Annastiina Norppa

THE ROLE OF NETWORK COORDINATION IN BUSINESS INCUBATION - COMPARATIVE EVIDENCE FROM FINLAND AND RUSSIA

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ABSTRACT

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Business incubators (BIs) have an important role in promoting entrepreneurship and innovation. Networks have been identified as one of the main factors influencing business incubation success; however, their management has not been widely covered in previous business incubation research. Therefore, the main objective of this research is to investigate the role of network coordination in business incubation. Thus, the research aims to understand how the BI as a hub firm coordinates, i.e. manages and orchestrates, the business incubation process. As business incubation is also claimed to be affected by country specific factors, a cross-country comparison of Finland and Russia is conducted. Based on previous scientific literature on networks, network management, network orchestration and business incubation, a theoretical model combining business incubation and network coordination is developed. Through a qualitative multiple-case study evidence from a cross-country sample of BI managers and their residents was collected via semi-structured interviews. Based on the empirical data the network coordination mechanisms used by BIs are identified, yet only minor differences in network coordination in different countries are found. The results suggest that network coordination enables value creation in business incubation.
АННОТАЦИЯ

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Тема: Роль сетевой координации в бизнес-инкубации - Сравнительный анализ Финляндии и России
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Бизнес-инкубаторы (БИ) играют важную роль в продвижении предпринимательства и инноваций. Одним из самых главных факторов, влияющих на успех бизнес-инкубации, были признаны сети, но несмотря на это, управление ими не было широко освещено в предыдущем исследовании этой темы. Поэтому основной целью данного исследования является изучение роли координации сети в бизнес-инкубации. Таким образом, исследование направлено на понимание того, как БИ, в качестве заведующей компанией, координирует, то есть управляет и оркеструет, процесс бизнес-инкубации. Так как утверждается, что факторы, характерные для страны, влияют на бизнес-инкубацию, проведён сравнительный анализ Финляндии и России. На основе научной литературы о сетях, управлении сетью, оркестровке сетей и бизнес-инкубации, была разработана теоретическая модель, которая объединяет бизнес-инкубации и управление сетью. Доказательства были собраны посредством качественного анализа конкретных практических примеров обеих стран - интервью с менеджерами и резидентами БИ. На основе эмпирических данных были определены механизмы координации сети, используемые БИ, а также было установлено, что различия в координации сети в разных странах незначительны. Полученные результаты свидетельствуют о том, что координация сети способствует созданию ценности в бизнес-инкубации.
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Lappeenranta 23.5.2014

Annastiina Norppa
# Table of Contents

1 INTRODUCTION ........................................................................................................... 1
   1.1 Background of the study ......................................................................................... 1
   1.2 Research problem & objectives ............................................................................. 5
   1.3 Research design & methodology .......................................................................... 7
   1.4 Structure of the thesis ............................................................................................ 10

2 NETWORK COORDINATION – THEORETICAL UNDERPINNINGS .......................... 11
   2.1 Defining a network ................................................................................................ 12
      2.1.1 Levels of analysis ............................................................................................ 14
      2.1.2 Classification .................................................................................................. 15
   2.2 Network management .............................................................................................. 17
   2.3 Network orchestration ............................................................................................. 20
      2.3.1 Knowledge mobility ....................................................................................... 22
      2.3.2 Innovation appropriability .............................................................................. 22
      2.3.3 Network stability ............................................................................................ 23
   2.4 Network organizations ........................................................................................... 24

3 BUSINESS INCUBATION – THEORETICAL UNDERPINNINGS ............................... 25
   3.1 Preconditions for business incubation development ............................................. 25
      3.1.1 National innovation systems ......................................................................... 25
      3.1.2 Regional innovation systems & clusters ......................................................... 27
   3.2 Incubator definitions ............................................................................................... 28
   3.3 Incubator types ....................................................................................................... 32
   3.4 Business incubation – a process view ..................................................................... 33
   3.5 Theoretical approaches explaining business incubation ....................................... 35
      3.5.1 Network theory ............................................................................................... 35
      3.5.2 Social capital theory ....................................................................................... 39

4 NETWORK COORDINATION IN BUSINESS INCUBATION – THEORETICAL MODEL 42

5 EMPIRICAL RESEARCH METHODOLOGY ................................................................. 45
   5.1 Data collection .......................................................................................................... 45
   5.2 Data analysis ............................................................................................................. 47
   5.3 Reliability & validity ............................................................................................... 49

6 CASE ENVIRONMENTS & STUDIES ........................................................................ 51
   6.1 Finnish innovation system ...................................................................................... 51
      6.1.1 Joensuu Science Park Business Incubator ...................................................... 54
      6.1.2 Spinno Enterprise Center .................................................................................. 55
6.2 Russian innovation system.................................................................................. 56
   6.2.1 Business Incubator Ingria.............................................................................. 59
   6.2.2 Business incubator Polytechnic..................................................................... 60
7 ANALYSES & RESULTS.......................................................................................... 61
   7.1 Business incubator network design................................................................. 61
   7.2 Network coordination mechanisms in business incubation................................. 62
       7.2.1 Management mechanisms.......................................................................... 62
       7.2.2 Orchestration mechanisms.......................................................................... 68
   7.3 Comparison of Finnish and Russian business incubators’ network coordination................................................................. 76
       Cross-country comparison of network management............................................... 76
       Cross-country comparison of network orchestration............................................. 77
   7.4 Revised framework for network coordination in business incubation................. 80
8 CONCLUSIONS, LIMITATIONS & FUTURE RESEARCH......................................... 82
   8.1 Discussion and conclusions................................................................................ 82
   8.2 Theoretical implications.................................................................................... 85
       Network coordination.......................................................................................... 85
       Business incubation........................................................................................... 86
   8.3 Managerial implications..................................................................................... 88
   8.4 Limitations & suggestions for future research.................................................... 90
REFERENCES........................................................................................................... 92

APPENDICES

Appendix 1 Interview cover letter
Appendix 2 Semi-structured interview guide / Incubator representative
Appendix 3 Semi-structured interview guide / Incubatee representative
LIST OF FIGURES

Figure 1 Framework of the research .................................................................5
Figure 2 Research design ..............................................................................8
Figure 3 Structure of the study ...................................................................10
Figure 4 Business network classification framework (adapted from (Möller & Rajala, 2007) ) ...........................................................................15
Figure 5 A framework for orchestration in innovation networks (Dhanaraj & Parkhe, 2006) .................................................................21
Figure 6 Incubator-incubation concept map (Hackett & Dilts, 2004) ..........28
Figure 7 A simplified model of the business incubation process ..............35
Figure 8 Framework for network coordination in business incubation ....44
Figure 9 Joensuu Science Park business incubation process .................55
Figure 10 Spinno business incubation process ........................................56
Figure 11 Revised framework for network coordination in business incubation .....................................................................................81

LIST OF TABLES

Table 1 Research questions ........................................................................6
Table 2 Management mechanisms (adapted from Möller & Rajala, 2007) ...19
Table 3 Incubator value offering (adapted from Hackett & Dilts, 2004) ....31
Table 4 Typology of business incubators (adapted from Aernoudt, 2004) ....33
Table 5 Advantages of networked Incubators (Hansen, et al., 2000) .........36
Table 6 The three dimension of social capital (Nahapiet & Ghoshal, 1998) .39
Table 7 Respondent information .................................................................47
Table 8 Cross-country comparison of network coordination mechanisms in business incubation ..........................................................79
**LIST OF ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>BI</td>
<td>Business Incubator</td>
</tr>
<tr>
<td>BERD</td>
<td>Business Enterprise Expenditure on R&amp;D</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GERD</td>
<td>Gross domestic expenditure on R&amp;D</td>
</tr>
<tr>
<td>MEC</td>
<td>Ministry of Education and Culture</td>
</tr>
<tr>
<td>MEE</td>
<td>Ministry of Employment and Economy</td>
</tr>
<tr>
<td>NBIA</td>
<td>National Business Incubation Association</td>
</tr>
<tr>
<td>NIS</td>
<td>National Innovation System</td>
</tr>
<tr>
<td>NTVB</td>
<td>New Technology-Based ventures</td>
</tr>
<tr>
<td>RIS</td>
<td>Regional Innovation System</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium-sized Enterprises</td>
</tr>
<tr>
<td>STI</td>
<td>Science, Technology and Industry</td>
</tr>
<tr>
<td>VC</td>
<td>Venture Capitalists</td>
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1 INTRODUCTION

This Master’s Thesis study “The role of network coordination in business incubation - Comparative evidence from Finland and Russia” is dedicated, in particular, to the analysis of network coordination in business incubation. In the following chapter the research is thoroughly introduced. First, the general background of the study and the problems are explained, then, the actual research questions are stated, research design and applied methodology are described and further paper structure is presented.

1.1 Background of the study

The important role of new ventures in countries’ economic development is widely recognized by researchers, expert as well as policy makers. Start-ups do not only have a remarkably high contribution to the creation of new jobs (Fritsch, 1997; Fölster, 2000; Shaffer, 2006), but also act as powerful generators for innovations (van Praag & Versloot, 2007). Moreover, innovation is seen crucial in driving economic growth and prosperity. However, the innovation process today is radically different from what it used to be in the previous century. In fact, one of the main differences is the new or renewed importance of new and small companies. Entrepreneurship has replaced the former science and large company R&D as the foundation of innovation. (OECD, 2010) Therefore, encouraging and supporting the establishment and growth of small innovative companies is important.

Business incubators (BIs) are strong instruments in promoting innovation an entrepreneurship (Aerts, et al., 2007). They “nurture young firms, helping them to survive and grow during the start-up period when they are most vulnerable” (Aernoudt, 2004). Thus, incubators are organizations dedicated to the support of emerging ventures. Most research assumes that BIs are economic development tools for job creation as they are believed to result in more successful start-ups (Hackett & Dilts, 2004). Although significant evidence against the effectiveness of business incubation has been found by
researches (Tavoletti, 2013), the National Business Incubation Association (NBIA) (2014), the world's leading organization of BIs based in the USA, suggests, that incubator graduates have the potential to create jobs, revitalize cities and regions, commercialize new technologies, and strengthen local and national economies. Thus, incubation is a growingly popular phenomenon.

The starting point of the history of the business incubation phenomenon dates back to the 1950s. Aerts et al. (2007) have identified three generations of incubators. The first generation emphasized job creation and real estate appreciation, the second included the intangible services and resources as well, whereas, today's third generation has a stronger focus on promising start-ups in the high-tech and ICT sectors. Moreover, the emphasis has moved from the provision of core business services and the design of the incubator, to the provision of a wide and rich network (Hansen, et al., 2000). In fact, research in the field of business incubation is not a new phenomenon either. Regardless of the long history of business incubation research starting from the 1980s, theoretical knowledge of the phenomenon still remains limited and scattered around different research areas (Tavoletti, 2013; Hackett & Dilts, 2004).

Thus, Tavoletti (2013) points out that there is not only a great need of theory, criteria and guidelines about the preconditions for establishing BIs, but also on how they should be managed. Thus to develop BIs, and thereby contribute to the birth of more firms, commercialization of innovations and creation of innovative regions, they need to be understood and managed (Aaboen, 2009). Whereas, Grimaldi & Grandi (2005) emphasize that the evolution of incubators has led to the shift of attention to more intangible and high-value services, such as knowledge and networking. Other research also suggests that networking and network access are one of the most important factors influencing business incubation success (Lichtenstein, 1992; Hansen, et al., 2000; Aernoudt, 2004; Rice, 2002).
In today’s world of rapidly globalizing networks, network coordination and management are emerging as important research topics (Dhanaraj & Parkhe, 2006; Möller & Rajala, 2007; Ritala, et al., 2012; Ritter, et al., 2004; Heikkinen & Tähtinen, 2006). The organizational ability to form and manage relationships with other firms successfully is seen as a source of competitive advantage. The challenge for today’s managers is to develop a networking ability. (Ritter, et al., 2004) Moreover, the role of collaboration in a network is becoming more and more important in the innovation process (Heikkinen & Tähtinen, 2006). In fact, local business linkages and networks are critical to new and small firm innovation. And, as globalization has created the opportunity to connect to global knowledge flows, global networks are becoming increasingly important as well. (OECD, 2010)

Dyer & Nobeoka (2000) suggest that a network can be superior to a firm as an organizational form if it can create a strong identity and coordination rules. Network coordination is seen as the combination of network management, “coordination by commanding” and network orchestration “coordination by enabling” (Ritala, et al., 2012). Network management refers to a more traditional view of management including having a leader in the network, setting goals and timetables, monitoring, and creating organized structures for coordinated collaboration (Möller & Rajala, 2007; Ritala, et al., 2012). Whereas, Dhanaraj & Parkhe (2006) suggest that the leader organizations, i.e. hub firms, can orchestrate their network to ensure the creation and capture of value, without the benefit of traditional hierarchical management. Thus, network orchestration refers to enabling and facilitating the coordination of the network by subtly influencing other actors and creating the premises knowledge exchange, value creation and capture, and innovation (Dhanaraj & Parkhe, 2006; Ritala, et al., 2009; Ritala, et al., 2012). However, researchers have identified that that existing literature does not explain in which situations different forms of coordination would function best (Ritala, et al., 2012; Marques, et al., 2011). Furthermore, a lack of research on how hub companies create and extract value from their networks exists (Dhanaraj & Parkhe, 2006; Nambisan & Sawhney, 2011). Thus, business
incubators offer an interesting environment for understanding the processes through which hub companies perform their coordination functions in network operations.

Moreover, previous research suggests that business incubation is moderated by the state of the economy (Hackett & Dilts, 2004a), country specific institutional factors, such as government policy, investment decisions, as well as by the relevant innovation systems (Freeman, 1987; Lundvall, 2007). Yet, a lack of cross-country studies on business incubation exists (Deak & Podmetina, 2013). Therefore, this study addresses that gap by studying incubation processes in countries with diverging innovation environments: Finland and Russia. The Finnish economy is innovation-driven, whereas, the Russian economy is in transition from an efficiency-driven towards an innovation-driven economy (World Economic Forum, 2013). The neighboring countries’ innovation policies both aim for higher innovation output. In Finland an overall policy shift towards SMEs is taking place, while in Russia, significant attention is directed to improving the conditions for innovation (OECD, 2012),

In the Global Competitiveness Report 2013-2014 (World Economic Forum, 2013) Finland ranks third (out of 148) and Russia ranks 64th in in the overall index. Finland’s position in the results has not changed since previous year; however, Russia improved its ranking by three positions. Moreover, it is recognized that Finland has become a highly innovative economy and thereby occupies the first position in terms of innovation, whereas, Russia shows a lack of innovative capacity, and is placed on the 78th position. Furthermore, Finland ranked 6th and Russia ranked 62nd (out of 142) in the Global Innovation Index (GII) 2013 (Cornell University, et al., 2013), which is the leading reference for benchmarking the innovation performance of countries. The study suggests that one way for governments to enhance their ability to create successful innovation hubs is to provide financial capital to support the commercialization of innovations by establishing and funding start-up technology incubators.
1.2 Research problem & objectives

Research suggests that organized networks and network access are one of the most important factors influencing business incubation success (Hansen, et al., 2000; Lichtenstein, 1992; Aernoudt, 2004; Rice, 2002). Yet, there have been fewer studies which are able to explain how these networks are coordinated – managed and orchestrated. Although network coordination has been studied recently in different contexts (e.g. Dhanaraj & Parkhe, 2006; Marques, et al., 2011; Ritala, et al., 2012) its role in the business incubation settings is still unfamiliar. Therefore it is sensible to analyse the network coordination phenomenon in more detail in this unexplored context.

Figure 1 Framework of the research

The main research objective of this study is to investigate the role of network coordination in the business incubation process. The conceptual framework of the research is presented in Figure 1. Thus, the research aims to understand how the business incubator orchestrates and manages the business incubation process in its different stages. Therefore, the business incubation process calls for investigation as well. Furthermore, the value created for the incubatees through the coordination will be researched, as well as obstacles hindering the value creation possibilities. In addition, to gain
deeper insights on the phenomenon, it is studied in comparative settings of both emerging and developed markets. A cross-country comparison of Finnish and Russian business incubators may lead to suggestions for development both ways.

The main research question and sub-questions deriving from the central problem are presented in Table 1. These questions are addressed in the remainder of this paper by drawing on the prior literature, and by deriving insights from the detailed interview data collected during this study.

Table 1 Research questions

<table>
<thead>
<tr>
<th>What is the role of network coordination in the business incubation process?</th>
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<tr>
<td>• How does the incubator coordinate its network in different stages of the business incubation process?</td>
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<td>• What value is derived for the incubatees through the incubator’s network?</td>
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<tr>
<td>• What are the challenges in network coordination?</td>
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<td>• What are the similarities and/or differences of Finnish and Russian business incubators’ network coordination?</td>
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Thus, this paper broaches a key, unexplored issue in network management and business incubation, with implications for researchers in strategic management, network theory and business incubation theory. The study contributes to the literature on network coordination by offering new insights and empirical evidence on network coordination practices. The novelty of the approach lies in the unexplored context and its comparative nature. The research aims to provide researches with a deeper understanding of the theory of network coordination as it is applied in the environment of business incubators, and of the theory of business incubation as it is examined from a novel point of view. Finally, the study makes a managerial contribution by providing insights on the role and mechanisms of network coordination for
managers of business incubators that will allow them to increase the process effectiveness.

1.3 Research design & methodology

The research design of this study is presented in Figure 2. The research philosophy of this study is interpretivism. The nature of reality is seen as socially constructed, subjective and subject to change as the world of business and management is far too complex to be theorized only by fixed laws (Saunders, et al., 2009).

This study is approached from the abductive research perspective, which combines both deductive and inductive research approaches. Deduction means using an existing theory to formulate research questions, objectives and framework, and to organize and direct data analysis (Yin, 2009). Whereas, with induction the data is collected at first and a theory is then developed as a result of the data collection. A topic on which there is a lot of existing literature from which you can define a theoretical framework and hypotheses is more natural to be researched deductively. However, when researching a new and debated topic, it might be better to approach it inductively by generating data and analyzing and reflecting upon what theoretical themes and data are suggesting. Often deductive approach is applied only to quantitative analysis, and a debate exists on using the approach in qualitative research. The argument is that if a theory is already known, it might affect the research process negatively, and there is a possibility of introducing a premature closure on the research issue, and a risk of the theory departing from the view of participants in a social setting. (Saunders, et al., 2009) Thus, to avoid the aforementioned pitfall, both induction and deduction are used in the research. The existing literature on the research topics was used to formulate the research questions, objectives, theoretical framework and to guide and organize the data collection and analysis. However, space for the occurrence of new finding is left as well for generalizations deriving from the data. Therefore, it can be said that the
research moves from theory to data and vice versa, or in other words, adopts an abductive approach.

The purpose of the research is exploratory. According to Saunders et al. (2009) the exploratory research is especially useful for clarifying an understanding of a problem, which precise nature is unsure, as it is in this research case. A search of the literature, interviewing experts in the subject and conducting focus group interviews are the main ways of conducting such a research.

The strategy of the research is the multiple-case study method. A multiple case study enables the researcher to explore differences within and between cases. Two cases from Finland and two cases from Russia were selected for the research in order to be able to compare the results of the study in different contexts. Multiple-case studies are preferred, because they can be
more robust than a single case study and, depending on the results, can strengthen the external validity. Case studies can be further classified as holistic or embedded depending on how many unit of analysis they involve. Holistic case studies focus on a single unit of analysis whereas embedded designs study multiple units of analysis within the case. This study examines network coordination in business incubation, i.e. focuses only on a specific unit of analysis, so it can be said that our research design is holistic. (Yin, 2009)

The methodical choice of this study is mono method qualitative. Qualitative research seeks to understand phenomena in context-specific settings (Golafshani, 2003) and is defined as any kind of research that uses data or produces findings that are not quantifiable or statistical (Strauss & Corbin, 1990). Moreover, qualitative is used as a synonym for any data collection technique or data analysis procedure that produces or uses non-numerical data. This data is based on meanings expressed through words and the results are collected in non-standardized data requiring classification into categories, and the data analysis is conducted through the use of conceptualization. (Saunders, et al., 2009) The time horizon of the research is cross-sectional meaning that a particular phenomenon is studied at a particular time. The network coordination of business incubators was researched at the time conducting the research.

Primary data is used in the empirical part of the research. The primary data-collection method is the semi-structured interview. Tuomi & Sarajärvi (2009) point out that with interviews it is possible to collect valid, reliable, rich and detailed set of data that are relevant to the research questions and objectives of the study. The interviews of overall 16 informants were carried out in March and April of 2014, of which 14 were chosen to be studied. The informants were directors and managers of the incubators and CEOs and/or founders of the incubating firms. The interviews were recorded, and subsequently transcribed and analyzed by using the content analysis
method. A more detailed description of the empirical research methods including data collection and analysis is provided in Chapter 5.

1.4 Structure of the thesis

The study is organized as follows. First, multiple bodies of literature are integrated to develop a framework for the research topic. Next, the theoretical model developed is elaborated. Further, the data analysis and collection methods are described in detail, and the case environment and cases, which are under investigation will be presented. Then the results of the data analysis are presented. And, finally conclusions are drawn together with theoretical and managerial implications of the study as well as limitations and suggestions for future research. The structure of the study is presented in Figure 3.

Figure 3 Structure of the study
2 NETWORK COORDINATION – THEORETICAL UNDERPINNINGS

Dyer & Nobeoka (2000) suggest that a network can be superior to a firm as an organizational form if it can create a strong identity and coordination rules. A firm’s ability to develop and manage successfully its relationships with other firms can be seen as a core competence, and as a source of competitive advantage (Ritter, et al., 2004).

The problem of managing networks has been mainly approached from two different perspectives (e.g. Ritter, et al., 2004; Möller & Svahn, 2003). The Strategic Networks approach suggests that networks include intentionally created structures, negotiated roles and goals, and that they can and should be managed in order to be efficient. This view accepts the idea of a hub firm in networks, and thereby agrees that a network can be developed or managed by a single actor. (Möller & Rajala, 2007; Gulati, et al., 2000). On the other hand the Network Approach sees networks as self-organizing and weakly manageable. It argues that networks cannot be designed, managed nor coordinated by a single actor. (Möller & Rajala, 2007; Håkansson & Ford, 2002) Moreover, the approach indirectly suggests that management or any control within a network decreases its efficiency and innovativeness as it makes the network hierarchical (Heikkinen & Tähtinen, 2006). Therefore, network management should be avoided (Håkansson & Ford, 2002).

Although significant differences on the assumed role of management and manageability exist between these two views (Heikkinen & Tähtinen, 2006; Ritter, et al., 2004), they have recently come closer in research. Ritala et al. (2012) combined these two views in their investigation of coordination mechanisms in innovation-generating business networks. Network coordination is seen as combining network management and network orchestration. Network management refers to a more traditional view of management including having a leader in the network, setting goals and timetables, monitoring, and creating organized structures for coordinated
collaboration (Möller & Rajala, 2007; Ritala, et al., 2012). Whereas, Dhanaraj & Parkhe (2006) suggest that hub firms can orchestrate its network to ensure the creation and capture of value, without using the commanding power of traditional hierarchical management. Thus, network orchestration refers to enabling and facilitating the coordination of the network by subtly influencing other actors and creating the premises for knowledge exchange, value creation and capture, and innovation (Dhanaraj & Parkhe, 2006; Ritala, et al., 2009; Ritala, et al., 2012). Moreover, Marques et al. (2011) studied the use of management control mechanisms by public organizations with a network coordination role. They found that the nature and use of management control mechanisms seems to be shaped by the coordinator’s assessment of motivations to cooperate and of the network members’ contribution to network performance. In addition, Gardet & Mothe (2012) studied the coordination modes in an innovation network, which was led by a SME.

Furthermore, the coordination of networks varies along with the existence of different kinds of networks (Möller & Rajala, 2007). It is affected by various issues, such as the number of involved actors, the power balance, the goals of the network, organization of knowledge exchange, phase of the network evolution and industry and economic context. However, researchers have identified that that existing literature does not explain in which situations different forms of coordination would function best. (Ritala, et al., 2012)

Complying with Ritter et al. (2004), Möller & Rajala (2007) and Ritala et al. (2012) this study recognizes the importance and co-existence of both of these views, “coordination by commanding” and “coordination by enabling”, in understanding different types of relationships and network coordination in the context of business incubation.

2.1 Defining a network

The volume of network research has increased drastically in the last decades, and currently a vast amount of many-sided scientific discussion exists around networks (Santoro, et al., 2006). However, at the same time the discussion is quite fragmented and diverse. The accurate definition for
the term network is hard to find although various definitions exists. The
terminology of networks is not yet fully established and therefore the term is
used in various contexts and with multiple meanings. In literature networks
might also be referred to with other terms, such as nets, joint ventures,
alliances or collaborations.

In its most abstract form network can be defined as “a set of nodes and the
set of ties representing some relationship, or lack of relationship, between the
nodes”, where the nodes can represent different actors, such as organizations, teams, individuals, concepts etc. (Brass, et al., 2004, p. 795). The word network originates from the Latin word “retis”, which refers to a
type of web to capture small game and animals. Thus, a network is originally
related to capturing something. Therefore, networks can be seen also as
instruments for resource, for instance knowledge, capture. (Santoro, et al.,
2006)

Moreover, Doz et al. (2000) argued that networks are dynamic, that they
involve relational and embedded ties, and that they may be beneficial but
also constraining. Brass et al. (2004) emphasize that networks transfer
information that brings about attitude similarity, imitation, and generation of
innovations, and mediate transactions among organizations and cooperation
among individuals. In addition, they give differential access to resources and
power. Networks offer organizations collective benefits, such as increased
efficiency, as the division of tasks allows network member to focus on their
own core competences. Pursuing major innovations alone is no longer
possible for organizations, and therefore, firms seek for joint creation of
knowledge and innovations via networking. Moreover, networks of
organizations producing complementary products and services can offer end
customers better value by offering them “all of the pieces of the puzzle”.
(Möller & Svahn, 2003) Gulati et al. (2000) studied networks from a strategy
perspective, and defined a strategic network as “the locus of a firm’s potential
and realized web of relationships, which are composed of enduring inter-firm
ties that are of strategic significance to the firm.” Recent theoretical
developments suggest that the likelihood of value creation increases when a BI is structured as a strategic network (Hughes, et al., 2007).

Networks can also be characterized by their structure or density. First, networks can be divided into formal and informal networks. The formality or informality of communication and knowledge transfer can be based on social networks. Formal social networks are set and intentionally created by management, whereas, informal social networks are ungoverned organic structures which connect potentially unbounded group of individuals. In the business context informal networks extend also across organizational boundaries, and comprise of relationships between actors not found in organizational structures. It has been found that often informal networks do not represent the formal structures, which can be a barrier to efficient knowledge exchange within an organization. (Allen, et al., 2007) Second, network density is the extent to which an actor's contacts are interconnected. The denser a network is, the less likely new actors and resources will join and more likely resources will recirculate within the already established network. (Hoang & Antoncic, 2003) In loosely coupled systems the density of a network is low.

2.1.1 Levels of analysis

All network research needs to take into consideration the levels of analysis investigated. The unit of analysis can be, for instance, industry as a network, the relationships of a certain network or actor in it, a relationship or a dyad, a portfolio, or a single interaction. (Heikkinen & Tähtinen, 2006) Brass et al.'s (2004) research on the antecedents and consequences of networks provides a wide overview of network research at the three levels of analysis; interpersonal, interunit and interorganizational. The interpersonal level of networks comprises of individual people as actors, whereas the interunit level considers groups as actors. Moreover, interorganizational level of analysis sees organizations as actors. These networks include suppliers, marketing and distribution network, technological-innovation and product development
networks, and various competitive collaborations (Möller & Svahn, 2003). This research focuses on Interorganizational networks.

### 2.1.2 Classification

Networks can be classified in various ways. A classification appropriate for this research is presented by Möller & Rajala (2007). They introduce a classification of networks based on the idea of different value systems. Value system in this context is defined as a set of certain activities carried out by the actors of the network. The activities are done with the resources and capabilities they control and/or coordinate. Determination of the system is the key characterizing variable of the value system. Thus, how well known are the value activities and the capabilities of the network and how can they be explicitly specified. The classification framework is presented in Figure 4.

Figure 4 Business network classification framework (adapted from (Möller & Rajala, 2007))

<table>
<thead>
<tr>
<th>Current business nets</th>
<th>Business renewal nets</th>
<th>Emerging business nets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical demand-supply networks</td>
<td>Business renewal networks</td>
<td>Application innovation networks</td>
</tr>
<tr>
<td>Horizontal market networks</td>
<td>Customer solution networks</td>
<td>Dominant design networks</td>
</tr>
<tr>
<td>High-level of determination</td>
<td>Established value system, incremental improvements</td>
<td>Networks</td>
</tr>
<tr>
<td>Stable, well-defined value system</td>
<td>- Well-known value systems</td>
<td>- Emerging new value systems</td>
</tr>
<tr>
<td>- Well-known and specified value activities, actors, technologies and business processes</td>
<td>- Change through local and incremental modifications within the existing value system</td>
<td>- Old and new actors</td>
</tr>
<tr>
<td>- Stable value systems</td>
<td>- Established value system, radical changes</td>
<td>- Radical changes in old value activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Creation of new value activities and actors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Radical system-wide change</td>
</tr>
</tbody>
</table>

Current business networks have stable and well-defined value systems and they aim mainly at achieving efficiency through demand-supply coordination, whereas, business renewal nets possess established value systems and aim for local business process improvements by incremental innovation. Moreover, emerging value systems and radical changes are identified with emerging business nets, such as innovation networks. Emerging business
networks seek radical innovation and business system change. (Möller & Rajala, 2007)

The networks investigated in this study, business incubator networks, fall mainly into the middle of the continuum; the business renewal nets category. The value systems in these networks are based on current established value-creation systems, and therefore are already relatively well determined. However, the actors in the network modify them through incremental and local innovation activities in order to improve the value systems. In business renewal nets creating new specialized knowledge, which requires the capability of uniting different actors, is important. The hub firm's ability to manage multi-functional and multi-actor teams and creation of trusting collaboration underpins this social character of knowledge production. Furthermore, business incubator networks can be defined as customer solution networks. The incubator network is hub-driven and formed of various collaborative actors. Moreover, the customers of incubators, the incubatees each demand a customized solution in a project based manner. The network structure of renewal nets is usually diagonal comprising of actors from both vertical and horizontal dimensions. (Möller & Rajala, 2007)

However, it is important to bear in mind that networks may be interrelated through actors which have roles in various networks (Möller & Rajala, 2007). The business incubator network shares some characteristics of innovation network networks as well since one of their aim is commercializing innovations. Likewise, incubators are part of the incubatees’ networks, therefore they can be considered as part of their innovation networks, if the incubatee is innovating. Innovation networks can be defined loosely coupled systems of autonomous firms including a focal firm and its stakeholders, such as customers, suppliers, partners and competitors (Möller & Rajala, 2007; Ritala, et al., 2012; Dhanaraj & Parkhe, 2006). The aim of innovation networks is to produce new or modified sources of value for the actors involved and relevant external stakeholders in a sustainable way (Freeman, et al., 2004; Ritala, et al., 2012). A focal firm i.e. a hub firm has prominence
and power, which come from its central position in the network structure and its individual attributes. Thereby the hub firm has the power to bring together dispersed resources and capabilities of its network members. (Dhanaraj & Parkhe, 2006)

### 2.2 Network management

Prior research on network management is limited, and thus includes only few approaches for managing business networks (Ojasalo, 2008; Ritter, et al., 2004). As networks can be analyzed in different levels, so can their management as well. Möller & Halinen (Möller & Halinen, 1999) propose that network management consists of four basic levels, which are:

1) industries as networks level – involving network visioning;
2) firms in networks level – involving net management;
3) relationship portfolios level – involving portfolio management; and
4) exchange relationship level – involving relationship management.

Moreover, Ritter et al. (2004) continue analyzing the levels of management, and add that the first level of management should be the individual actor viewed in isolation. However, no organization can be viewed in isolation and therefore calls for management attention on different levels. The next level is that of the individual dyad, which is equivalent to the exchange relationship level presented in Möller & Halinen’s (1999) framework. The portfolio level refers to an individual actor or firm, which is simultaneously involved in a number of relationships. The management tasks required in portfolio management include, for instance, allocating resources to different relationships and managing interactions with each relationship. In addition, Ritter et al. (2004) distinguish a separate level of management, in which the actor is not directly involved, such as indirect connections between a firm and its customer’s customers. Dealing with indirect effects of management action needs to be addressed at this level.
Ritter et al. (2004) argue that business relationships and network management involves two kinds of tasks: relationship-specific and cross-relational tasks. Relationship-specific tasks are referred to as exchange and coordination aimed at initiating, using, developing, routinizing, and dissolving the relationship. Whereas, Cross-relational tasks include planning, organizing, staffing, and controlling aimed at dividing the overall value creation system into work packages and coordinating and integrating those.

Furthermore, Ford et al. (2002) present a model of managing in networks consisting of network pictures, networking, and network outcomes. Network pictures refer to how the network members see the network. This picture is the basis for their analysis and actions in the network. Furthermore, networking includes all of the interactions of an actor in the network. Networking consists of three aspects: choices about working within relationships, choices about network position, and choices about how to network. Networks constantly produce multiple network outcomes, which nature can be understood in terms of actors, activities and resources.

Ojasalo (2004) introduces a systematic approach for managing networks – key network management by expanding the ideas of key account management into the network context. Key network is a set of actors mobilized by the hub company to realize an opportunity. The key network management approach comprises of three factors:

1) identifying a key network;
2) selecting strategies for managing actors of the key network; and
3) developing and applying operational level methods for managing actors of a key network.

In addition, Ojasalo (2008) studied the management of inter-organizational innovation networks, and identified various aspects that are important in understanding the nature of innovation network management. Those aspects are: duration, primary reward, the fundamental meaning, nature of networked
organization, planning, controlling, trust, hierarchies, authority and coordination. Thus, by focusing on these aspects it is possible to comprehensively understand how a company manages its innovation network.

Möller & Rajala (2007) studied the management of intentionally created business networks. They suggest that effective management of different types of networks depends on the value creation logic of the network. Specific management mechanisms are suggested for each type of networks, which were presented in the previous subchapter (Figure 4). The management mechanisms appropriate for this research are related to both of the types of business renewal nets; business renewal nets and customer solutions nets (see Table 2). The management mechanisms related to innovation networks are discussed in the following chapter.

Table 2 Management mechanisms (adapted from Möller & Rajala, 2007)

<table>
<thead>
<tr>
<th>Network type</th>
<th>Management mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business renewal networks</td>
<td>• Pooled and reciprocal interdependence</td>
</tr>
<tr>
<td></td>
<td>• Coordination of dispersed resources</td>
</tr>
<tr>
<td></td>
<td>• Bridging borders of both the involved firms and communities of practice</td>
</tr>
<tr>
<td></td>
<td>• Coordinated collaboration</td>
</tr>
<tr>
<td></td>
<td>• Trusting culture, enhancing joint-development</td>
</tr>
<tr>
<td></td>
<td>• Motivating partners (sharing benefits)</td>
</tr>
<tr>
<td></td>
<td>• Balancing with tight and loose coupling</td>
</tr>
<tr>
<td>Customer solution networks</td>
<td>• Serial, pooled, and reciprocal interdependence (coordination and scheduling)</td>
</tr>
<tr>
<td></td>
<td>• Systems for rapid establishment of customer project</td>
</tr>
<tr>
<td></td>
<td>• Advanced project management systems</td>
</tr>
<tr>
<td></td>
<td>• Advanced systems for sharing benefits</td>
</tr>
<tr>
<td></td>
<td>• Balancing with tight and loose coupling</td>
</tr>
</tbody>
</table>

Customer solution networks and business renewal networks share a lot of features. In the management of business renewal nets collective action is
needed as resources and competencies are dispersed among various members due to firm specialization. These types of networks usually have explicit goals and timetables, and they are organized as multiparty projects. Whereas, customer solution networks are formed by group of organizations with complementary resources and competences to provide the optimal solution for customers on a project basis. The group of partners is decided on the basis of the project’s objective. Moreover, the actors in these networks are highly interrelated. Therefore they need solve serial, pooled, and reciprocal interdependence issues as the output of one stage would correspondingly be the input to the other leading to serial interdependence. In fact, pooled interdependence is a result of limited qualified employees, which need to be pooled between projects. The pooling calls for understanding what kind of expertise is needed in the project, and thus the competences and capacity of each network member needs to be known. (Möller & Rajala, 2007)

Important part of both type of networks, business renewal and customer solution, is to be able to expand the knowledge in the network through collaborative learning. The significance of joint knowledge production increases the more adjustments and new solutions the project requires. A challenge for this task poses the embeddedness of members’ partly explicit and partly tacit knowledge in people and routines. In addition, the social character of knowledge production stresses the capability of bridging the borders of involved organizations and their communities of practice. (Möller & Rajala, 2007)

2.3 Network orchestration

Some types of networks have specific characteristics that may restrict their management and coordination potential. However, some hub firms may be in the position and possess capabilities that allow them to discreetly influence the network and organizations in it without traditional management and the feel of hierarchy. (Ritala, et al., 2012) This influence, or orchestration, is defined by Möller et al. (2005) as an actor’s capacity to affect the
development of a whole business network by trying to influence the beliefs, goals and behavior of other actors in it. Orchestration is seen resembling enabling coordination rather than traditional strict management (Ritala, et al., 2009).

Nambisan & Sawhney (2011) explored the nature of a hub firm’s orchestration process in network-centric innovation by combining insights from product development, network theory, and evidence from practice. The study identifies three critical orchestration processes: managing innovation leverage, managing innovation coherence, and managing innovation appropriability. Managing innovation leverage refers to the hub firms tasks to enable the reuse of technologies, processes, or other innovations assets between network members. Furthermore, managing innovation coherence refers to the coherence of the innovative activities and outputs of the network, which management require a hub firm to predict and champion changes in the network. Last, managing innovation appropriability will be discussed later in this chapter.

Figure 5 A framework for orchestration in innovation networks (Dhanaraj & Parkhe, 2006)
Dhanaraj & Parkhe (2006) studied orchestration of innovation networks. They network orchestration as a set of deliberate, purposeful actions taken by the hub firm as it seeks to create and capture value from the network. This process includes three different dimensions: knowledge mobility, innovation appropriability and network stability (see Figure 5).

**2.3.1 Knowledge mobility**

Knowledge mobility refers to sharing, acquiring and deploying knowledge within the network. The hub firm as the orchestrator is responsible for enhancing knowledge mobility and leveraging competencies in the network. To enhance knowledge mobility the hub firm needs to concentrate on three specific processes: knowledge absorption, network identification, and inter-organizational socialization. In addition, the hub firm should strengthen the common identity among network members, because it is crucial for motivating members to participate and share knowledge (Dyer & Nobeoka, 2000). A hub firm can enhance socialization and knowledge mobility within the network through exchange forums and formal and informal communication channels both within and outside immediate organizational tasks. When the hub firm is able to assess and understand the value of knowledge in different parts of the network, can organize its transfer to other parts of the network (Gulati, et al., 2000) is capable of learning from other network members and can use resources that are made available through the network relationship it will successfully promote knowledge mobility. (Dhanaraj & Parkhe, 2006)

**2.3.2 Innovation appropriability**

The second task of orchestration, innovation appropriability, refers to the environmental elements that “govern an innovator's ability to capture the profits generated by an innovation” (Teece, 1986, p. 287). It should be taking into notice, because the distribution of knowledge within a network may bring along problems of free riding and opportunism (Dhanaraj & Parkhe, 2006). Free rider is a member of the network who enjoys the benefits of the knowledge flow, but does not contribute the same way as others to its
establishment and/or maintenance (Dyer & Nobeoka, 2000). Opportunism refers to taking advantage of the openness of other members in the network, or taking away the potential commercialization of new ideas unfairly. The hub firm can take the responsibility of equal distribution of value within the network. By focusing on trust, reciprocity, rich information sharing, joint problem solving, procedural justice and joint asset ownership, it can reduce the appropriability concerns in the network. It is suggested, that that the strength of an appropriability system is mainly based on relying on social interactions with partners, as well as using trust and reciprocity, rich information sharing and joint problem solving, rather than relying on written contracts. Thus, an important task of the hub firm is building and supporting trust, and communicating sanctions for trust abuse. Thus, innovation may be facilitated or smothered depending on the appropriability regime created by the orchestrator organization. (Dhanaraj & Parkhe, 2006)

2.3.3 Network stability

The greater the stability of a network is the higher are the network’s value creation capabilities (Lorenzoni & Lipparini, 1999). Thus, a network that is unstable is not favorable for value creation or value extraction. Therefore one of the most important orchestration tasks for hub firms is promotion of network stability. Network instability can occur in various ways, such as isolation, migration cliques, and attrition. Members may become isolated and break their connections to the network, or they might move to competing networks if they are seen more favorable for them. Likewise, some actors may want to create cliques, and thereby reduce their ties to hub firms. Networks may also slowly wear away, if they are loosely coupled. Thus, Dhanaraj & Parkhe (2006) argue that the networks stability can be increased by the hub firms in different ways: "by enhancing reputation, by lengthening the shadow of the future, and by building multiplexity". A strong hub firm reputation discourages actors’ attempts to disconnect from it and at the same time encourages the formation of new connections. Network multiplexity refers to two or more types of relationships happening together. Hub firm can
enhance multiplexity by doing additional projects with network members or by encouraging networks members to work together.

2.4 Network organizations

According to Doz et al. (2000) a network can be superior to a firm as an organizational form if it is able to create a strong identity and coordination guidelines. Network organizations can be viewed from few perspectives. A behavioral view focuses on the social relations, and thus sees the network organization as a set of actors, such as persons, groups or organizations. Moreover, it is referred to as an environment around which people organize themselves to reach a common goal. (Sailer, 1978) A strategic approach defines network organizations as “long term purposeful arrangements among distinct but related for-profit organizations, which allow those firms therein to gain or sustain competitive advantage” (Jarillo, 1988).

Santoro et al. studied (2006) geographically disperse network organizations and their collaborative environments for support to knowledge sharing and coordination of actions. Moreover, they focused on network organizations in which members are volunteers, and therefore do not follow a traditional hierarchy. In addition, these organizations have few resources to support expensive technological infrastructure. They identified that mainly all of the views on network organizations are connected with the need to manage their members’ knowledge in order to achieve goals with minimum effort.

Van Alstyne (1997) defined network organizations by their structure, process and purpose elements. From the structural point of view, a network organization combines co-specialized assets under shared control. Procedurally, it supports its members’ actions via their roles and positions within the network organization. In addition, a network organization needs a common purpose and a sense of identity to define strategy and objectives. Without a common purpose members are not aware whether actions are directed towards cooperative gains.
3 BUSINESS INCUBATION – THEORETICAL UNDERPINNINGS

This chapter presents prior scientific discussion on business incubation. First, the preconditions for the development of the phenomenon are introduced. Then the origin of the concept and its definitions are discussed. Moreover, various incubator types are presented, and business incubation is discussed as a process. Last, theoretical approaches, relevant for this study, explaining business incubation are analyzed.

3.1 Preconditions for business incubation development

No organization, BIs included, can be researched in isolation. Therefore, it is crucial to understand the larger framework where BIs operate, as well as what is their role from the innovation systems perspective. Previous research suggests that business incubation is moderated by the state of the economy (Hackett & Dilts, 2004a), country specific institutional factors, such as government policy, investment decisions, as well as by the relevant innovation systems (Freeman, 1987; Lundvall, 2007). BIs constitute one element of innovative infrastructure in the innovation systems they are part of acting as distributors and mediators of knowledge. The preconditions for business incubation development are presented in the following chapters.

3.1.1 National innovation systems

Innovations in an economy can be understood from a systems approach. The systems approach acknowledges that innovation does not happen in isolation, but rather in interaction with various organizations within the framework of specific institutional guidelines (Edquist, 1999). Thus, innovation is seen as a process, which cannot be executed by one innovation actor alone. But, rather it requires lots of resources and has a high level of risk, thus calling for close cooperation of different actors. (Chung, 2002; Doloreux, 2002)
Based on the importance of knowledge in modern economy and the nature of innovation, the concept of National Innovation Systems (NIS) appeared in the mid-1980s, and since that it has gained a lot of attention among scholars as well as policy makers (Sharif, 2006; Lundvall, 2007). Originally Freeman (1987) defined NIS as “the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies”. Although various definitions exist, the basic characteristics of NSI are the institutional setup related to innovation, and the underlying production system. Thus, NSI is a set of interrelated institutions, such as firms, universities, public agencies, that produce, diffuse and adapt innovations. These institutions are connected by knowledge, financial, human, regulatory, and commercial flows. (Niosi, 2002)

Moreover, Kitanovic (2007) suggests that the main components of innovation systems are institutions and organizations. First, institutions are the rules of the game; laws, constitutions, common habits, routines, rules and norms that regulate connections between actors within as well as outside organizations. Institutions affect innovation as innovations are mainly results of interactive learning processes between various actors. Organizations, on the other hand, can be divided into private and public organization. The central private organizations for innovation are companies. Whereas, the public organizations can be divided into three categories: innovation-oriented knowledge producers (e.g. universities, research institutes), distributors of knowledge (e.g. science parks, BIs), and knowledge regulators (e.g. patent offices). (Kitanovic, 2007)

Furthermore, Lundvall (2007) makes a distinction in the narrow and broad definitions of NIS. The narrow approach focuses only on the institutions, which are mainly the sources of innovations. Whereas, the broad definition acknowledges that these institutions are part of a wider socio-economic system, which is impacted by economic policies as well as political and cultural influences, and recognizes the effect of these to the innovation
activities. (Lundvall, 2007; Freeman, 2002) Innovation policies guide the development of innovation systems.

### 3.1.2 Regional innovation systems & clusters

A more recently emerged concept, the concept of Regional Innovation Systems (RIS), which originated from the NIS model (Doloreux, 2002), has gained significant attention since the early 1990s as a framework for understanding innovation processes at the regional level (Doloreux & Parto, 2005). In comparison to NIS, RIS focuses on regions, which is an area less than a national state, and which has is seen to encompass unique administrative, cultural, politic, or economic power and cohesiveness (Cooke, et al., 1998). Thus, RIS can be defined as “the institutional infrastructure supporting innovation within the production structure of a region” (Asheim & Coenen, 2005). Moreover, RISs can be seen as tools to develop effective NISs.

In addition, the concept of clusters, introduced by Porter (1990), is closely related and overlaps with the concept of RIS; yet, a clear distinction exists between them. The concept of clusters is narrower as it focuses on interdependent organizations in a specific sector, whereas RIS stretches across several sectors (Asheim & Coenen, 2005). Moreover, several clusters and many industries belong to RIS and in RIS institutions play a bigger role (Tödtling & Trippl, 2005). Porter (2000) defines a cluster as “a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities”. However, clusters do not contain entities only from one industry, but encompasses actors important to competition from linked industries. The advantage of cluster development is that it increases the productivity of its firms or industries, and the capacity of its members for innovation and productivity growth, as well as fuels new business formation that supports innovations and grows the cluster. In fact, clusters create a synergy effect. Although globalization has changed the traditional roles of location, geographic
concentrations of interconnected companies, clusters, can be found almost in every economy. (Porter, 2000)

3.2 Incubator definitions

The first known business incubator was established already in the late 1950s in USA and research on the issue began in the middle of 1980s (Hackett & Dilts, 2004). Although business incubation is not a new phenomenon, theoretical knowledge on business incubation remains limited and scattered around different research areas (Hackett & Dilts, 2004; Tavoletti, 2013).

Business incubators nurture young firms, helping them to survive and grow during the start-up period when they are most vulnerable (Aernoudt, 2004). The term business incubator (BI) is often seen as an “umbrella word” covering a wide range of activities, services, approaches and objectives (Aernoudt, 2004). The scientific literature and practice provides many definitions to describe the multifaceted phenomenon of BIs.

Figure 6 Incubator-incubation concept map (Hackett & Dilts, 2004)
Hackett & Dilts (2004) define BI as “a shared office-space facility that seeks to provide its incubatees (i.e. “portfolio-” or “client-” or “tenant-companies”) with a strategic, value-adding intervention system (i.e. business incubation) of monitoring and business assistance”. The BI system controls and connects resources with the goal of facilitating the successful new venture development of the incubatees while simultaneously covering the cost of their possible failure. Incubatees are the residents i.e. clients of the incubators. The incubator-incubation concept is presented graphically in Figure 6.

Business incubation can be defined also as a strategy for facilitating new business development and survivability of new enterprises (Hackett & Dilts, 2004; Abduh, et al., 2007). Furthermore, BIs can be defined as environments for initiation and growth of young firms (Aerts, et al., 2007; Chan & Lau, 2005), that provide resources such as facilities, objectives, marketing, management, structure and financing to new knowledge- and technology-intensive companies aiming to accelerate the process from initiation towards growth (Aaboen, 2009). Bergek & Norrman’s (2008) literature review on BIs found that previous studies four components of BI’s have received particular attention:

1) shared office space, which is rented under more or less favorable conditions to incubatees,
2) a pool of shared support services to reduce overhead costs,
3) professional business support or advice (“coaching”) and
4) network provision, internal and/or external.

Rice (2002), in his study co-production of business assistance in business incubators, refers to coworking spaces as “passive environmental intervention”. By providing this space and services connected to it, the BI provides a supportive environment for the entrepreneurs, and thereby supports firm survival. However, Tavoletti (2013) points out that due the development of new technologies and the opportunity to work virtually, the concepts of protected and shared office space can also be extended to
“virtual space”. Thus, virtual incubators are incubators that offer business assistance services to incubatees who are not co-located within the incubator physically (Hackett & Dilts, 2004).

Nevertheless, Bergek & Norrman (2008) suggest that there are only three main components, which distinguish incubators from each other; selection, business support and mediation. First, selection is an important incubator management task because it forms the base for effective resource allocation both from incubator and general economy perspectives. Incubators need to distinguish the ideas, teams or companies which are weak but promising while avoiding those that don’t need help through business incubation as well as those that cannot be helped. Different incubators have different selection criteria, and levels of strictness in applying the criteria. The selection criteria can be mainly classified as idea-focused and entrepreneur-focused criteria. With the idea-focused approach incubator managers evaluate the viability of ideas, whereas, with the entrepreneur-focused approach the focus is on assessing the knowledge and capabilities of the entrepreneurs. Furthermore, the incubator may use the “picking-the-winners” approach and select only the most potentially successful ventures. Or, it can utilize the “survival-of-the-fittest” approach and take a larger number of companies and rely on markets to filter the success stories out of the mass.

Furthermore, business support services comprise of entrepreneurial training and business development advice, and general business services, e.g. accounting and legal matters. Last, mediation refers to the incubators role to act as an intermediary between incubatees and innovation systems (Peters, et al., 2004). The incubator connects incubatees with its environment in order to leverage entrepreneurial talent and/or resources (Bøllingtoft & Ulhøi, 2005; Grimaldi & Grandi, 2005). Important resources for incubatees are, for instance, knowledge, financial and human capital. Moreover, Bergek & Norrman (2008) identify network mediation referring to incubator matching incubatees with other actors with the objective of filling gaps in incubatees’ established networks. In addition, their research suggests that incubators
may also engage in institutional mediation, which means that incubators may help incubatees understand the institutional demand by regulations, laws, traditions, values, norms and cognitive rules.

Based on the review of earlier BI research Hackett & Dilts (2004) suggest the following value offering:

Table 3 Incubator value offering (adapted from Hackett & Dilts, 2004).

<table>
<thead>
<tr>
<th>Sources of value: Incubator to community</th>
<th>Sources of value: Incubator to incubatee</th>
<th>Sources of value: Incubatee to community and incubator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designed to cultural values of community</td>
<td>Credibility</td>
<td>Economic development</td>
</tr>
<tr>
<td>Communication with community leaders</td>
<td>Diagnoses of business needs</td>
<td>Technology diversification</td>
</tr>
<tr>
<td></td>
<td>Selection &amp; monitoring</td>
<td>Job creation</td>
</tr>
<tr>
<td></td>
<td>Access to capital</td>
<td>Profits</td>
</tr>
<tr>
<td></td>
<td>Access to network of experts &amp; support systems</td>
<td>Viable firms</td>
</tr>
<tr>
<td></td>
<td>Faster learning &amp; solutions to problems</td>
<td>Successful products</td>
</tr>
</tbody>
</table>

Moreover, Hackett & Dilts (2004) highlight that the incubator is not just a shared-space office facility, infrastructure and mission statement; rather, it is also a network of individuals and organizations. This network comprises of various actors, such as the incubator management and staff, incubator advisory board, incubatees, local universities, industry contacts, and professional services providers (e.g. lawyers, accountants, consultants, marketing specialists, venture capitalists, angel investors, and volunteers). According to Westhead & Batstone (1998) it is in fact the connections within the environment as a whole that makes innovation happen rather than the individual firms.

The success of a BI can be measured by the number of new, young ventures with growth potential, an optimal rotation rate and a high survival rate of graduates. Furthermore, a good BI has a positive impact on the perception of
entrepreneurs and on the creation of an entrepreneurial culture, strong links with industry, R&D centers and universities. And, finally successful BIs have should have structure that facilitates access to financial markets. (Aernoudt, 2004)

3.3 Incubator types

According to the National Business Incubation Association (NBIA) (2014), the world’s leading organization of BIs based in the USA, the main goal of a BI is to produce successful companies that will leave the program financially viable and freestanding. In addition, incubator graduates have the potential to create new jobs, revitalize neighborhoods, commercialize new technologies, and strengthen local and national economies. However, there are various ways in which BIs are organized and what objectives they have.

First, BIs can be categorized on the basis of their financial sponsorship into four types; publicly-sponsored, nonprofit-sponsored, university-sponsored and privately-sponsored (Hackett & Dilts, 2004). Second, Grimaldi & Grandi (2005) divide incubators into four groups; Business Innovation Centers, University Business Incubators, Independent Private Incubators and Corporate Private Incubators. This classification is done based on the incubators’ characterizing variables, which include its institutional mission / strategy (non-profit vs. profit oriented), industrial sector, location, market, origin of ideas, phase of intervention, incubation period, sources of revenue, services offered and management teams. Moreover, Aernoudt (2004) classifies incubators into five categories according to their main objectives as presented in Table 4 (Aernoudt, 2004). Lastly, Von Zedtwitz & Grimaldi (2006) found five types of incubators based on the management of the core services. These types are regional business incubators, university incubators, virtual incubators, independent commercial incubators and company-internal incubators.
Table 4 Typology of business incubators (adapted from Aernoudt, 2004)

<table>
<thead>
<tr>
<th></th>
<th>Main philosophy: dealing with</th>
<th>Main objective</th>
<th>Secondary</th>
<th>Sectors involved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed incubators</strong></td>
<td>Business gap</td>
<td>Create startups</td>
<td>Employment creation</td>
<td>All sectors</td>
</tr>
<tr>
<td><strong>Economic development incubators</strong></td>
<td>Regional or local disparity gap</td>
<td>Regional development</td>
<td>Business creation</td>
<td>All sectors</td>
</tr>
<tr>
<td><strong>Technology incubators</strong></td>
<td>Entrepreneurial gap</td>
<td>Create entrepreneurship</td>
<td>Stimulate innovation, technology startups and graduates</td>
<td>Technology</td>
</tr>
<tr>
<td><strong>Social incubators</strong></td>
<td>Social gap</td>
<td>Integration of social categories</td>
<td>Employment creation</td>
<td>Non-profit sector</td>
</tr>
<tr>
<td><strong>Business research Incubators</strong></td>
<td>Discovery gap</td>
<td>Bleu-Sky research</td>
<td>Spin-offs</td>
<td>High tech</td>
</tr>
</tbody>
</table>

### 3.4 Business incubation – a process view

The view of business incubation has moved from the traditional view of “incubator” as a space or facility to “incubation” as a process (Hallam & DeVora, 2009), which transcends the incubator (Hackett & Dilts, 2004). A process refers to a sequence of events or activities, which describe development over time (van de Ven, 1992). Business incubation is as a business support process that accelerates the successful development of start-ups by providing them a range of resources and services (e.g. hands-on management, access to finance, legal advice, operational know-how, access to new markets (Aernoudt, 2004)) developed or orchestrated by incubator management. These services are offered both in the BI and through its network (NBIA, 2014).
Hackett & Dilts (2004a) suggest a model of business incubation process, which can be measured by selection performance, monitoring and business assistance intensity and resource munificence. Moreover, the process is controlled by the population size, the state of the economy, incubator size, as well as the incubator level of development. Selection should be based on managerial, market, product and financial characteristics. By maintaining a certain level for admission, BIs create value when selecting teams with greater potential for success by helping contain the cost of potential entrepreneurial failure, enhancing the chances for weak, but promising firms’ success, as well as offering teams that are not selected the possibility reconsider their business model. Furthermore, monitoring and business assistance refers to how the incubator observers and helps incubatees with the development of their companies, and it can be characterized by time, comprehensiveness, and quality. According to Rice (2002), business assistance can be either reactive or proactive. In reactive mode, the entrepreneur is the initiator and requests help when needed from the BI. On the contrary, the incubator manager / employee can be proactive and engage in helping the incubatee on an episodic basis. Especially, if the incubatees and incubator work are in the same location, the latter approach is more naturally used. Last, resource munificence refers to the amount of incubator resources, which include, for instance, all assets, capabilities, organizational processes, and knowledge. The resources can be described by their availability, quality and utilization. (Hackett & Dilts, 2004a)

Other incubation process models use linked stages models of venture development where the venture moves from its inception to maturity. The models range from few to various stages. (Hannon, 2003) In this study the business incubation model is best described as a model with three stages (see Figure 7) due to aim of connecting network coordination to different stages, as well as because most of the case incubators utilize similar model in their activities. The first stage of incubation is pre-incubation, in which support for the potential entrepreneur is offered from assessment and development of the business idea to business model and business plan
development. In the next stage, the incubation stage, the entrepreneur is offered support from the start-up to the expansion phase. Generally this support includes access to finance, training, coaching, mentoring, networking and hosting services. Whereas, post-incubation phase is for companies that have reached their maturity phase and are almost ready to leave the incubator. Thus, in this stage services such as growth and internationalization support are offered. (Dichter, et al., 2010)

Figure 7 A simplified model of the business incubation process

3.5 Theoretical approaches explaining business incubation

Several theoretical frameworks offer insights into the concept of business incubation. The theoretical perspectives used so far in business incubation research are, e.g., structural contingency theory (Ketchen, et al., 1993; Hackett & Dilts, 2004), network theory (Hansen, et al., 2000; Lichtenstein, 1992), social capital theory (Hughes, et al., 2007; Scillitoe & Chakrabarti, 2009), stakeholder theory (Alsos, et al., 2011) and resourced-based view of the firm (Somsuk & Laosirihongthong, 2013). In the following chapters the basic assumptions of the theories relevant to this study are presented.

3.5.1 Network theory

Network theory suggests that the incubation process includes and transcends the incubator, rather than locating either inside the incubator or in the local community (Hackett & Dilts, 2004). Recent theoretical developments suggest that the likelihood of value creation increases when the incubator is structured as a strategic network (Hughes, et al., 2007).

During the last two decades a new incubator model “the networked incubator” has emerged. Hansen et al. (2000) employ network theory and
define a networked incubator as an incubator that exploits institutionalized networking, which leads to providing incubatees preferential access to potential partners and advisers. Thus, the incubator has mechanisms to foster partnerships among incubatees and other organizations, so that incubatees are able to meet and receive the full attention of busy people, for instance, to pitch a business proposal. Consequently, the flow of knowledge and talent across companies is facilitated and marketing and technology relationships as well as strategic partnerships are created between them. If the networked incubator is properly designed in addition to combining unique networking benefits, it can combine the scale and scope of large, established organizations and the entrepreneurial drive and spirit of small venture-capital companies. The advantages of networked incubators in comparison to established companies and venture capitalists are presented in Table 5.

Table 5 Advantages of networked Incubators (Hansen, et al., 2000)

<table>
<thead>
<tr>
<th></th>
<th>Established companies</th>
<th>Venture capitalists</th>
<th>Networked incubators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale and scope</strong></td>
<td><strong>High</strong></td>
<td><strong>Low</strong></td>
<td><strong>Medium</strong></td>
</tr>
<tr>
<td>Leveraging size and reach to</td>
<td>Historically the key</td>
<td>VC-backed start-ups</td>
<td>Common services and</td>
</tr>
<tr>
<td>lower costs by pooling</td>
<td>advantage of large</td>
<td>are left alone to</td>
<td>pooling of resources</td>
</tr>
<tr>
<td>resources and spreading them</td>
<td>global companies</td>
<td>obtain services and</td>
<td>ensure some benefits, e.g.</td>
</tr>
<tr>
<td>across units</td>
<td></td>
<td>buy supplies</td>
<td>time savings</td>
</tr>
<tr>
<td><strong>Entrepreneurial drive</strong></td>
<td><strong>Low</strong></td>
<td><strong>High</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>Stimulating individuals to</td>
<td>Red tape hinders new</td>
<td>Entrepreneurs are</td>
<td>Entrepreneurs are</td>
</tr>
<tr>
<td>pursue risky and disruptive</td>
<td>ventures; entrepreneurs</td>
<td>free to pursue</td>
<td>free of red tape and</td>
</tr>
<tr>
<td>innovations</td>
<td>not rewarded</td>
<td>ventures and own</td>
<td>own equity in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>equity stakes</td>
<td>ventures</td>
</tr>
<tr>
<td><strong>Network access</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Low</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>Forging partnerships,</td>
<td>Many established</td>
<td>A VC partner may</td>
<td>Organized and active</td>
</tr>
<tr>
<td>obtaining advice, and</td>
<td>companies have some,</td>
<td>have and excellent</td>
<td>networking among</td>
</tr>
<tr>
<td>recruiting people</td>
<td>but not extensive,</td>
<td>personal network but</td>
<td>portfolio companies</td>
</tr>
<tr>
<td></td>
<td>contacts with internet</td>
<td>it doesn’t go</td>
<td>and strategic partners</td>
</tr>
<tr>
<td></td>
<td>companies</td>
<td>beyond the individual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>partner</td>
<td></td>
</tr>
</tbody>
</table>

Hansen et al. (2000) identified two categories of organizational practices that support the success of business incubation: portfolio strategy and network design. Creating a portfolio of firms and advisers that incubatees can
leverage is important for a successful incubator. Therefore, these participants should be related to one another in order to gain from the benefits of synergy created by being connected to each other and sharing resources. Furthermore, network design, which includes the mechanisms that institutionalize networking, is extremely important as well. These mechanisms comprise of, e.g., creating formal links with external experts, bringing outside experts to the incubator space, scheduling occasional, yet regular meeting, establishing processes for exchanging knowledge, implementing economic incentives, and hiring specialized deal brokers. The objective is to create relationships that are connected more to the incubator than to specific individuals.

Hughes et al. (2007) argue that co-production of value by exploiting opportunities to collaborate is the reason behind business incubation’s existence. They also define business incubation from the network perspective “as the outcome of a network model of powerful business connection that enables value creation through firms establishing and exploiting interactive ties among incubating firms and networked firms”. The incubator network is referred to as a generic network comprising typically of the incubating firms, in-house service centers, on-site assistance organizations or outside firms brought in by the incubator’s management. The network is developed and made available to all of the incubatees by the management of a business incubator. The main objectives of networking are access to resources and acquisition of knowledge. Thereby incubatees can save time and costs by drawing on the already existent incubator network. Thus, they suggest that different combinations of networking activities, sharing and accessing resources, and knowledge acquisition through active involvement, generate different incubation outcomes. The results of the study implied that incubator management teams should be proactive in encouraging and maintaining interaction and collaboration among firms to get the best possible outcome from the incubation process.
A networked incubator can also be referred to as an incubator, where the new ventures themselves have developed and managed the incubator with a bottom-up approach (Bøllingtoft & Ulhøi, 2005; Bøllingtoft, 2012). This type of a networked incubator is based on territorial synergy, relational symbiosis, and economies of scope (Bøllingtoft & Ulhøi, 2005). In Bøllingtoft’s (2012) research of two self-generated “bottom-up business incubators” it is found that these incubators are characterized by being based on mutual recognition of the value of networking as well as cooperation among the firms. However, the bottom-up approach view of a networked incubator is not applicable to this study.

In his PhD dissertation Lichtenstein (1992) examined the significance of relationships in entrepreneurship basing his research on two business incubators. The research suggested that the opportunities that BIs offer for its incubatees to interact and develop relationships with other incubatees, incubator management and other actors connected to the incubator, is the most significant contribution of BIs to entrepreneurship. Moreover, nine factors that influence the interaction and development of relationships were identified: 1) type of businesses, 2) personal characteristics of the incubatee managers, 3) stage of the firms’ development, 4) existence of a critical mass of firms, 5) the incubator space, 6) norms and attitudes, 8) forums for discussion, and 9) the actions of the incubator manager.

Lastly, Aernoudt (2004) suggests that networking not only amongst incubatees, but also between incubatees and graduates is an important aspect of business incubation. Well managed incubators stay in contact with their alumni companies and encourage these companies to collaborate with current incubator residents. However, formal policies for alumni involvement are not that common among BIs. In addition, links between incubators are also important. They can be used as a platform to exchange experiences and as a basis for cooperation between incubatees and alumni from different incubators, especially if incubators are focused on specific sectors. (Aernoudt, 2004)
### 3.5.2 Social capital theory

Social capital is defined by Inkpen & Tsang (2005) as “the aggregate of resources embedded within, available through, and derived from the network of relationships possessed by an individual or organization”. Thus, it refers to the actual and potential resources that can be accessed through an actor’s network of relationships (Nahapiet & Ghoshal, 1998). Moreover, it is the goodwill available to individuals or groups originating from the structure and content of the actor’s social relations, which can be mobilized to achieve certain goals and it is a valuable resource (Adler & Kwon, 2002). Social capital can be seen to have many dimensions. Nahapiet & Goshal (1998) propose a model that explains social capital in three dimensions; structural, cognitive and relational (see Table 6).

<table>
<thead>
<tr>
<th>Structural</th>
<th>Cognitive</th>
<th>Relational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network ties</td>
<td>Shared language and codes</td>
<td>Trust</td>
</tr>
<tr>
<td>Network configuration</td>
<td>Shared narratives</td>
<td>Norms</td>
</tr>
<tr>
<td>Appropriable organization</td>
<td></td>
<td>Obligations and expectations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identification</td>
</tr>
</tbody>
</table>

Hughes et al. (2007) adopted a social capital perspective to study how an incubating firm can best create value through business incubation. They base their research on prior evidence, which suggests that developing social capital and actively seizing network opportunities can create competitive advantage. Social capital is generated when incubatees form strong relationships, which are strategically important and interactive, within the network, and, thereby, can create value and increase performance. Developing social capital is done by resource pooling activity and strategic network involvement. Resource pooling activity is based on the resource-based view of networking, and refers to the extent to which a firm is willing to pool and share its resources with others. Whereas, strategic network
involvement, which represent the knowledge-based view, is defined as the extent to which a firm interacts with other to access and acquire knowledge.

Scillitoe & Chakrabarti (2009) examined the incubation process of new technology-based ventures (NTBV) drawing also from the social capital perspective. The conceptual model developed based on their analysis, suggests that to access and gain social capital benefits through the incubator, first network activators of social capitals need to be in place. The activators comprise of the selection process of the incubator, of the motivation of the NTBV founding team, and of the abilities of the NTBV team. The selection process determines whether the team will get the possibility to access the network. If the team will be motivated, they will endorse resource exchange and learn by encouraging new social connection and an environment of open collaboration. Whereas the abilities is connected to size of the team, to their intellectual capital, and combinative capabilities. Thus more team members means more channels to access the network, more intellectual capital and combinative capabilities, which are needed capture the value from the network. Furthermore, once the activators are in place, the way of accessing the networks depends on the source of social capital and the sort of help needed. The means to create and access social capital are through historical connections, trust-based interactions, and facilitation by the incubator management. The team may use any of the ways depending on the type of social capital needed, technological or business, and where it can be best created.

Moreover, Aaboen (2009) suggests that the social input comes from the innovative environment inside the incubator. And, as the resources will be mobilized through the social network, the social input will give access to the similar resources as other inputs, but in a more indirect way. Therefore, incubatees should use networking activities to create beneficial relationships with other firms that may possess useful resources or knowledge. In addition, Tötterman & Sten (2005) studied business incubation and social capital basing their research on the idea that business incubators can support new
ventures in their development by giving them credibility, and by helping them to develop support and business networks.
4 NETWORK COORDINATION IN BUSINESS INCUBATION – THEORETICAL MODEL

Business incubation is a strategic, value-adding business support process, which includes and transcends the incubator. Moreover, it is the outcome of a network of business connections, which enables value creation through firms establishing and exploiting interactive ties among incubatees and networked organizations and individuals. The aim of business incubation is facilitating the successful new venture development. The process comprises three different stages: pre-incubation, incubation and post-incubation. The business incubation network is coordinated by the hub firm – business incubator. (Hackett & Dilts, 2004; Aernoudt, 2004; NBIA, 2014; Dichter, et al., 2010; Hughes, et al., 2007)

As the business incubator network has characteristics of both business renewal networks and innovation networks, it can be argued that network coordination in business incubation is multidimensional comprising both network management and network orchestration mechanisms. From the management perspective mechanisms that can be identified and relate to business incubation networks are selection, monitoring, setting goals and timetables, and creating organized structures for coordinated collaboration (Möller & Rajala, 2007; Ritala, et al., 2012). These mechanisms that institutionalize networking can be, e.g., creating formal links with external experts, bringing outside experts to the incubator space, scheduling occasional or regular meetings, establishing processes for exchanging knowledge, implementing economic incentives, and hiring specialized deal brokers. (Hansen, et al., 2000)

Network orchestration, which refers to enabling and facilitating the coordination of the network by subtly influencing other actors and creating the premises for knowledge exchange, value creation and capture, and innovation, comprises of mechanisms that enable knowledge mobility,
strengthen the common identity within the network and promote network stability. To achieve these, the hub firm needs to, for instance, create exchange forums and formal informal communication channels and communicate its vision. (Dhanaraj & Parkhe, 2006; Ritala, et al., 2009; Ritala, et al., 2012).

According to the previous literature on business incubation value deriving from the network to the incubatees is credibility, access to capital, networks of experts and partners, knowledge and know-how, resources, support systems, faster learning and solutions to problems. (Hackett & Dilts, 2004; Hansen, et al., 2000; Tötterman & Sten, 2005)

However, organizational practices and structures that support the process must be in place to be able to create value for the incubatees. Hansen et al. (2000) identified two categories of organizational practices that support the success of business incubation; portfolio strategy and network design. Creating a portfolio of firms and advisers that incubatees can leverage is important for a successful incubator. Therefore, these participants should be related to one another in order to gain from the benefits of synergy created by being connected to each other and sharing resources. Furthermore, network design, where relationships are connected more to the incubator than to specific individuals is important. (Hansen, et al., 2000). The business incubator is in fact a network of individuals and organizations, which includes various actors, such as the incubator management and staff, incubator advisory board, incubatees, local universities, industry contacts, and professional services providers (e.g. lawyers, accountants, consultants, marketing specialists, venture capitalists, angel investors, and volunteers). (Hackett & Dilts, 2004)

Thus, the theoretical model of the research has been formed on the basis of the synthesis of the scientific literature reviewed on the theoretical perspectives on network coordination in parallel with business incubation research. The model proposes coordination mechanisms used in the
business incubation process, and the value that is created through the network for the incubatees (see Figure 8).

Figure 8 Framework for network coordination in business incubation

Based on the aforementioned theoretical assumptions the coordination mechanisms of business incubators in relation to the business incubation process will be studied in more detail in the following empirical part of this study. In addition, factors inhibiting or restricting the coordination as well as factors that create value from the network are to be investigated. Moreover, as the business incubators are tied to their local communities, the similarities and/or differences of Finnish and Russian business incubators’ network coordination will be researched.
5 EMPIRICAL RESEARCH METHODOLOGY

In this chapter the methodology of the empirical part of this research is presented. First, the data collection is thoroughly explained followed by a detailed description of the data analysis method used in this study. Last, the quality of the research is discussed through reliability and validity questions.

5.1 Data collection

As mentioned in Chapter 1.3 the methodological choice of this research is mono method qualitative. Qualitative research seeks to understand phenomena in context-specific settings (Golafshani, 2003) and is defined as any kind of research that uses data or produces findings that are not quantifiable or statistical (Strauss & Corbin, 1990). Moreover, qualitative is used as a synonym for any data collection technique or data analysis procedure that produces or uses non-numerical data, that is based on meanings expressed through words and the results are collected in non-standardized data.

The primary data collection was carried out by means of interviews, which are dominant in the interpretive paradigm (Golafshani, 2003). Interviews were chosen as the data collection method because people are more willing to share their experiences in face-to-face meetings instead of writing something down. Moreover, with interviews it is possible to collect valid, reliable, rich and detailed set of data that are relevant to the research questions and objectives of the study. (Saunders, et al., 2009). In order to get as much insight as possible about the cases semi-structured interviews were considered as most appropriate for the research. In semi-structured interviews the researcher has a list of themes and questions to be covered, although they might vary from interview to interview (Saunders, et al., 2009). The topics during the interviews were designed to cover as much as possible regarding network coordination functions taking place within the business
incubators. The interview cover letter and guides are presented in Appendices 1, 2 and 3.

The selection of the cases was done based on their location and availability. Location selection for the study reflected research project budgetary and time limitations. To minimize costs and time, the incubators were chosen within 300 km from the researcher’s location. Requests participating in the research were sent to four incubators in Finland and four incubators in Russia. Thus, agreements to participate in the study were received from three Finnish and two Russian Incubators. However, only two from each country were included in the research data.

The interviews of overall 16 informants were carried out in March and April of 2014, of which 14 were chosen for to be studied. The chosen informants were directors and managers of the incubators \((n=5)\) and CEOs and/or founders of the incubating firms \((n=9)\). Information about the study participants is presented in Table 7. Incubator representatives were selected on the basis of the characteristics of their incubator, rather than on the characteristics of the individuals. Nevertheless, they were chosen as they are seen as “experts” on their incubators. The incubator representatives were asked to nominate three entrepreneurs to participate in the study. The nomination guidelines indicated that one from each incubation process stage was to be selected. If the incubator managers did not nominate entrepreneurs to participate in the study, the researcher contacted incubator residents without prior knowledge on their incubation phase.

The interviewees chose where the interview took place so that it would be conducted in an environment that was comfortable for them. The language of the interviews was chosen by the interviewee: Finnish, English or Russian. The interviews were audio-recorded, after having received permission to do so. The duration varied a bit depending on how talkative the interviewee was but mainly the interviews with business incubator representatives were approximately 60 minutes and with business incubatee representatives
approximately 30 minutes. In total 11 hours of interviews were recorded, and subsequently transcribed. Additional data were gathered from public sources such as incubator and company websites.

Table 7 Respondent information

<table>
<thead>
<tr>
<th>Interview Identifier</th>
<th>Country</th>
<th>Business incubator / Company</th>
<th>Position</th>
<th>Source of idea / team</th>
<th>Entry to BI</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Finland</td>
<td>Joensu Science Park</td>
<td>Development manager</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>Finland</td>
<td>Joensu Science Park</td>
<td>CEO / Founder</td>
<td>Universities &amp; Polytechnics</td>
<td>2012</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Finland</td>
<td>Joensu Science Park</td>
<td>CEO / Co-founder</td>
<td>Universities &amp; Polytechnics</td>
<td>2012</td>
<td>5</td>
</tr>
<tr>
<td>D</td>
<td>Finland</td>
<td>Joensu Science Park</td>
<td>CEO</td>
<td>Business community</td>
<td>2012</td>
<td>7</td>
</tr>
<tr>
<td>E &amp; F</td>
<td>Finland</td>
<td>Spinno</td>
<td>Director / Project Manager</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>G &amp; H</td>
<td>Finland</td>
<td>Spinno</td>
<td>Founder</td>
<td>Universities &amp; Polytechnics</td>
<td>2013</td>
<td>2</td>
</tr>
<tr>
<td>I</td>
<td>Finland</td>
<td>Spinno</td>
<td>CEO</td>
<td>Business community</td>
<td>2013</td>
<td>4</td>
</tr>
<tr>
<td>J</td>
<td>Russia</td>
<td>Ingria</td>
<td>Director</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>K</td>
<td>Russia</td>
<td>Ingria</td>
<td>CEO</td>
<td>Universities &amp; Polytechnics</td>
<td>2011</td>
<td>10</td>
</tr>
<tr>
<td>L</td>
<td>Russia</td>
<td>Ingria</td>
<td>CEO</td>
<td>Business community</td>
<td>2013</td>
<td>30</td>
</tr>
<tr>
<td>M</td>
<td>Russia</td>
<td>Ingria</td>
<td>CEO</td>
<td>Business community</td>
<td>2012</td>
<td>6-7</td>
</tr>
<tr>
<td>N</td>
<td>Russia</td>
<td>Polytechnic</td>
<td>Director (Technopark Polytechnic)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

5.2 Data analysis

Qualitative content analysis is the basic analysis method that forms the base for all qualitative studies. Content analysis is a method for analyzing written document, such as books, articles, letters interviews, speeches and
discussion. Therefore, the material needs to be in written form, so for example interviews need to be transcribed before they can be analyzed. The aim of the method is to get a summarized and general description of the researched issue. This organized data is thereby ready for drawing conclusions. (Tuomi & Sarajärvi, 2009)

After the interviews, the audio-data was transcribed and analyzed using qualitative abductive content analysis. Qualitative analyses are usually divided into inductive and deductive approaches. Inductive analysis aims at creating broad generalizations and theory from the research data. Deductive analysis is guided by existing theories or scientific information. Moreover, abductive analysis is located in between of inductive and deductive approaches. In abductive analysis method the analyzed themes or categories are derived from the data, however prior research and theories may be used as help or guidance in the latter stages of the analysis. (Tuomi & Sarajärvi, 2009) The abductive approach was chosen so that the research will relate to previous scientific discussion, but not too strictly, so that space for the occurrence of new findings is left as well.

The content analysis process was as follows (adapted from Tuomi & Sarajärvi, 2009):

1. Listening to the interviews and transcribing
2. Reading the interviews and familiarizing to the content
3. Defining the units of analysis based on the data and theoretical framework
4. Coding the data under relevant nodes
5. Grouping the nodes into categories
6. Uniting categories to themes

The data analysis was started by listening to interviews and transcribing them from word to word. After transcribing the data, the data was listened to again in parallel with reading the transcribed text in order to make sure that the
transcribed and recorded data were consistent. Next, the empirical data were coded by using computer assisted qualitative data analysis software, NVivo. The transcribed data was uploaded to the software, and coded by using nodes, which partly arose from the data themselves and was partly based on the theoretical framework. The software allowed easier management of the data in comparison to manual techniques, or other software, such as Microsoft Word, which is not designed for data analysis purposes. Further, the nodes were grouped into categories, and categories were thereafter united into themes.

5.3 Reliability & validity

In all research the aim is to avoid mistakes, therefore the quality of the research should be evaluated in every separate study (Tuomi & Sarajärvi, 2009). Reliability and validity are issues which any qualitative researches should take into account while designing a study, analysing results and evaluating the quality of the research (Patton, 2002). In next chapters, the reliability and validity of this study are discussed.

Reliability of the study can be proved by demonstrating that the operations of the research, such as the data collection and analysis procedures, can be repeated over and over again (Yin, 2009). In order to strengthen the reliability of the study the procedures of the study are documented in detail, so that they can be repeated.

According to Yin (2009), the validity of a case study should be assessed. The basic validity question is whether the research actually measures what it intended to measure. However, this does not apply to qualitative research as their purpose is not to measure anything, but rather to generate understanding. Thus, the validity of the data in qualitative research depends on the purpose of the study. When the purpose is generating understanding of a social phenomenon good validity is created if the informant is part of the phenomenon and he/she is given the opportunity to freely talk about it, i.e. by choosing the informants well and using non-forcing interview method.
(Stenbacka, 2001) The empirical data gathering focused on informal interview settings and in-depth discussion with informants who were clearly part of the phenomenon and experts in their businesses. The interviewees were encouraged to share their own thoughts and experiences on the research issue without restricting the scope of interview by tightly structured interviews. Still, the subjectivity of the researcher and the informants may lead to a lack of rigor.

Moreover, external validity refers to the extent to which the study’s findings can be generalized. (Yin, 2009) The limitations concerning external validity of this research lie in its explorative, case-based approach, which limit the generalizability of the results. Although, multiple-case studies can be more robust than a single case study and, thereby depending on the results, strengthen the external validity. Further, as the study is conducted only in Finland and Russia, the results of the study cannot be directly applied to other contexts due to the various differences, such as countries development stages, culture and innovation systems.
6 CASE ENVIRONMENTS & STUDIES

In accordance with previous research, business incubation is moderated by the state of the economy (Hackett & Dilts, 2004a), country specific institutional factors, such as government policy, investment decisions, as well as by the relevant innovation systems (Freeman, 1987; Lundvall, 2007). BIs can be viewed as parts of innovative infrastructures. Infrastructure itself is part of the supportive environment upon which national innovation systems are based on. This infrastructure comprises of physical infrastructure, financial support, service and competence infrastructure and information systems. (Ministry of Economic Development of the Russian Federation, 2013) In the following chapter the highlights of the Finnish and Russian innovation systems are presented and research case studies are introduced.

6.1 Finnish innovation system

The Finnish economy is innovation driven. In 2012 the population of Finland was 5.4 million, and the Gross Domestic Product (GDP) was 250.1 US$ billions, which is 46,098 per capita. (World Economic Forum, 2013) Throughout the 2000s Finland has ranked high in global comparisons related to competitiveness and innovation (e.g. Global Innovation Index (Cornell University, et al., 2013)). In the overall index of the Global Competitiveness Report 2013-2014 Finland ranks third (out of 148), and first in terms of innovation. (World Economic Forum, 2013) One reason for such success is the active and successful dialogue between companies, research institutes and the public sector (OECD, 2012).

The development of the Finnish innovation systems is coordinated an expert body, the Research and Innovation Council (Tekes, 2014). Moreover, the Ministry of Employment and Economy (MEE) is responsible for innovation policy planning and budgeting and the Ministry of Education and Culture (MEC) is responsible for higher education and science policy related matters (OECD, 2012).
According to the latest OECD Science, Technology and Industry (STI) Outlook (OECD, 2012), which reviews the key trends in STI policies and performance in OECD countries and major emerging economies, Finland’s STI system has been highly ranked for the past two decades. Finland has an open economy, and its businesses are well connected internationally, although its research system is mainly domestic. Industry and science are strongly linked, and a lot of public research is funded by industry. However, the rate of patents by universities and public research institutions is well below the OECD median. The gross domestic expenditure on R&D (GERD) was 3.88% in 2010, and thereby ranked second in the OECD area. Moreover, the Business Enterprise Expenditure on R&D (BERD) was at 2.70% of GDP in 2010, which was well above the OECD median.

Almost 80% of governmental R&D funding is channeled through MEE and MEC. There are two governmental agencies, which distribute research funding in Finland: Tekes, The Finnish Funding Agency for Technology and Innovation, and The Academy of Finland. Tekes is the main government financing and expert organizations for R&D and innovation activities in Finland. Tekes finances projects in companies, research institutes, universities as well as in the public sector. (Tekes, 2014) The main concentrations of the Academy of Finland are in advancing professional research training and careers, internationalization, and the application of research results (Academy of Finland, 2014).

Another Finnish development agency funded by the government is Sitra, the Finnish innovation Fund, which is an independent public fund reporting directly to the Finnish Parliament. Sitra focuses aims at sustainable development and well-being by organizing practical experiments, forming cross-boundary networks, and developing and financing business operations. (Sitra, 2014) In addition, Finnvera is specialized financing company governed by the State of Finland. Finnvera provides financing for the start, growth and internationalization of companies and guarantees against risks arising from
exports by offering loans, guarantees, venture capital investments, and export credit guarantees to its clients. (Finnvera, 2014)

The most problematic factors for doing business in Finland seen by business executives are restrictive labor regulations, tax rates and regulations, access to financing, as well as inefficient government bureaucracy. (World Economic Forum, 2013)

According to OECD (2012) currently an overall policy shift towards SMEs is taking place Finland. The Finnish Funding Agency for Technology and Innovation (Tekes) has been changing its focus from industrial and technological R&D-based projects to services firms, non-technical innovation and SMEs. Moreover, entrepreneurship is gaining popularity in Finland. There exists a robust venture capital industry as well as a lot of young patenting companies. In fact, within a small timeframe an internationally significant an rapidly growing ecosystem of young growth companies has emerged with the help of regional and national development platforms, such as the Vigo accelerator program (MEC & MEE, 2012), which has raised USD 80 million of capital to start-ups in clean technology, ICT, mobile and life sciences. The Vigo accelerators originate from a policy initiative from 2007 to create the Incubator 2.0 program to transform the Finnish business development services. The program outlined that critical for the new generation incubators is venture capitalists involvement, as well involvement of selected players from the academia and research community. (Ruohonen, 2007) Already in 2009 six incubators were launched operating with the new model (Autio, et al., 2013). An online advisory service, Enterprise Finland, for SMEs has been developed as well. (OECD, 2012) The Vigo accelerator program together with other programs have been able to combine innovative business ideas, the knowledge of experienced business coaches and public funding incentives in a way that generates added value (MEC & MEE, 2012).

Another initiative is the Innovative Cities (INKA) program in the most significant urban regions of Finland aims at creating internationally attractive
innovation clusters to Finland, and thereby, strengthening the Finnish innovation system. (MEC & MEE, 2012)

Overall, the most important issues that should be addressed and developed in Finland, from the science, technology and industry perspective, are internationalizing education, research and innovation, reforming public research institutes, broadening the scope of R&D and creating new growth enterprises in all sectors focusing on SMEs, and addressing green growth through radical system changes (OECD, 2012).

### 6.1.1 Joensuu Science Park Business Incubator

Joensuu Science Park business incubator was established in 2000. The incubator is part of Joensuu Science Park Ltd and is located on the same premises with the science park in Joensuu, Finland. The incubator’s main target is creating new business. (Joensuu Science Park Ltd, 2014) In addition, the incubator activity is linked with the growth strategy of the city of Joensuu. (Ruohio, 2014)

The business incubation process at Joensuu Science Park is divided into three phases: assessment, pre-incubator and incubator (see Figure 9). In the first phase the business idea and its maturity are examined in detail, and a business model is produced to determine whether the idea has business potential or not. In the next stage the business is simulated. A business plan is formulated, and if it indicates that there is potential for profitable business, a company is established, and the company can move on to incubator phase. In the incubator phase the company is sparred, provided with trainings and assistance in marketing, sales, corporate finances and financing, administration and other relevant issues. During all of the phases the teams have the possibility to use the incubator premises free of charge. The pre-incubator phase usually lasts for approximately six months, and the incubator phase lasts one to three years. (Joensuu Science Park Ltd, 2014)
Currently Joensuu Science Park business incubator has 50 customers in the assessment stage, 17 pre-incubatees and 18 incubatees. The incubator has three employees. (Ruohio, 2014).

### 6.1.2 Spinno Enterprise Center

Spinno Enterprise Center (Spinno) has a long history. It was originally established already in 1986 under a different name, and since that it has faced many changes and has been operating under various titles. In its current form it has been working in Espoo, Finland since 2010. The non-profit incubator is hosted by Laurea University of Applied Sciences, and it is located in Innopoli in Otaniemi, Finland. Spinno’s mission is to identify most promising business ideas in the Helsinki region. It offers a common innovation platform for the region’s business as well as academic and research institutions. The funding of Spinno comes from the regional Centre for Economic Development, Transport and the Environment, the City of Espoo, its customers and other key stakeholders. (Spinno Enterprise Center, 2014)

Spinno Enterprise Centers offers different stage incubation programs for technology and knowledge based start-ups. The business incubation process at Spinno is divided into three phases: pre-incubation, incubation and post-incubation, as presented in figure 10. In the first phase the incubator offers help in developing the company’s business idea, sparring and assistance in business plan development, company presentation preparation and financing planning. In the next stage, incubation, companies who seek rapid growth are supported by helping them to manage the risks associated with the commercialization process. The program offers sparring and assistance in starting up a business, assistance in planning and organizing financing. In
both of the first two stages the companies are offered participation in training and networking events. Moreover, a contact person for consulting and advice is appointed to each start-up. Last, the post-incubation program is dedicated to the support of start-up growth. The program provides sparring, advice, help in the initiation of in internationalization (e.g. via contacts) and participations in all of the incubator events. (Spinno Enterprise Center, 2014)

Figure 10 Spinno business incubation process

Currently Spinno has approximately 50 to 60 incubatees per year, and about 50 teams graduate the incubator each year. Currently the incubator employs two people, of which the current director, Tuomas Maisala, has been working in the incubator since 2001. (Maisala, 2014)

### 6.2 Russian innovation system

The Russian economy is in transition moving towards to an innovation driven economy. In 2012 the population of Russia was 143 million, and GDP was 2022 US$ billions, which is 14,247 per capita. (World Economic Forum, 2013) Russia ranks 64th (out of 148) in the overall index of the Global Competitiveness Report 2013-2014, improving its ranking by three positions from previous year. In terms of innovation, Russia shows a lack of capacity as it is placed on the 78th position. (World Economic Forum, 2013)

Russia has traditionally been strong in science and education. Its public science foundation is large and dominated by state-owned industrial branch institutes, in which a lot of R&D is still conducted. Moreover, Russia is known internationally for its main science and technology spheres, such as aerospace, nuclear science, engineering, as well as advanced software. The share of public research which is funded by industry is slightly above the OECD median. However, the relative amount of patents coming from
universities and public labs is very low. In 2010 GERD was 1.16%, which is significantly below the OECD median. Moreover, business sector funded 26% and government funded 70% of GERD. (OECD, 2012)

In Russia several ministries are responsible for the support of R&D and innovation development, mainly the Ministry of Education and Science and the Ministry of Economic Development. In addition, the government’s High Technology and Innovation Commission, and the President’s Commission for Modernization and Technological Development of Russia’s Economy have a growing impact on the R&D innovation policies. (OECD, 2012) Furthermore, in 2012 the Council for Economic Modernization and Innovative Development was established under the President of the Russian Federation to facilitate economic modernization and innovative development in Russia (Council for Economic Modernisation and Innovative Development, 2012).

After the financial crisis in 2008 a new strategic approach to Russia's modernization emerged, and the focus shifted to long-term objectives in the national STI system, as well as to a new way for governing it. Currently policy for fostering innovation is concentrating on various issues. First, the aim is to relieve administrative barriers and to improve framework conditions, including legislation and taxation, to enable innovation. Second, major state-owned enterprises are pushed to develop and execute innovation development strategies. Moreover, the new strategy is summarized in the Ministry of Economic Development’s Innovation Development Strategy of the Russian Federation to 2020. The main objectives of this strategy are the development of human capital, stimulation of innovation activities in business sector, creating a favorable climate for innovation in the public sector, increasing the efficiency and dynamism of R&D, and promoting international cooperation. (OECD, 2012).

A lot has been done already to improve the conditions for innovation. For instance, a system of development institutions (e.g. RUSNANO, the Fund for Facilitating Small Business Development in Science and Technology) has
been set up to support innovation by covering the entire investment cycle and raising capital for innovative projects at every level, including startups. In addition, in 2012 supportive infrastructure in the form of 115 technology transfer centers and 177 business incubators had been established. (Council for Economic Modernisation and Innovative Development, 2012)

In Russia R&D and innovation activities are mainly concentrated in specific geographical areas, in and around Moscow and St. Petersburg. Also, the Russian government promotes regional cluster development, such as special economic zones, technoparks, and innovation and technology centers. (OECD, 2012) In fact, 25 innovative clusters around Russia have been selected to receive state support for conducting development programs (Council for Economic Modernisation and Innovative Development, 2012). One example of an innovation cluster in Russia is Skolkovo Innovation City which was established in 2010. (OECD, 2012)

Currently the major barriers to entrepreneurship in Russia are its overly restrictive regulation, exceptions to the rule of law, and a lack of competition. At the same the R&D capabilities are threatened by researchers’ and engineers’ ageing. (OECD, 2012) Furthermore, the most problematic factors for doing business in Russia seen by business executives are corruption, tax rates and regulations, inefficient government bureaucracy and access to financing. (World Economic Forum, 2013)

Overall, the most topical issues that should be addressed and developed in Russia, from the science, technology and industry perspective, are increasing companies’ innovation activities, strengthening universities’ research activities, better exploiting the commercial potential of public-sector R&D, and improving the framework conditions for entrepreneurship and innovation. (OECD, 2012)
6.2.1 Business Incubator Ingria

Business incubator Ingria was established in 2008 by the Government of St. Petersburg in St. Petersburg, Russia as a part of Technopark Ingria to support and develop technologically oriented small businesses. The incubator offers support in all business areas to start-ups in their early phases as well as to more mature projects in attracting investment, business scaling, team building and internationalization. In addition, Ingria supports technology projects, which usually come from universities or polytechnics, in patenting and intellectual property protection, developing business models and accessing large customers and capital. (St. Petersburg Technopark OJSC, 2014) Thus, Ingria is not only a place for accelerated development of innovative projects, but also serves the entire innovative infrastructure of the region. (Ingria, 2014)

The incubation process in Ingria is not predefined as in previous cases, although it is limited to a timeframe of 39 months. According to the director of Ingria (Rozhdestvenskiy, 2014) the reason of not using a staged process is the non-linear nature of innovation. However, to become a resident in the incubator projects need to meet certain criteria and pass assessment; the project needs to be identified as innovative and technological. Ingria does not select ventures from retail, alcohol, tobacco, and military industries. In incubation Ingria offers support attracting investments, marketing, collaboration with mentors, and HR. In addition, Ingria offers its incubatees workspace for rent, the possibility to conduct and attend various events and trainings, and get access to the employees know-how. Moreover, Ingria is developing its international cooperation. (St. Petersburg Technopark OJSC, 2014)

Typically Ingria has approximately 80 incubatees per year, and 100 teams graduate the incubator yearly. Currently the incubator employs 11 people including the current director Igor Rozhdestvenskiy. (Rozhdestvenskiy, 2014) The most important actors in Ingria’s network are incubator staff, incubatees,
mentors, investors, universities and polytechnics, technoparks and other incubators, the state and business community. (Ingria, 2014)

6.2.2 Business incubator Polytechnic

The business incubator Polytechnic was established in 2011. It operates under the St. Petersburg State Polytechnical University. The main goal of the incubator Polytechnic is to contribute to the development of the St. Petersburg State Polytechnical University's students' business ideas into viable businesses ready to enter the markets or Technopark Polytechnic. The main industries that the incubator focuses are related to the university; mechanical engineering, energy and medicine. (Salkutsan, 2014) The incubator offers its incubatees practical help, expert consultations, attendance in trainings and events, coworking space, partners, clients and team members for projects, and access to financing. The student technology center Fablab Polytech is part of the incubator. (Techopark Polytechnic, 2014)

The business incubator Polytechnic formally divides its incubation process into different stages. However, due to the fact that the incubator is fairly young and took in first projects less than a year ago, the process is not yet followed. Currently the incubator has approximately 10 projects and 4 employees. (Salkutsan, 2014)
7 ANALYSES & RESULTS

In this chapter the empirical findings of this research are discussed and explained in detail. First, the business incubator network design is explored. Further the network coordination mechanisms are investigated in parallel with the business incubation process. In addition the challenges in and value that is created for the incubatees are addressed. Last, the comparison between Finnish and Russian incubators is conducted. Part of the quotations of the interviews have been translated into English by the researcher as some of the interviews were originally conducted and transcribed in Finnish and in Russian. Yet, special emphasis has been put to capture the substance of the original data to avoid possible biases.

7.1 Business incubator network design

The first step in analyzing the coordination of the business incubators’ networks was to identify the central characteristics and the structure of the networks.

The business incubator network design can be divided into internal and external networks. The internal incubator network comprises of the incubator management and incubatees, while various other actors form the external network. First, an integral part of the incubation network are the sources of business ideas and teams, which are mainly business community, universities and polytechnics, research institutes and other organizations, e.g. enterprise agencies. Half of the respondents came from universities and polytechnics, and the other half from business life. Moreover these actors were connected to the business incubators’ other operations as well. According to the data other relevant network actors were professional service providers, external experts, financers and investors (including public financing organizations), mentors, alumni, media, other incubators & accelerators and other organizations.
When investigated from the value system network perspective by Möller & Rajala (2007) it seemed that the incubator networks principally had established value systems and were relatively well determined. Thus, the value activities and capabilities of the networks were mainly known and made explicit. Although one of the incubators had not been in operation for a long time, therefore its value system was yet less developed. From the perspective of a customer, incubatee, the main goal of these networks was business creation and development; turning business ideas into viable businesses. However, the secondary aim was local innovation activity development, which is not only beneficial for the incubatee, but in the interest of local communities. Therefore, the previous assumption on defining business incubator networks as business renewal networks seems to be accurate.

Moreover, business incubator networks seem to have some characteristics of innovation networks as well. First, the hub firm in the business incubation can be easily distinguished. The hub firm managing and orchestrating the network is the business incubator. Second, all of the business incubators that participated in the study were interested in commercialization of their incubatees' innovations. The incubators were not designed to develop traditional business; rather they focused mainly on technology and innovation. Therefore, their aim was also to produce new and modified value for the actors in the network. Taking into consideration these characteristics of the networks it is justified to apply the theoretical assumptions on network coordination to the data of this study.

7.2 Network coordination mechanisms in business incubation

7.2.1 Management mechanisms

The network management mechanisms in business incubation consist of selection, setting goals and monitoring, and mediation. The mechanisms will be explained in detail in the following chapters.
**Selection**

Supporting the previous research (Bergek & Norrman, 2008) the empirical data highlights the importance of the selection process as a management mechanism. In order to create and maintain a good network of incubatees, incubators need to be able to identify the ideas that are promising from the ones that need some other organization’s help or from the ones that simply cannot be helped. Moreover, as Scillitoe & Chakrabarti (2009) suggest, selection is one of the activators through which the team gets the opportunity to access the network, and social capital. The selection criteria and the strictness with what they are applied tends to vary among the incubators. The selection criteria vary across cases, and both entrepreneur-focused and idea-focused approaches are applied in the case incubators.

*In business idea assessment we try to identify quickly if it is our case or not. It takes about 8 minutes to know if it belongs to us or not. (Interviewee A)*

*For pre-incubation we have a meeting with 1 or 2 persons and the entrepreneur, interview, background check, LinkedIn-profile, googling keywords what can be found with the name of the company. We don’t use outside experts in it, so we make the decision ourselves. (Interviewee E)*

*Once the company is in [the incubator], once it has passed the unanimous decision with board of experts - -. (Interviewee J)*

However, the strictness of the selection process was different in the case countries. The Russian incubators were more flexible in the selection, and used more of the survival-of-the-fittest approach in comparison to their Finnish counterparts, which focused more on to picking the most potentially successful ventures.

*Out of these 10 projects we could have picked only two and work with them. - - We are practically ready to take any in any kind of idea. (Interviewee N)*

*Once a week our clients pitch to see who gets into the incubator and who doesn’t. Currently the situation is so that not all get in. (Interviewee A)*
Hackett & Dilts (2004a) suggest BIs create value when selecting teams with greater potential for success by helping contain the cost of potential entrepreneurial failure, enhancing the chances for weak, but promising firms’ success, as well as offering teams that are not selected the possibility reconsider their business model. However, this view does not consider the possibility that the business model might be good, but the appropriate help might be found from another organization. In accordance with the empirical evidence, business incubators, accelerators and other actors dealing with entrepreneurs tend to collaborate and moreover, intend to collaborate even more in the future. Already now incubators inform their applicants as well as their incubatees of other options as well. The correct directing of an applicant to an organization which suits the entrepreneur the best is important, for instance, from the perspective of economy in terms of job creation.

*If it [applicant] has a team and it wants to grow, it gets directed to us. If it wants to establish a flower store, then we direct it to organization X. If it wants to expand its operations to Russia, it gets directed to another place.* (Interviewee A)

The abilities of the incubatees including intellectual capital and combinative capabilities are needed to understand and create value from network gains (Scillitoe & Chakrabarti, 2009). It was evident that the skills and capabilities of the incubatees were diverse. Those teams that came from business life often had more experience, and thereby more abilities compared to teams of young entrepreneurs or researchers coming from universities and polytechnics.

*We have projects that come from the business side, which have really good abilities or understanding on how they should approach investors. So for them it is enough that I do an e-mail introduction. – Now I have two students, who are graduating or have just graduated, so I go along with them to the meeting with the same investor, because they have never in their life tried to sell their company to an investor. So it is not enough to make an introduction, but we sort of need to prepare for the meeting.* (Interviewee E)
“All of the founders have experience. We have been working for long in different places, in big companies -- we all can make products and do business. None of us has had a start-up company. (Interviewee I)

“The fact is that earlier all my colleagues were mostly researchers, so I couldn’t consult with them on these topics [related to business]. (Interviewee K)

In relation to the business incubation process selection naturally takes place in the beginning of the process.

**Setting goals & monitoring**

According to the analyzed data setting goals and monitoring performance and development is one of the management activities of the incubator. By setting goals and objectives both the incubatees and incubators have a clear vision on where the company is going. In addition, the set goals act as a base for monitoring activity. The monitoring processes varied greatly among the cases. In the cases of Finnish business incubators, the staged incubation process acted as an objective setting framework, and as a monitoring mechanism through which the BI was able to keep track of their incubatees’ development.

*The stages [of business incubation process] are more like a program, so we can see that the projects go forward, and checkpoints where we make decisions on with which projects we continue forward.* (Interviewee E)

*When the pre-incubation stage start we make a project plan; where we will be after the pre-incubation stage and where we will be after the incubation stage, and then we chop it to pieces, to milestones.* (Interviewee A)

*If somebody doesn’t do their homework or be motivated to do anything, we give a yellow card. And, if nothing still happens we give a red card. And, then you need to leave.* (Interviewee A)

Whereas, in the Russian cases the incubators did not use a staged process, and thereby monitoring appeared to be looser. However, monitoring is was also done informally. In addition to clear monitoring practices, in all of the
cases monitoring was also dependent on the incubatee activity. Thus, if the incubatee regularly contacted the incubator and asked for support and advice, it was received.

Typically what happens once the company is in, once it has passed the unanimous decision with board of experts, there is a launching meeting, where the account manager identifies the needs of the company. What is the need: is it money, is it organizational help, is it education, what is it? And, depending on this we either hook them up with - -. The total time which the project can sit here is 39 months. So, basically not many projects really need it, because they grow, and if they don’t grow, I don’t know why we would keep them here. (Interviewee J)

In relation to the business incubation process setting goals and monitoring is mainly executed in the points where stages change. However, according to the data both of them may take place during specific stages as well. Therefore, it can be concluded that setting goals and monitoring applies to the whole incubation process.

Mediation

An integral part in the network coordination of business incubators is mediation. The business incubator acts as a mediator between various actors and the incubatees by making introductions and referrals between them. In fact, the main motivation for some of the incubatees to join the incubator was in fact the connections that the incubator would offer. Through mediation incubatees get preferential access to various networks of experts. And, vice versa other actors may be motivated to join the network to get access to incubatees as clients, investments targets and so on. Incubatees find especially valuable introductions and referrals to investors and other financers. In all of the cases the help from incubators in receiving public grants was considered as very important. In the case of the aforementioned actors, the value created for the incubatees is access to capital.

This is the main thing [financers] to which we try to connect entrepreneurs. We make introductions and try to help them to get financing from these sources. (Interviewee E)
When innovative business is growing, they fight for capitalization. They don’t need revenues in this stage. (Interviewee J)

We were told that we should go to an incubator, because we can get more contacts and connections through them, so that’s what we did. - - So far it’s been setting up with investors, which I appreciate a lot. (Interviewee C)

Ingria has organized some one-to-one meetings with different investment funds, and they often invite us to these meetings to get introduced to them to find out if this fund is interested in our products. (Interviewee L)

In addition to financers, business incubator connects incubatees with each other, and with other actors from their networks, such as potential customers, partners, employees and mentors. Mediation is one way for giving incubatees access to knowledge and know-how.

We do connecting a lot. For instance, company X’s guys said that they are very dependent on their subcontractor in Helsinki and asked us for any tips. I said that go ahead and buy a part of company Y [incubatee in the same incubator]. - - Then they made a deal, and now they own a part of that company. (Interviewee A)

We do a lot of introductions from our own contacts. Basically they are private people, who can help when start-ups who need different kinds of advice. (Interviewee E)

In Finnish incubators one of the problems is that many incubators are project based. The risk with project based incubation is that if the new project does not for some reason get financing, they will lose their employees, i.e. mediators.

That is the risk in this project based incubation. There will be inflation in the knowhow at some point if we don't get funding for some reason. Then the guys just go to work at better places. (Interviewee A)
In relation to the business incubation process financing is especially important in the incubation stage. However, mediation with other actors is conducted throughout the process.

In the previous research of Bergek & Norrman (2008) mediation refers to the incubators role to act as an intermediary between incubatees and innovation systems. In their research network mediation refers to incubator matching incubatees with other actors with the objective of filling gaps in incubatees’ established networks. However, this research makes a distinction between mediation as aforementioned direct actions (introductions, referrals) versus mediation as creating the premises for possible networking. The latter is discussed in the following chapter under enabling knowledge mobility.

### 7.2.2 Orchestration mechanisms

The network orchestration mechanisms in business incubation consist of activation, enabling knowledge mobility, maintaining network stability and managing innovation appropriability. The mechanisms will be explained in detail in the following chapters.

**Activation**

The study reveals that activation constitutes as one of the network orchestration mechanisms in business coordination, although it has received little attention in the business incubation literature. Incubators have identified the need to select the actors with the necessary resources to motivate them to participate. Therefore, the incubator employees give lectures and presentations in various organizations, mainly in universities and polytechnics, but also at other events of various organizations. This can be seen as an orchestrating mechanism which aims at activating people to become interested in entrepreneurship and apply to incubators as they get knowledge on the possibilities that incubators offer. In addition, to applicants, incubators activate other actors as well in order to grow their resource base.

*We have continuously different events [at the university] in which we show what we do with various open educational programs*
and we invite people who have built their own business to show how they did it. – We try to show that it is interesting and worthwhile and financially viable. (Interviewee N)

I joined the incubator because it was in Joensuu. And, of course these guys, -- I think also before they had few times some presentations in the university. (Interviewee B)

Activation is basically not related to the business incubation process as such. The process can be viewed as a process for a project – incubatee. However, the incubator needs to consider other stakeholders in its operations, and it can be argued that another customer for incubator is the local / national economy as the incubator has the potential to create jobs, revitalize cities and regions, commercialize new technologies, and thereby strengthen local and national economies. Thereby, from the view of the customer, incubatee, activation has happened before the incubation process starts. Nevertheless, from the incubator’s perspective activation is an ongoing orchestration mechanism to motivate actors to participate.

Enabling knowledge mobility

The empirical material shows that an important aspect of business incubation is managing knowledge mobility. One of the ways of promoting knowledge mobility in networks is socialization, i.e. formal and informal linkages among network members (Dhanaraj & Parkhe, 2006). Socialization on the other hand can be can be enhanced by strengthening social capital through, e.g., exchange forums and formal and informal communication channels. Social capital is generated in business incubation in various ways. First, it is generated when incubatees form strong relationships, which are strategically important and interactive, within the network. In all of the cases the incubator creates premises for interaction between the incubatees. This is mainly done by offering coworking spaces and by organizing joint events and trainings, where incubatees can share ideas, discuss and support each other. These interactions sometimes lead to business cooperation as well.

Synergies might be created there [trainings] directly. Or then they [incubatees] discuss during the breaks. (Interviewee F)
One more option from Ingria is networking. We meet interesting technology startups, who are also residents of Ingria and we can collaborate with them - - I tend to think that all partners or contacts within Ingria I have found on a coffee break in Ingria. (Interviewee M)

Yes, we have gotten something from there [incubator’s events]. Meeting there might result to all sorts of ideas and thoughts. Usually when people with similar mindsets come together and they are actively encouraged to talk, it always results in some sort of thoughts, ideas and cooperation. (Interviewee D)

Well at one event of Ingria I talked to a person, who was working in another startup. He became so interested in our development, that now he is my partner. (Interviewee K)

We were on one [business] mission, and we listened to their presentation, and they listened to ours, and then we went to a bar together, and decided that we can collaborate. (Interviewee L)

Although in one of the cases the incubator itself did not have a coworking space but instead they offered a cloud based service for incubatees to network with each other.

As Hansen et al. (2000) identified creating a portfolio of firms and advisers that incubators can leverage is important for successful a successful incubator. The actors should be related to one another to gain from the benefits of synergy created by being connected to each other and sharing resources. Although synergies are already created, but still all of the incubators identified as their weakness the fact that they did not have a specific sector focus, and some of the incubatees wished upon more focus, e.g. by organizing events for only certain types of businesses. Moreover, the lack of connections to customers might be in relation to the lack of focus.

At this point we don’t have a specific focus. It is sort of a weakness for us. However, in the future we will have a focus. (Interviewee A)
In addition to enabling the socialization among the incubatees, the events and trainings offered and visited by incubator employees and incubatees act as exchange forums for interactions with incubator staff, incubatees and external network members. Thereby, the events and trainings are not just informational sessions, but also offer a possibility to connect and network, and in so doing capturing the actual and potential resources including knowledge residing in the network is enabled.

*We have trainings, to which trainers, that are often also professional service providers, come. - - Entrepreneurs can then later be in contact with them if needed, as they have seen whether these service providers are professionals in their opinion.* (Interviewee F)

*For example in our breakfast events we always have a start-up intro, so our clients introduce themselves. Many stakeholders attend these events, various actors, entrepreneurs and others. In that way they [incubatees] can present themselves, and these networks approach them, once they have become known in that network.* (Interviewee F)

Rice (2002) argued that business assistance can be either reactive or proactive. In reactive mode, the entrepreneur is the initiator and requests help when needed from the BI. On the contrary, the incubator manager / employee can be proactive and engage in helping the incubatee on an episodic basis. Moreover, the empirical evidence shows that the capturing of value depends greatly on the incubatees' activity. The incubators simply create the premises for value creation, but the incubatee is still responsible for its capturing, thus the incubator is in reactive mode. In addition, incubatees' motivation is one of the activators that need to be in place in order to get access to social capital (Scillitoe & Chakrabarti, 2009).

*We create possibilities for them, and bring people for them to see etc. But usually it depends on their own activity.* (Interviewee F)

*We understand that they will do their work well if we will be active. - - If you just sit and wait for something, you won't get anything.* (Interviewee L)
Last, all the participated incubators acknowledged the cooperation between incubators locally, nationally, and even internationally to be of great importance. The collaboration of these actors can enhance the knowledge mobility even more.

*What we are currently working on is cooperation between incubators.* (Interviewee A)

*We are currently developing an ecosystem. So that the knowledge and know-how, which would benefit the company and its development, would be available somehow. We try to utilize what already is here [in the region], so that we don’t need to everything by ourselves. We do a little too much of overlapping things. In the future we aim at developing our cooperation in order to get services for all of these companies in a wider scale.* (Interviewee F)

*We try to partner with each and every interesting incubator or Technopark in Russia ranging from here to Krasnoyarsk, Novosibirsk and Toms, because each of them has their own unique competitive advantage.* (Interviewee J)

Ensuring knowledge mobility in the network is not tied to any specific business incubator process stage. Instead, knowledge mobility management is needed throughout the process.

**Maintaining network stability**

It was evident from the data that some of the incubators managed their network stability by enhancing reputation, whereas others identified their lack of reputation. As discussed earlier in the study, a strong hub firm reputation discourages actors’ attempts to disconnect from it and at the same time encourages the formation of new connections (Dhanaraj & Parkhe, 2006). When asked from one of the interviewees why they joined the incubator, the answer was “it’s the only one on the market now, as far as I know” (Interviewee L). On the contrary another incubator had identified their lack of visibility and reputation, and clearly identified it as a problem:

*For example X [a local accelerator] has gotten a lot of visibility on their operations, which helps them. I was giving a lecture for*
students, and almost everyone recognized $X$, but hardly anybody recognized Spinno. Therefore, I pieced together that if someone from this crowd was starting a company, they wouldn’t directly come to us. (Interviewee E)

Moreover, visibility is important value offering for the incubatees, since an incubator is a way for a small company to get noticed, for instance in media or large exhibitions:

They said that it is sort of a media visibility issue [to go to the accelerator $X$]. From there we could get media visibility easier and better. And, especially for us, since our idea has the potential to develop into a phenomenon, it would be extremely important. (Interviewee H)

Many companies, factories and large businesses take part in these exhibitions, and usually the exhibitions get support from the government. So, it is very important for us that we can be at a big and attractive stand. (Interviewee L)

Moreover, the reputation of the incubator gives the incubatees credibility.

It [incubator] helps with things like that. It legitimizes the company a little bit more, so we can say that we are part of this incubator - gives credibility. (Interviewee C)

We go usually along [to meet investors] at least to the first meeting. If they trust us - - we are sort of “door openers”. - - If we would want a specific investor to invest in one of our clients, it is a different thing when we can call and say “Hi Anssi!” compared to that one of our clients would call “Hi my name is $X$ $X$…”. (Interviewee A)

In addition to managing network stability by enhancing reputation, network stability is maintained by promoting multiplexity, which refers to two or more types of relationships occurring together. Dhanaraj & Parkhe (2006) argue that a hub firm can enhance multiplexity by doing additional projects with network members or by encouraging networks members to work together. As mentioned in previous chapters, the incubators actively bridge together different network members, and thereby actively promote their cooperation.
Maintaining network stability in the network is not tied to any specific business incubator process stage. Instead, it is needed throughout the process.

**Managing innovation appropriability**

Managing innovation appropriability refers to capturing the value generated by an innovation (Teece, 1986). Dhanaraj & Parkhe (2006) suggest that the strength of an appropriability system is mainly based on relying on social interactions with partners, as well as depending on trust. Thus, an important task of the hub firm is building and supporting trust. The empirical evidence shows that trust was an important aspect in managing innovation appropriability in business incubator network. It seems that the strength of the appropriability was not related to formal contracts, but rather on social interactions with partners and trust between them. In fact, trust seemed to be an important aspect not only in the aforementioned sense, but also affecting mediation and knowledge mobility. Trust was evident from the data in two ways. First, the incubator employees used their personal networks to get help and access to different actors in their network.

*The role of personal connections is 99%. What is important is whom you go to sauna or fishing with, with whom you went to the university. - - I use my personal network full swing. For example, I have a good friend with whom I go to sauna. We were at the university, and he’s a president of a big bank. So, whatever banking comes, I shoot him. It means that a good project will not be thrown into the garbage bin. (Interviewee J)*

*Yeah, he [incubator employee] comes to them [investor meetings] as well, because they are usually people that he knows. He has a lot of connections personally, so it’s good to have him there. He makes a friendly atmosphere in the meetings. (Interviewee C)*

*Of course connections can be very personal in a certain way. you have created a good relationship with a person, and it works through that. (Interviewee E)*
However, Hansen et al. (2000) point out that it is important that the connections are more related to the incubator instead of being related only to individuals. Therefore, personal networks also pose a challenge for incubators in a sense that if a person leaves the incubator her/his connections might leave with him if they are not transferred to other people in the incubator and incubator employees put in stake their own personal reputation when working with personal connections.

_I also have to work with how strong of a recommendation I give. Especially if it is the case of an investor. - - At the same time we put in Spinno’s reputation, but also I put in my own reputation if I recommend some project._ (Interviewee E)

A possible way to overcome this is to create relationships that are connected more to the incubator than to specific individuals.

_A challenge is typically what happens if you put too much on the network. If a person leaves the position, the connection is lost. That’s why when we work with somebody we try to enter through that person, but normally we try to set up some few other connections._ (Interviewee J)

Second, informal connections were often preferred over formal ones. Some of the respondents noted that things get done more easily and people are motivated to participate if they are not formalized. For instance, the Joensuu Science Park business incubator has formed an informal group among the local support organizations for entrepreneurs. Their aim is to reduce overlapping in their operations, and thereby be able to offer even better services for entrepreneurs.

_It is unofficial, and we run that orchestra. - - We want things like this [informal collaborations], because every time someone establishes a similar group it is always very formal. Then when you have a note in your calendar of a formal meeting, and then a friend calls you and asks you for lunch and you go. If the network is managed from top to bottom people are not motivated in participating._ (Interviewee A)
Managing innovation appropriability in the network is not tied to any specific business incubator process stage. Instead, it is needed throughout the process.

### 7.3 Comparison of Finnish and Russian business incubators’ network coordination

Previous research suggests that business incubation is moderated by the state of the economy (Hackett & Dilts, 2004a), country specific institutional factors, such as government policy, investment decisions, as well as by the relevant innovation systems (Freeman, 1987; Lundvall, 2007; Deak & Podmetina, 2013). Based on the cross-country comparison of Finnish and Russian business incubators’ network coordination, it is evident that the mechanisms used by the incubator are mainly similar, however some differences were found.

**Cross-country comparison of network management**

Network management mechanisms include selection, setting goals & monitoring, and mediation. No significant differences were found in the selection criteria between Finnish and Russian BIs. Selection in both countries was both entrepreneur- and idea-focused. However, the flexibility of selection varied between the cases. Finnish incubators seemed to focus on the picking-the-winner approach, whereas Russian incubators applied more of the survival-of-the-fittest thinking. Especially, in one of the Russia BIs the selection was quite loose; which was due to the lack of applicants. The reason for the lack of applicants might have been the young evolutionary stage of the incubator. However, it might also be connected to the lack of interest in entrepreneurship. This, on the other hand can originate from the overall state of the economy and culture. In fact, currently the major barriers to entrepreneurship in Russia are its overly restrictive regulation, exceptions to the rule of law, and a lack of competition. Whereas, in Finland entrepreneurship is gaining popularity, and an overall policy shift towards SMEs is ongoing. Thus, incubators are faced with the problem of excess amount of applicants.
Setting goals and monitoring appeared to be more organized in Finnish BIs. Finnish incubators applied the staged incubator process to give structure to the program and to act as an objective setting framework. Whereas, setting goals was done mainly in the beginning of the process, and monitoring in the end of the process in Russian BIs. The outcome of this may be better monitoring for the Finnish cases. However, in all of the cases monitoring was also dependent on the incubatee activity. Thus, if the incubatee regularly contacted the incubator and asked for support and advice, it was received. According to the data, the nonexistence of staged process was due to the nonlinear character of innovation in one of the Russian BI, and due to the early evolution of the other BI. In order to know if not using a staged process is common in Russia, a larger sample of BIs should be analyzed. Therefore, it is difficult to know if it is only incubator specific, or if it is a common scheme in Russian BIs. If it is a common practice, a common reason for it should be found. Furthermore, mediation was done similarly through introductions and referrals in all of the cases. Moreover, the importance of personal networks was emphasized.

**Cross-country comparison of network orchestration**

Network orchestration mechanisms include activation, enabling knowledge mobility, maintaining network stability and managing innovation appropriability. In both of the countries activation was an important orchestration mechanism to get new actors to join the incubator network. The aim of activation is to get people to become interested in entrepreneurship and apply to incubators as they get knowledge on the possibilities that incubators have to offer. In addition, to applicants, incubators activate other actors as well in order to grow their resource base. Activation was done mainly by incubator managers giving presentations in various organizations and lecturing. Activating potential applicants was especially emphasized in the other Russian incubator, because the amount of applicants was insufficient at the time.
According to the data, enabling knowledge mobility is a crucial orchestration mechanism for all of the cases regardless of the country. It was mainly done by creating exchange forums for interactions via offering coworking spaces or virtual platforms and by organizing joint events and trainings, where incubatees could share ideas, discuss and support each other, as well as connect and network with other actors in the incubator network.

Furthermore, some similarities as well as differences existed in maintaining network stability between the two countries. In all of the cases BIs maintained network stability by enhancing multiplexity. The incubator actively connected different actors of the network together, thus encouraged cooperation between network members. However, only one of the Russian incubators actively maintained their network stability by enhancing reputation, although other incubators had identified their lack of reputation. It is obvious that an incubator with a lot of positive visibility will attract more applicants, and thereby will have a better position in choosing the projects which have the most potential to succeed. In addition no differences were found in managing innovation appropriability, i.e. managing the value capturing generated by an innovation. It was mainly based on trust in all cases according to the empirical evidence; the incubators encouraged social interactions especially between the incubatees and preferred informal relationships.

The reason for so many similarities in the cross-country comparison might be that all of the incubators were mainly oriented to ICT and technology, although in addition they had incubatees from various other sectors as well, and, ICT and technology industries are quite well developed in both countries.

The cross-country comparison of network coordination in business incubation is summarized in Table 8.
Table 8 Cross-country comparison of network coordination mechanisms in business incubation

<table>
<thead>
<tr>
<th>Network management</th>
<th>Finland</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selection</strong></td>
<td>Entrepreneur- &amp; idea-focused Picking-the-winners</td>
<td>Entrepreneur- &amp; idea-focused Survival-of-the-fittest</td>
</tr>
<tr>
<td><strong>Setting goals &amp; monitoring</strong></td>
<td>Clear structure, tight Staged incubation process as a framework Partly reactive</td>
<td>No clear structure, loose Setting goals done mainly in the beginning of the process Monitoring mainly in the ending of the process Reactive</td>
</tr>
<tr>
<td><strong>Mediation</strong></td>
<td>Introductions, referrals Importance of personal networks</td>
<td>Introductions, referrals Importance of personal networks</td>
</tr>
<tr>
<td><strong>Activation</strong></td>
<td>Giving presentations in various organizations, lecturing</td>
<td>Giving presentations in various organizations, lecturing</td>
</tr>
<tr>
<td><strong>Enabling knowledge mobility</strong></td>
<td>Organizing and taking part in trainings &amp; events Coworking space / Cloud based service for informal communication</td>
<td>Organizing and taking part in trainings &amp; events Coworking space</td>
</tr>
<tr>
<td><strong>Maintaining network stability</strong></td>
<td>Enhancing multiplexity</td>
<td>Enhancing reputation Enhancing multiplexity</td>
</tr>
<tr>
<td><strong>Managing innovation appropriability</strong></td>
<td>Importance of trust Importance of personal networks</td>
<td>Importance of trust Importance of personal networks</td>
</tr>
</tbody>
</table>
7.4 Revised framework for network coordination in business incubation

Based on analysis of the empirical findings the framework created on the basis of prior research was revised. The revised framework proposes network coordination mechanisms used in the business incubation process, and the value that is created through the network for the incubatees (see Figure 11).

First, the network management mechanisms in business incubation consist of selection, setting goals and monitoring, and mediation. Selection is an important mechanism as it forms the basis of creating a good network of incubatees. Incubators need to be able to identify the ideas that are promising from the ones that need some other organization’s help or from the ones that simply cannot be helped. In relation to the business incubation process selection takes place in the beginning of the process. Next, setting goals and objectives is important to understand where the team or company is going. In addition, the set goals act as a base for monitoring activity through which incubators’ keep track of their incubatees’ development. In relation to the business incubation process setting goals and monitoring is mainly executed in the points where stages change, the may take place during specific stages as well. Therefore, it can be concluded that setting goals and monitoring applies to the whole incubation process. Last, an integral part in the network coordination of business incubators is mediation. The business incubator acts as a mediator between various actors and the incubatees by making introductions and referrals between them enabling especially preferential access to networks of experts, knowledge and knowhow as well as capital. Mediation is executed throughout the business incubation process.
The network orchestration mechanisms in business incubation consist of activation, enabling knowledge mobility, maintaining network stability and managing innovation appropriability. Activation refers to discreetly motivating selected actors to participate in business incubation. It is an ongoing orchestration mechanism, although from the perspective of an incubatee, he/she has been activated before joining the incubator. Moreover, this research makes a distinction between mediation as aforementioned direct actions versus mediation as creating the premises for possible networking. The latter is called enabling knowledge mobility, which is done by enhancing the strengthening of social capital. Thus, the incubator creates the premises for knowledge mobility to take place by offering coworking spaces, and organizing and taking part in various events and trainings. Further, network stability is mainly maintained by enhancing reputation and encouraging multiplexity. The reputation of the incubator gives incubatees credibility and visibility. Last, innovation appropriability was managed relying on social interactions and trust between partners, rather than on formal contracts. All of the three aforementioned orchestration mechanisms are executed throughout the business incubation process.
This aim of this research was to investigate the role of network coordination in business incubation. Thus, the research explored how business incubators as hub firms orchestrate and manage business incubation processes. Additionally, a cross-country comparison was conducted to identify possible similarities and/or differences in network coordination mechanisms of BIs in different innovation environments. Based on prior research and the empirical analysis management and orchestration mechanism relevant to business incubation were identified. The results suggest that the role of network coordination in business incubation is significant, and it can be argued that network coordination enables value creation in the network. In the following chapters the conclusions of the research are presented; the research questions are answered, theoretical and managerial implications are pointed, limitations are addressed as well as future research suggestions are presented.

8.1 Discussion and conclusions

Our aim is not to drive the engines; we are here to put the rails in place. (Interviewee J)

Business incubators have an important role as instruments in promoting entrepreneurship and innovation. Thereby, they contribute to local and national economic development by creating jobs, revitalizing cities and regions, commercializing new technologies. However, in order for this to happen, business incubators need to be understood and properly managed – coordinated. Dyer & Nobeoka (2000) claim a network can be superior to a firm as an organizational form if it can create a strong identity and coordination rules. The view of a business incubator as a network of actors fits well into the network era we are living in. In fact, prior research suggests that organized networks and network access are one of the most important factors influencing business incubation success (Hansen, et al., 2000; Lichtenstein, 1992; Aernoudt, 2004; Rice, 2002). Yet, there have been fewer
studies which are able to explain how these networks are coordinated – managed and orchestrated.

Therefore, the problem of network coordination in business incubation has been under investigation in this study. The main research objective of this study was to investigate the role of network coordination in the business incubation process. Thus, the research aimed to understand how the business incubator orchestrates and manages the business incubation process in its different stages. In addition, the value created for the incubatees through the network was researched, as well as obstacles hindering the value creation possibilities. Moreover, a cross-country comparison of Finnish and Russian business incubators was conducted. The main research question of the study was “What is the role of network coordination in the business incubation process?”. Before answering the main question, the sub questions will be examined.

The business incubator as a hub firm coordinates its networks in different stages of the business incubation process in the following way. The coordination mechanisms in business incubation are divided into management and orchestration in line with prior research by Ritala et al. (2012). The business incubation network is managed by selection, setting goals and monitoring, as well as mediation. The network management mechanisms support prior research on network management (Möller & Rajala, 2007) and business incubation (Bergek & Norrman, 2008; Scillitoe & Chakrabarti, 2009; Hackett & Dilts, 2004a). Only one of the management mechanisms can be tied into a specific incubation stage; selection is done in the beginning of the process.

In addition to the management mechanisms, the incubator also orchestrates its networks. This enabling coordination is done via activation, enabling knowledge mobility, maintaining network stability and managing innovation appropriability. The three latter orchestration mechanisms introduced by Dhanaraj & Parkhe (2006) were applied to the business incubation context.
quite successfully, although all of the original components were not found in the business incubation network. All of the orchestration mechanisms are executed throughout the business incubation process.

Furthermore, value is created through the incubators network for the incubatees. With the help of the aforementioned mechanisms the incubatees get credibility and visibility, access to resources, capital, knowledge and knowhow, preferential access to networks of experts and support systems, and faster learning and solutions to problems. The main challenges in network coordination are related to portfolio strategy, project based incubation and the personality of networks.

The network coordination in Finnish and Russian business incubation is quite similar, with only minor differences. First, it seems that Finnish incubators select their incubatees with more strictly. They focus on the picking-the-winner approach, whereas Russian incubators apply more of the survival-of-the-fittest thinking. Second, setting goals and monitoring appeared to be more organized in Finnish business incubators. Finnish incubators applied the staged incubator process to give structure to the program and to act as an objective setting framework. The outcome of this may be better monitoring for the Finnish cases. However, in all of the cases monitoring was also dependent on the incubatee activity. In terms of the other coordination mechanisms; mediation, activation, enabling knowledge mobility, maintaining network stability or managing innovation appropriability, no significant differences occurred in the data. The reason for this might be that all of the incubators were mainly oriented to ICT and technology, although in addition they had incubatees from various other sectors as well, and, ICT and technology industries are quite well developed in both countries.

Based on the research it can be concluded that the role of network coordination in business incubation is significant. Network coordination is in the heart of business incubation as the incubators nowadays are structured
as network organizations. Therefore, it can be argued that network coordination enables value creation in the network.

### 8.2 Theoretical implications

The theoretical framework underpinning the study was constructed from current theories and prior research on networks and their coordination (Möller & Rajala, 2007; Ritala, et al., 2012; Ritala, et al., 2009; Ritter, et al., 2004; Dyer & Nobeoka, 2000; Möller, et al., 2005; Gulati, et al., 2000; Lorenzoni & Lipparini, 1999) and business incubation (Bergek & Norrman, 2008; Hackett & Dilts, 2004; NBIA, 2014; Aernoudt, 2004; Hughes, et al., 2007; Dichter, et al., 2010; Hansen, et al., 2000; Tötterman & Sten, 2005; Hackett & Dilts, 2004a; Rice, 2002) in order to form a profound base for further empirical investigations. The theoretical contribution of this study is thereby primarily related to concepts, models and theories underpinning business incubation and network coordination research. However, combining these fields of research is already a contribution to the existing literature as no previous research (that of the researcher is knowledgeable of) has integrated these theoretical constructions.

**Network coordination**

Overall this study contributes to the literature on network coordination by offering new insights and empirical evidence on network coordination practices as it is explored in a previously unexplored context. For classifying the business incubator network, the value system network perspective of Möller & Rajala (2007) was adopted. The evidence suggests that the BI network has characteristics from multiple networks; business renewal networks, customer solutions networks, as well as innovation networks. Thereby, the research suggests that the classification of networks by Möller & Rajala (2007) could be extended to cover even more various types of networks.

Furthermore, empirical results of the study support Ritala et al.’s (2012) idea that network management and network orchestration can co-exist in practice.
Business incubator networks offer an interesting example on how the hybrid form of coordination is executed in order to create value for network members. Moreover, it was found that management mechanisms in business incubation network include selection, setting goals & monitoring, and mediation. The network management literature reviewed in this study did not include selection or mediation, but they were adopted from business incubation literature (Bergek & Norrman, 2008; Hackett & Dilts, 2004a). In addition, selection as a management mechanism can mostly likely be found from human resource management or supply chain management literature. Thus, this research adds to business network management literature by suggesting the inclusion of selection and mediation mechanisms. Furthermore, in line with Dhanaraj & Parkhe’s (2006) research orchestration mechanisms include enabling knowledge mobility, maintaining network stability, and managing innovation appropriability. However, not all of the factors inside these concepts were found in the business incubation network. Moreover, the study contributes to orchestration literature by suggesting an additional network orchestration mechanism - activation of potential network members.

Business incubation

This study is in line with previous studies (Lichtenstein, 1992; Hansen, et al., 2000; Aernoudt, 2004; Rice, 2002) suggesting that networking and network access are one of the most important factors influencing business incubation success. Moreover, Tavoletti (2013) points out that there is a great need of theory on how BIs should be managed. This research contributes to business incubation literature by addressing his notion partly, and thereby offers new evidence on how the business incubator manages its network. In addition a lack of cross-country studies on business incubation exists (Deak & Podmetina, 2013). Thus, this research provides up to date comparative evidence on business incubation from two countries, Finland and Russia. Moreover, the research adds to prior business incubation research by providing a framework for network coordination in business incubation.
The research support previous research (Bergek & Norrman, 2008), and highlights the importance of selection as a management mechanism in business incubation process. In addition, the research is in line with Scillitoe & Chakrabarti’s (2009) notion on that selection is one of the activators through which the team gets the opportunity to access the network, and social capital. Hackett & Dilts (2004a) suggest that BIs create value when selecting teams with greater potential for success by helping contain the cost of potential entrepreneurial failure, enhancing the chances for weak, but promising firms’ success, as well as offering teams that are not selected the possibility reconsider their business model. To add to this view, the research data suggests taking into consideration as well the possibility that the business model might be good, but the appropriate help might be found from another organization. The correct directing of an applicant to an organization which suites the entrepreneur the best is important, for instance, from the perspective of economy in terms of job creation. Moreover, the study confirms that the more the team has abilities, including intellectual capital and combinative capabilities, the easier it is for them to understand and create value from network gains (Scillitoe & Chakrabarti, 2009).

Furthermore, this study adds to business incubation literature by introducing the concept of network orchestration (Dhanaraj & Parkhe, 2006) to business incubation research. In accordance with the results, network orchestration in this context comprises of activation, enabling knowledge mobility, maintaining network stability and managing innovation appropriability. Activation, as a network coordination mechanism has not received a lot of attention in prior research (that of the researcher is knowledgeable of). However, according to the evidence, activation activities were clearly a part of BI managers’ work.

In the research of Bergek & Normman (2008) mediation refers to the incubators role to act as an intermediary between incubatees and innovation systems. It includes incubator matching incubatees with other actors with the objective of filling gaps in incubatees’ established networks. However, this research makes a distinction between mediation as direct actions
(introductions, referrals) versus mediation as creating the premises for possible networking, which is referred to as enabling knowledge mobility. Although the term enabling knowledge mobility is novel to business incubation research, the ways of enabling knowledge mobility have been identified already in prior studies (Hansen, et al., 2000; Rice, 2002). In addition, the empirical evidence is in line with Dhanaraj & Parkhe’s (2006) findings that maintaining network stability can be executed by promoting multiplexity and enhancing reputation. In addition, this study is in line with Dhanaraj & Parkhe (2006) suggestion that the strength of an appropriability system is mainly based on relying on social interactions with partners, as well as depending on trust.

Last, previous research suggests that business incubation is moderated by the state of the economy (Hackett & Dilts, 2004a), country specific institutional factors, such as government policy, investment decisions, as well as by the relevant innovation systems (Freeman, 1987; Lundvall, 2007; Deak & Podmetina, 2013). Although this study investigated network coordination practices in business incubation in Finland, and Russia, major differences were not found. However, the study supports the idea that government policy affects business incubation. In Finland an overall policy shift towards SMEs is taking place, and it was evident from the growing popularity of business incubation. Whereas in Russia the growing number of incubators reflects the current policy for fostering innovation. Overall, this research adds to prior research by presenting cross-country evidence on one sphere of business incubation.

8.3 Managerial implications

This study has several managerial implications as it provides insights on the role and mechanisms of networks coordination. BI managers can use the model developed in this study to evaluate their own practices, develop inspections points, and develop their own practices.
First, activation should be considered as an active mechanism, which might result into more applicants, and thereby to better ideas and teams. In addition, to applicants, incubators activate other actors as well in order to grow their resource base. Second, selection is an important in managing BIs. The incubator managers should carefully select their incubatees, as by selecting teams with greater potential for success BIs helping contain the cost of potential entrepreneurial failure, enhancing the chances for weak, but promising firms’ success, as well as offer teams that are not selected the possibility reconsider their business model. Moreover, the selection criteria and strictness of selection should be evaluated in BIs.

Furthermore, BI managers should evaluate and carefully plan how they set goals with their incubatees and how they monitor them. Monitoring incubatees can enable them to learn and get solutions to problem faster. Moreover, BI managers need to act actively as a mediator as it is one of the best ways for incubatees to get preferential access to networks, and thereby the development of their venture can be improved. In addition, other actors, such as professional service providers, should also keep in mind, that by creating a connection to BI managers might be a way for getting customers for their own services. Although the connection BI managers have are often from their personal networks, in order to keep the connection available for incubatees at all times, BI managers should rethink ways to linking the connection more to the incubator as well.

It is important to recognize that enabling knowledge mobility is one of the most important mechanisms in orchestrating the incubator network. Creating premises for interaction and knowledge exchange creates social capital and synergies. Although more and more virtual incubators are being established, incubatees appreciated coworking spaces, as there they could interact with other incubatees. Therefore, a solution somewhere in between incubators offering office space or virtual incubation could be considered. In addition, BIs should take into consideration that creating a portfolio of firms and advisers that incubators can leverage is important for successful a successful
incubator. Thus, moving towards more industry focused incubation is a possibility.

Finally, it is important to understand that the incubator only creates the premises for value creation, thus the responsibility of value capture is on the incubatees. Incubatees need to be motivated and active to be able to capture the benefits created through the network; get credibility and visibility, access to resources, capital, knowledge and knowhow, preferential access to networks of experts and support systems, and faster learning and solutions to problems.

**8.4 Limitations & suggestions for future research**

The lack of available data required to limit the size of the sample. The ideal sample that was expected would have included four incubators and three incubatees from each of the incubators. Due to challenges accessing the data and time limitations sample size was smaller than what was planned. However, additional incubatees may have not provided any more new information. Therefore, more incubators should be included in the sample to get more generalizable results. As with a sample size, such as used in this research, it is hard define whether differences are in fact related to contextual factors. Thus, future research with larger sample size should be conducted. Results from a study with larger samples size could give additional, more detailed, reliable and generalizable insights on the researched issues.

Moreover, although this study focused on similarities and differences rising from the environment, some of the differences in the researched cases may have been connected to the evolutionary stage of the business incubator itself. However, addressing the evolution of the incubator was out of the scope of this research. Therefore, future research should take into consideration the evolution of the incubator itself. A study of BIs in different evolutionary stages or a longitudinal study would best reveal how network coordination changes in parallel with the evolution of the BI itself.
Moreover, the fact, that the study examines network coordination in business incubation, but emphasizes only the role of incubatees instead of other network actors, constrains the results of the study. Future research should address this limitation by including other network actors in the research as informants in addition to incubator employees and incubatees’ representatives.

Some limitations of this research are connected to the measures used to collect the data. Part of the interviews were conducted in a language which was not first language of the interviewer and/or the interviewee. This might have resulted in misinterpretations either by the interviewee or the interviewer. The suggestion for future research concerning data collection methods is to conduct interviews using the first language of both interviewer and interviewee. Thereby, more rich and detailed set of data could be collected as the interviewee is able to tell everything that she/he has in mind and the interviewer interprets the discussion properly. Another limitation is related to the sources of the empirical data, due to the fact that self-reported data can be rarely verified. It may contain several sources of bias, such as selective memory and exaggeration.

This study had a specific focus, investigating network coordination in business incubation, and comparing these mechanisms in the case countries. The aim was not to examine overall differences in business incubation practices in the case countries. Still a lack of cross-country comparisons in business incubation research exists; therefore future research should investigate business incubation in a more general level in cross-country settings. Additionally, quantitative studies should be conducted.
REFERENCES


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Appendix 1 Interview cover letter

Dear recipient,

I am studying in the Master's Programme in Strategy, Innovation and Sustainability of the Graduate School of Management (GSOM) of St. Petersburg State University and the School of Business of Lappeenranta University of Technology (LUT). Currently I am working on my Master's Thesis, in which I study the network coordination of business incubators. The aim is to understand how the networks of business incubators are coordinated and what its role is in the different phases of the business incubation process.

Therefore, I am hoping that you would have the possibility to participate in my research as an interviewee. The individual interview can be conducted in _______ when and where it is best suitable for you. The length of the interview is approximately one hour. If you are interested in taking in part to the research, but the aforementioned dates are not suitable for you, we can discuss other possible dates as well.

In order to get a full picture of the researched issue, in addition I would like to interview three of your client companies’ representatives. The three companies should all be in a different phase of development. I would be very grateful, if you could send me contact information of potential interviewees.

The supervisors of the research are Professor Paavo Ritala (paavo.ritala@lut.fi) from LUT School of Business and Professor Andrey Ivanov (ivanov@gsom.pu.ru) from the Graduate School of Management.

If you have any questions concerning the research, please do not hesitate to contact me via e-mail. Moreover, I am asking you to reply to this message in one week, so I can plan my research schedule further.

Thank you in advance for your interest!

With best regards,
Annastiina Norppa

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Annastiina Norppa
annastiina.norppa@lut.fi
Appendix 2 Semi-structured interview guide / Incubator representative

BUSINESS INCUBATOR INFORMATION

- Year established
- Current tenants / graduates
- Institutional mission / strategy (non-profit/ profit oriented)
  - Sales per year
- Main & secondary objective (e.g. regional development, create start-ups, entrepreneurship, employment, business etc.)
- Industrial sector (e.g. generic, university research area related, specific, e.g. high-tech / Internet-related)
- Target market (regional, national, international)
- Location (close to polytechnic, university, industrial estate etc.)
- Services offered (Office space, coaching, funding, information technology, public relations, recruiting, legal, accounting, other, organized networking)
- Management team (acting as intermediaries, not directly involved in new ventures, directly involved in the new ventures with the provision of personal capital, knowledge, management, skills, day-by-day support)

BUSINESS INCUBATION PROCESS

- What are the different stages in your business incubation process? (e.g. selection, pre-incubation, incubation, post-incubation, graduation)
  - Incubation period
NETWORK DESIGN

- Do you aim at a dense or a loosely coupled network?
- What actors form your network? (e.g. incubator management & staff, incubator advisory board, incubatees, local universities / polytechnics, industry contacts, and professional services providers (lawyers, accountants, angel investors etc.), alumni)
  - Internal / External
- Are the companies in your portfolio related to one another either by industry or by technology?
- How strong is the portfolio of companies, strategic partners and external advisers?
- In your current network, do you have all the resources needed by incubatees?
  - If not, what are you lacking?

NETWORK COORDINATION

- Who is the main coordinator (hub company)?
- How is the network coordinated on different stages of process?

Stage by stage:

- How do the companies network with one another?
- Is networking institutionalized (organized mechanisms) or does it depend on personal connections?
  - What are the organized mechanisms?
  - What kinds of capabilities or skills are needed?
    - The role of individual vs. organization
  - Internal vs. external network
- Coordination by commanding (contracts, deadlines etc.) vs. coordination by enabling (creating a vision etc.)? Something else?
- What value does it bring to the incubatees / or others?
- Please, provide an example of how you helped a start-up to gain critical resources quickly via networking?
• What are your strengths & weaknesses (individual & organizational) in networking?
• What are the biggest challenges & opportunities in networking?
• Examples?

CLOSURE
• Do you have additional topics you want to suggest?
• Or, additional interviewees to suggest?
Appendix 3 Semi-structured interview guide / Incubatee representative

COMPANY DETAILS
- Name / position
- Brief background of the company
- Current situation
- How many people does the company employ?
- Sales per year
- How long has the company been located at the business incubator?
- What was the status of the company when it first started operating at the incubator? (start-up, existing firm)
- Is the company’s main site at the incubator or elsewhere?

BUSINESS INCUBATION
- Why did your company decide to join the incubator?
- What were the expectations from the incubator? What did you want to gain?
- Why did you choose this incubator?
- What sorts of incubator services have been particularly useful?

NETWORK COORDINATION
- What actors from the incubator’s network have been useful to you? (internal / external)
- How did you reach them?
- What value did they bring?
- What is the role of the incubator in network coordination?
  - How is knowledge transferred?
  - How are IPR managed?
• How would you evaluate the coordination of the network from the incubator's side?
• What are the skills / capabilities needed in network coordination?
• Your strengths / weaknesses + Incubator's strengths weaknesses
  o Have you learned new skills?
• Is something missing from the incubator's network?

FUTURE PLANS
• Will you continue in the incubator?
• What kind of network expectations do you have?

CLOSURE
• Do you have additional topics you want to suggest?
• Or, additional interviewees to suggest?