ICT cooperation occurs in many different ways. There are municipalities, which try to get some benefits like improved efficiency or shared services through ICT cooperation, and there are municipalities, which are doing ICT cooperation to save money through a joint procurement. Also, there are municipalities, which have made a legal agreement about ICT cooperation with roles and responsibilities, and there are municipalities, which have established a joint company to take care of their ICT issues.

For scientific research, our research contributes to the still limited research on inter-municipal ICT cooperation by studying the current state of Finnish inter-municipal cooperation. The possibility of using different models of ICT cooperation in various cases of municipal cooperation gives freedom to municipal decision-makers and does not limit their choice. It is up to decision-makers to choose the guiding factors, the purpose of the collaboration and the desired benefits.

By highlighting the necessity and importance of social networks, our research emphasizes the importance of personal relationships in operation and development of municipal ICT functions. By validating the usability of existing intra-organizational theories in an inter-organizational environment, our research extends the potential of current theories in future research.

5.2 Theoretical Contribution

In Article I, we conducted a literature review about the current state of inter-organisational IT governance research. Based on the review, we identified a research gap where intra-organisational IT governance was dominating research, and inter-organisational IT governance was mostly absent. The RBV, the TCE, and social network theories have been widely used in the governance arrangement research, and they provide several elements for measuring cost savings and value increases. These theories have also promoted performance benefits. Based on our research, measurable benefits are also available through inter-organisational cooperation, if IT governance arrangements are systematic and well organised. Organisations can implement the same research-proposed components used in intra-organisational arrangements such as the structure, process and relational mechanism practices in the inter-organisational arrangements. Also, these theories highlight the benefits of inter-organisational cooperation and describe IT governance principles. The role of trust and social ties are vital for cooperation between municipalities as well for the joint IT governance as discovered in our

research. These findings underline the importance of Granovetter's (1973) social network theory in inter-organisational cooperation.

Our research confirms that organisations can use RBV, TCE, and the social network theory to extend IT governance research from current intra-organisational research to a more topical inter-organisational context providing a theoretical contribution. The role of RBV and TCE focuses more on cost savings and value increases, meaning that organisations do not have enough resources (money or people) to do everything by themselves, and they have to cooperate. According to our research, the role of the social network theory is crucial in making cooperation work efficiently and productively. This finding adds a new angle to the theoretical approach.

5.3 Practical Contributions

Our research makes several practical contributions. Based on our research, the importance of social connections cannot be underestimated. Municipal IT cooperation often starts with informal meetings where work colleagues from different municipalities discuss professional issues. Informal meetings may progress to a more systematic and well-governed cooperation that may ultimately have real measurable benefits. This outcome is why practitioners are encouraged to focus on the social connections of inter-organisational IT governance. The role of social connections and trust is vital in the formation of IT governance between organisations. Because the role of social connections and trust is so essential, it would make sense to encourage and allow people from different organisations to organise official or unofficial events or the like to meet new people, get to know them better and build trust to them. Especially in the municipal sector in Finland, where the employment relationships tend to be long, this would make all forms of cooperation much more accessible. With the help of new contacts, municipal civil servants can learn new things and discuss their challenges even without closer cooperation.

Also, practitioners should identify real cost savings and value increase possibilities, not forgetting the importance of sufficient resources for implementation. They should also take into consideration IT governance principles and IT cooperation benefits when they are planning new IT governance arrangements. When joint decisions form the basis for the IT cooperation between organisations, when there is sufficient amount of resources (both money and human) available and when the IT governance is well established, the participants will be satisfied. Organisations can expect better ICT services and other measurable benefits. However, even though inter-municipal cooperation is welcomed, official involvement in forms of various incentives should be planned carefully, while the benefits may be uncertain (Sorrentino and Simonetta,

2013). As such, inter-organisational cooperation can be a solution for many municipal challenges. However, despite its promise, inter-organizational cooperation as such is not a guarantee of success (Ferro and Sorrentino, 2010).

5.4 Limitations

Even though the current thesis has attempted to obtain a broad understanding of the status of inter-municipal ICT cooperation, there are some limitations. We conducted all the research included in the thesis in one country and during a relatively short period. The fact that economic and political realities are varying may change the reasons and benefits available from ICT cooperation even in Finland. Future research conducted in another country could bring different results due to cultural, economic, political or other reasons.

A limitation is that we were not able to identify much research regarding the inter-municipal ICT cooperation focus. A reason for this may be the fact that different countries use different vocabulary when they are discussing ICT issues of their local government. Targeting to other research areas and using different search criteria, other research concerning inter-municipal ICT cooperation may exist.

A limited number of public organisations, mainly municipalities but also healthcare and social welfare units which have been at the core of our research, may cause some biases due to geographic, financial or structural reasons. Also, the limited number of interviews and the selection of ICT experts who participated in the interviews may affect the generalisability of the results.

The results concerning ICT cooperation and the IT governance benefits of ICT cooperation are clear and consistent. Still, the number of municipalities which were found to have well-organised inter-municipal ICT cooperation and joint IT governance is limited. This small number may limit the comparison of the achievements of ICT cooperation for different municipality groups, i.e. one with organised IT governance vs another with non-organised IT governance.

The main theoretical limitation is that the theoretical basis used throughout the thesis is rather narrow. Only a few fundamental theories have been used throughout the research. Other theories and frameworks, such as a knowledge-based theory of inter-firm collaboration (Grant and Baden-Fuller, 1995) and a dynamic capabilities framework (Teece et al., 1997), exist. These theories also focus on cooperation between organisations, and the benefits of such collaboration. Extending the theoretical basis for these theories may bring new observations and conclusions.

5.5 Future Research

Our research provides a sound basis for future IT governance and ICT cooperation research where RBV, TCE and social network theories enable a robust and widely used basis. Researchers use RBV to explain the limited amount of resources in an organisation, and they use TCE to explain the distribution of tasks and challenges among the participants. In our research, we brought the importance of social network theory into the research of inter-organisational cooperation. Future research needs to evaluate the impact of social ties while implementing IT governance.

While research for inter-organisational ICT cooperation at the municipal or local government level is still relatively rare, more studies will be needed. Inter-municipal ICT cooperation research in a few countries (e.g. Italy, Nordic countries, USA) has established a sound foundation and research should be continued. It would be interesting to compare the effectiveness of municipal cooperation and the mode of operations in different countries and share best practises. Since cooperation models vary a lot of Finland, it would be interesting to propose a similar approach to other countries. At the same, it could be useful for Finnish municipalities to better understand the cooperation models, which, e.g. Sweden or Norway, are using and further develop the Finnish approach. Cooperation between countries is welcome.

However, even a repetition of the current research conducted in the country of the current research (Finland) would be of significant value due to the new political situation. Because it usually takes time to build trust and create ICT cooperation and joint IT governance between organisations, longitudinal studies would offer an excellent research ground. While existing research has found significant advantages to inter-organisational ICT cooperation, future research could examine the concrete benefits received from ICT by planning the benefits in the ICT project planning and including a follow-up of the benefits at different phases of the project. Doing so would raise the understanding of the importance of ICT and could eliminate the lack of resources.

While IT governance research has focused mainly on single organisation governance and ignored inter-organisational cooperation, our research provides a good opening for future inter-organisational and market governance research. An example of market governance research is IT outsourcing research. Here, as RBV and TCE are also widely used, the connection to IT governance research exists. Another future research area could be supplier-customer networks and IT governance arrangements in those networks. Also, networks with a principal contractor and several subcontractors would be worth researching. In general, due to the current network-based business environment, organisations need increased IT governance and ICT cooperation research in a networked business environment.

In our research, we also observed that no municipality cooperation exists in the areas of data security and IT risk management, which invites conducting research on ICT cooperation and IT governance in these areas. The area of inter-organisational IT governance in health information governance also invites more research.

5.6 Conclusions

The thesis has provided an exciting journey into the ICT environment of public organisations, especially in the ICT environment of municipalities in Finland. It has been fruitful to notice that the role and appreciation of ICT are changing. More and more municipalities have realised the importance of ICT. For them, ICT is not just a necessary tool for emailing and bookkeeping, but it is a way of improving the living environment for their residents. They have also realised that for effective ICT operations, they need inter-organisational cooperation between municipalities. However, there is an issue which may cause municipalities to avoid inter-organisational ICT cooperation: the fear of a hostile municipal takeover. Small municipalities are afraid of a situation in which their more prominent municipal neighbour may grow its influence and eventually force its smaller neighbours to unite. However, in the cases of the current thesis, there were no signs or comments about this type of hidden agenda.

In Finland, the previous government's decision regarding a plan for a change in nationwide administration structures combined with a change in social welfare and healthcare structures increased attention toward the ICT issues. The government has changed, and the political intent is different. The planned change of the previous government will not take place. Still, authorities have noted the importance of municipal ICT-related issues and the development for public ICT is progressing within Finland. Some municipalities, especially the smaller ones, would like to have national guidelines regarding how local ICT should be developed, implemented and managed. However, such practical guidelines do not yet exist, and municipalities have to develop and implement their ICT alone. Due to limited resources, municipal ICT development activities often shine out of absence, and municipalities focus all efforts on daily ICT operations, alongside one's work. Municipal decision-makers should have a better understanding of the possibilities and about the potential ICT has to create better and more effective services for residents of municipalities. They should also have better visions about ICT as an enabler for the differentiation of municipalities.

There have been some comments about the structure, where one could divide public sector ICT activities into three levels: nationwide, region-wide and local level. Although it would make sense to do some ICT tasks at the local level, it would be

better to do some issues jointly on a regional level or with nearby municipalities. Local authorities could handle small, daily ICT operations and municipal specific matters at the local level. In contrast, authorities at a regional level could handle issues which have an effect on all municipalities in a region. Authorities at the national level could take care of generic applications and guidelines and provide general support for all municipalities. Further, municipalities and other public organisations should direct more focus on the networked business environment. Otherwise, all ICT operations will stay on normal daily mode, and no progress will take place.

Overall, municipal ICT will need more resources to ensure good results, prompt service development and digitalisation of services. The role and importance of inter-organisational ICT cooperation among municipalities will grow. Thus, essential issues are how to organise ICT cooperation between municipalities, how to manage the governance of ICT cooperation permanently and how to organise cooperation between the municipal, regional and national levels. According to our research, there is not just a single solution for every situation. Various ways of how to organise ICT cooperation can be implemented, which may provide satisfactory results. However, municipalities with well-established ICT cooperation can expect to receive measurable benefits through their collaboration. ICT cooperation improves the efficiency of organisations, although the reasons for cooperation and the details of the benefits may change due to political or other reasons. In any case, municipalities with poor ICT operations, inadequate online services and weak digitalisation capabilities will not survive in the future.

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Appendix

Interview guidelines/questions/discussion themes in English

This guideline is a translated version of the guidelines for the interviewer. The target for the guidelines is to highlight the topics, which should be discussed during the interview. The guidelines are NOT meant to be followed meticulously but rather to provide discussion topics on a general level.

A. Background to ICT cooperation

1. Why do you cooperate in the field of ICT with other municipalities?

2. Was this the original reason for ICT cooperation (if not, please specify)?

3. Who initially decided to launch ICT cooperation?

4. What were your initial expectations for ICT cooperation?

5. Which is the essential criterion for ICT cooperation: cost savings, or more efficient organization of work (choose another and justify)?

B. Practice of cooperation

1. What does ICT cooperation entail in practice?

2. How is ICT cooperation organized?

3. How is the success of ICT cooperation evaluated?

4. Do you follow the COBIT model for IT governance, cooperation and ICT outsourcing?

C. Impact of ICT cooperation

1. Who benefits from ICT cooperation?
   i Within the municipality?
   ii. Other (external) actor?

2. What are the costs of ICT cooperation (direct and indirect costs)?

3. What are the benefits of ICT cooperation?
   i In terms of costs?
   ii. In terms of work organization (short and long term)?

4. How has ICT cooperation worked so far, and what have been its real consequences?

5. Have there been any problems with ICT cooperation (if so, how have they been addressed)?

D. The future of ICT cooperation

1. What do you expect from ICT cooperation in the future (within 1-3 and 4-5 years)?

2. How should ICT cooperation be improved in practice?

3. How could the IT governance structure be developed?

E. Other comments

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