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Abstract

Factorial conditions and functional actions affecting the prospect of an industry development

Felicia Walldén Cerna and Rebecca Markgren

Sweden has yet to fully explore its industry regarding wild berries, with the resource patiently waiting in the forest to be used, with great potential for future endeavors. When it comes to wild berry related innovations, not much has happened in Sweden in the last couple of decades, with the technique of freezing houses being the most recent. Another country close to Sweden with possibly a more developed wild berry industry is Finland, which leads to the aim of this study which is to conduct a comparative study based on the separate countries' innovation systems through a company perspective. The study was conducted by a comparative approach with data collected via literature studies and interviews gathered with purposive sampling. To further investigate the differences between the two countries facilitating and hindering aspects, a performance matrix was applied. These were ultimately connected with functions of innovation development based on the innovation system approach, and a reflection on cumulative causation. The results indicated most facilitating aspects in Sweden as originating from demand side actors, and most hindering aspects as originating from actors third party and companies. In Finland, most facilitating aspects come from companies and third parties, and most hindering aspects also come from third parties as well as supplier/ labor actors. The innovation system analysis found Finland to have more facilitating aspects relating to functions contributing to the inception of innovations while compared to Sweden. The study concluded that Sweden has great opportunities to flourish in the industry, however the interplay between actors should follow a more Finnish approach.

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Popular scientific summary

Innovation has for a long time been an attractive topic in the business world, however it has been a concept difficult to define with savvies giving it several different definitions. It can nevertheless be summarized as the act of achieving or developing something new. Innovation insinuates on bettering and providing value for society, companies and individuals with new technologies or ways of doing things. When wanting to investigate why innovations are either occurring or not, the framework Innovation System can be of interest. For this study when referring to the Innovation System, we are insinuating on the environment surrounding an industry where innovations are or should be taking place. The Innovation System consists of a set or network of distinct actors that either together or individually contributes to the development and diffusion of innovations. All actors influence the Innovation System through factors in either a facilitating or hindering way for the creation of new innovations. To understand the setup of actors within an Innovation System, how they relate to one another and how they affect the system and each other, researchers have previously used a Performance Matrix (also known by other names) to identify the factors. The factors represent different innovation facilitating or hindering aspects such as laws, norms, relations, networking, and knowledge diffusion. By identifying these factors together with which actors being the reason for that state, one (a company, a country, a researcher, or anyone interested) can create an understanding and strategies of what areas that need to be fostered or improved.
This specific study was connected to RISE and their FINEST project, with them wanting to further develop Sweden's wild berry industry. When referring to the wild berry industry in Sweden, not much has happened in the more recent decades when it comes to developing new innovations. However, the neighboring country Finland seems to be much more up to speed when it comes to the topic, leading to the objective of this degree project. For this study, a comparative study was to be executed regarding both countries Innovation Systems through the Performance Matrix. Data was collected through literature studies and semi-structured interviews sampled using purposive sampling, basing the interviewees on them being a part of the wild berry industry in one of the two countries as well as having a company's perspective.

Our findings indicated that Finland seems to have more collaborative interactions, especially between the actors *Companies* and *Third Parties,* which foster innovation creation, as well as them noticing a great demand from consumers. Sweden also saw a great demand, however they seem to lack the knowledge regarding how to meet this demand. This is likely because of *Weak Network* between actors and strict regulations regarding extracting the berries as well as taxation of berries, leading to emigrating innovators. Finland's problem areas seemed to be relating more to the lack of berries.
For summarization, Finland has utilized more of their preconditions whilst compared to Sweden and is therefore more ahead when it comes to innovations in the wild berry industry. Nevertheless, Sweden most likely has the preconditions to flourish in the industry, they just need to explore and utilize it further.

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This project is a master's thesis in the Industrial Management and Innovation programme at Uppsala University in Sweden. Students Felicia Walldén Cerna and Rebecca Markgren developed the entire project and wrote the thesis together. The work was planned with clear weekly and monthly goals and discussed before a new chapter was started and was then divided between the two students. All work written independently was further reviewed, developed, and completed by the respective student each week. In this way, equally distributed work, relevance, and quality could be assured.

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Abbreviation

ELYC	Center for Economic Development, Transport, and the Environment
EU	European Commission
IS	Innovation System
NFA	The National Food Administration
RET	Renewable Energy Technologies
RISE	Research Institutes of Sweden
TIS	Technical Innovation System

1. Introduction

In Europe, Sweden is one of the largest producers of wild berries with the total biological production estimated to be over 550 000 tons. The wild berry production consists of mostly bilberries, lingonberries, crowberries, and cloudberries. However, only 2-5 percent of the production is utilized, providing the industry with great potential for future development. Today, Sweden exports 10,000 to 15,000 tons of wild berries annually and is the main provider since Sweden accounts for about half of the world's wild berry market (Miina et al., 2021; RISE, 2020).

Between 1990 to 2000 the wild berries market value increased due to identified health effects. The demand for wild berries from Northern Europe and Russia increased due to its high percentage of antioxidants (Craviotti, 2012). The wild berries are fragile, especially the bilberries, and need to be frozen shortly after being picked to restore quality. In 1960 the so-called freezing houses were introduced and enabled the wild berries to be stored and processed. The technology for cleaning the wild berries is by freeze-cleaning which consists of blowouts, sorting, and electronic identification/quality assurance. The cleaning processes are becoming more advanced, the freezing houses remain, and the most produced products in Sweden are juices and jams (Jonsson & Uddstål, 2002). A country close to Sweden which has a bigger and more evolved processing industry, as well as a vaster consumer market of wild berries is Finland. They use about 35.000 tons of wild berries for personal consumption and another 15.000 tons are processed. Out of the processed wild berries, the fresh and frozen market consists of about 6.000 ton of wild berries, and another 4.000 tons are exported (Himelrick, 2001).

The innovation system (IS) is a set of actors which both individually and jointly affects innovation in the area they operate within, such as a country, industry, or other setups. An IS operates by searching for innovations to develop, utilize and diffuse, as well as to ensure sustainable socio-economic growth at different levels by fulfilling a range of functions. The system thereby has the capacity for a progressive development (Lyasnikov et al., 2014). In an IS there are several different actors who all can play a vital part in the network of creating innovations. The different actors create factors (such as legislation and funding) that influence the process of innovation, thereby insinuating on the importance of a well-functioning IS for the creation of innovations (Klerkx, Van Mierlo, & Leeuwis, 2012). What makes innovation concerning agriculture particular is the fact that it’s not just about adopting new technologies, but that it also requires a balance between factors such as how the new technology is practiced and alternative ways of organizing. Relating to e.g., labor, distribution of benefits and land tenure (Klerkx, Van Mierlo & Leeuwis, 2012). Several researchers have used an IS matrix for the conduction of studies aiming to investigate and/or compare IS (Woolthuis, Lankuizen & Gilsing, 2005; Klerkx et al., 2015; Debaire et al., 2008). The IS matrix identifies enablers and disablers of IS, so called factors relating to the actors that play the most vital role. These can help understand what causes an area of interest, such as a company or a specific project, facilitating and/or hindering situations.

1.1 Literature summary

The following paragraphs will provide a brief literature introduction of the IS as well as the performance matrix framework and how it has been utilized in previous studies. An IS framework/approach contains different concepts and definitions, which are the system, and innovation together with a range of different definitions (Granstrand & Holgersson, 2020). A national IS can for example include all aspects of institutional setups and economical structures which are affecting different systems knowledge development (e.g., marketing, and finance systems) and their opportunities to search and explore. While a regional IS is geographically oriented and focuses on factors concerning proximity in R&D, innovation and diffusion which creates clusters regionally. Therefore, an innovation supporting institution for regional productions structures. Another is sectoral IS which is a group of firms which actively strive for developing and producing products for a sector and in exchange use the sector's technology. Here technological innovations are in focus and the sectoral IS is confined to just firms. While Corporate IS includes resources, activity, and actors together with institutions that somehow has a meaning for the innovative performance within actors such as universities and companies (ibid).

Some typical aims and results when researching an IS can be demonstrated with following examples. A literature study by Negro, Alkemade, & Hekkert (2012), investigated the development of IS regarding renewable energy technologies (RET). The finding resulted in an overview of typical systemic problems, such as hard institutions, market structures, soft institutions, etc., that hindered the diffusion and development of RETs. Phenomena, such as "not in my backyard" and attentional shifts of policy makers within the IS, laid the ground for typical downfalls. The writers suggest solutions such as specific policy measures, consistent and long-term policy initiatives, and more careful listening by policy makers of new entrants and small innovative firms.

Hanson et al. (2021) investigated Norway and The Netherlands co-evolution of IS and industry formation through analyzing offshore wind. Through conducting nearly 60 interviews they found that The Netherlands had focused more on explicit IS while building strategies. They also found that oil and gas have a critical impact regarding offshore wind on both countries. And lastly, that The Netherlands has a stronger IS compared to Norway because of the country's closer industrial proximity. These are all factors important to take into consideration for each country to develop further throughout their separate presumptions.

Another study was conducted by Hermans, Klerkx & Roep (2015) with the purpose of examining the structural conditions regarding agricultural IS within eight different European countries. This, whether they can facilitate or hinder social learnings and collaboration in an innovation network. The method used was the conduction of the IS Failure Matrix by investigating enablers and barriers regarding the eight countries. The results showed that the most important threats for a collaborative network was the lack of funds together with vertical and horizontal fragmentation, as well as the lack of conduction of proper evaluations.

According to another thesis of Lundgren (2021) Sweden is to a wider extent focused on a global market while Finland is more nationally focused when it comes to the wild berry industry. Lundgren suggests further research to compare Sweden and Finland's differences concerning the wild berry industry.

Further, Hermans, Klerkx, & Roep (2015) investigated how characteristics of different IS concerning agriculture could facilitate or hinder opportunities for innovation networks. They suggest that particular IS in terms of agriculture shall be studied to determine whether new actors are necessary to include if specific innovations for collective goods shall be facilitated and if the particular IS is suffering from vertical or horizontal fragmentation.

Dahesh et al., (2020) further evaluated the IS concerning agriculture. They examined the IS structure and dynamics as one of the most important areas of research within innovation. The study was conducted as a systematic literature review and could conclude that the most common areas of research regarding IS has been business, management, economics, environmental and urban planning. The study further concluded that emerging issues within the subject are dynamics, knowledge exchanges, and networking. The researcher suggests a range of further necessary research areas to be conducted as is one the issues on environmental degradation and resource scarcity. The areas of issues to be considered are, for example, agricultural innovations, new considerations regarding such as education and models for micro-level IS.

It is by this we chose to focus our study on IS concerning agriculture since wild berries can be seen as a part of fostering of forest resources and production of food. The study shall focus on IS and explore the preconditions of innovation development regarding the wild berry industry. A comparative study of Sweden and Finland can contribute to the gap of needed understanding of both countries' wild berry industry, their IS focused on micro levels and create a better understanding of each country's facilitating and hindering preconditions for an industry sector.

Former information leads this study into the problem definition which will be explained in the following chapter.

1.2 Problem definition

For the conduction of this degree project, we will be working with the external partner RISE, along with their FINEST project, who are working towards Swedish wild berries being utilized to a greater extent in foods. Their purpose is to produce healthy and tasty foods but also for furthering development of the Swedish wild berry industry. According to RISE, market opportunity for Swedish wild berry industries might not yet have reached its full potential (RISE-FINEST, 2020) and research mainly focuses on development for exportation and labor rights when picking berries.

According to Roger Uddstål[1] Swedish wild berry companies focus on collecting, freezing, and selling berries, while incumbents in Finland are more prone to make investments to R&D concerning innovative wild berry products. Uddstål believes that the Swedish wild berry industry could become more competitive if it shifts its focus to a more interconnected and prominent industry, rather than endure in trading with several intermediaries in the form of wholesalers who aim to raise prices. However, Finland's engagement in the wild berry industry's development could be based on factors that are not yet to be seen in Sweden, such as more governmental support, demand, and knowledge or similar. Further on, Swedish forests are, according to Uddstål, producing far more wild berries than Finland, making Sweden a main provider of the wild berries to several countries. Even though Sweden is a main producer of the wild berries, companies rarely strive for innovating and to explore the existing international demand of wild berry-based products. Ultimately leading to the objective of this study which is to investigate this phenomenon.

1.3 Aim and purpose

The aim of this study is to compare Sweden and Finland's wild berry IS from the perspective of companies and clarify their respective IS, its driving factors and underlying functional conditions. The purpose is to contribute with a better understanding of what differentiates Finland's wild berry IS from Sweden's and whether there are important IS aspects for each country to consider.

1.4 Research questions

To fulfill the aim and purpose of this study, three research questions have been developed:

1. What factors hinder and facilitate the development of the innovation system around wild berries in Sweden and Finland?

2. Within the innovation system, does either country have a more fostering environment, within the innovation system for the wild berry industry to innovate and develop? If so, which functional aspects shape these environments?

1.5 Limitation

Firsthand data collection will only be provided through companies' perspective to identify their beliefs on hindrances and facilitators within the wild berry IS. It is a necessity to narrow the study and its sampling to provide a first focal point of the wild berry IS in Sweden and Finland. Further on, the IS matrix, which includes different actors and factors, will be limited to those that will be determined through data collection to be most relevant for the wild berry industry from a company perspective. Moreover, the discussion section of the study will be limited to the results which are found to be most relevant according to the performance matrix based on interviews and empirical findings.

[1] Roger Uddstål, wild berry industry expert at RISE. Zoom interview, 2022-02-15.

1.6 Outline

The next coming chapter will provide the reader with a background based on empirical findings gathered through secondary data collection regarding relevant subjects. The following chapter will present the theoretical framework where valuable notions are described to give the reader basic knowledge for further understanding of this study. Concepts such as the IS and IS approaches will be provided, as well as cumulative causation and a description of the performance matrix. This information will later lead on to the method chapter which depicts the chosen research design, how data was collected for the study as well as provide a quality analysis based on authenticity, trustworthiness, and the study's ethical aspects. After the methods chapter, the results of the study will be provided together with an analysis. The first section of the results and analysis chapter will present first-hand data collection including an analysis of how the data is to be integrated with the performance matrix as well as its actors and factors. The following section of the results and analysis chapter will illustrate the performance matrix based on the findings from the first- and secondhand data collection (chapter 5.1 and 2). The performance matrix will be presenting both positive as well as negative aspects for the respective countries. Nearing the end of the report a chapter discussing the findings and connecting them to the IS approach and its functions will be provided. Here the empirical findings and the findings collected through first-hand data will be presented, ultimately ending the report with a brief conclusion.

2 Background

The following section will present the literature results with the aim of bringing valuable background information regarding the wild berry industry. The data will be used to validate the interview results as well as create discussion.

2.1 Agriculture

Agriculture covers several activities and terms such as horticulture, pastoralism, crop-livestock, and cultivation. It is a comprehensive word that can denote the many ways in how humans are provided with different products and food (Harris & Fuller, 2014). Natural resources are the foundation of agriculture and Sweden is one of Europe's largest countries when it comes to area. Sweden and Finland are covered by mountains, forests, lakes, bogs, and marshes. The area of cultivation or agricultural land is approximately 9% in Finland, 8% in Sweden, and forestry covers up to 75% respectively 69%. Other areas in Sweden such as mountains, marshes and natural grass covered areas stand for 20% which leaves only 3% that constitute settlement areas while Finland has up to 6% settlement (Statistikmyndigheten, 2021; SLC, 2020).

The agricultural revolution went from gathering of wild plants - wild plant production and storing - cultivation and domestication of plants - to today's agriculture, cultivation of domesticated crops, intensification, and diversification (Harris & Fuller, 2014).
In the 18th century Sweden was a poor nation which could not, even though hard efforts, secure the provision of food to the whole population. The agricultural development stood still due to food crises and crop failures, and the wild plants became crucial for the subsistence economy. Since the 18th century authorities have strived to improve agriculture by propagandizing new food alternatives and before the industrialization very few new food alternatives were accepted. The effort to introduce lichens failed and mushrooms were not socially accepted until 1930-40 by the urban population. Between the world wars the authority tried to increase the interest for wild plants as food. By informing through existing media and education the usage of wild plants took form in recipes for such as jams, marmalade, and biscuits. Today, the media still shows how the wild plants of the North can be used, and with the rights of public access to wilderness (allemansrätten) allows people to consume freely on the natural assets (Svanberg, 2012).

In the present, climate changes are expected to challenge Nordic agriculture but also provide some opportunities. An opportunity could be identified as a longer growing season which can improve productivity. While some adaptation can result in unintended negative results (Neset et al., 2019).

The concern of coming generations' challenges is of many policymakers and academics' interest. The food demands are predicted to become difficult and expensive due to water scarcity, climate changes, transistor energy prices and soil erosion. There is also an increasing and new demand arising along with population growth and economic inequality. The faithful beliefs on technological solutions are resting on the promising indication that improving

productivity will be restored. However, experts are pointing out the risks of increasing problems unless technology for food production increases, and at the same time, decreases the impact that agriculture has on the environment. There is today no consensus regarding the best strategies to meet the expected challenges. Some argue that hunger and malnutrition is not a question of the ability to produce food rather than poverty and lack of political power since food exists for everyone but is not able to be distributed (Fraser et al., 2016).

2.1.1 Organic berries

Since berries grow in the wild the process of producing organic berries is a bit different while compared to other crops. In Finland, the organic certification of wild berries must go through organically certifying the wild collection area - the forest. To certify the forest an initiative from either the owner (or group of owners) of the forest or by an external certifier must be made. To start the process contact must first be initiated with the local Center for Economic Development, Transport, and the Environment (ELYC) and by filling out the essential forms of application. Subsequently, organic control must be carried out to successfully deem the land as an organic collective area. This process can take up to three years if forbidden inputs have been utilized in the area, otherwise the certification period will be shorter. As of 2020, Finland has the largest organic collection area of about 12,2 million hectares, which stands for approximately 30% of all the world's collective area and 40% of Finland's whole land area. It is proposed that all forests in Finland can be deemed as organic without the need of any specific changes regarding current forest management (Ruralia Institute, 2020).

To produce organically certified berries in Sweden the berries should obtain a so-called KRAV-certification. KRAV is Sweden's most notorious labeling for sustainable food and the qualifications for successfully obtaining the labeling is determined by the brand itself (KRAV, 2022). When it comes to wild-growing produce, the area where the berries are to be picked must be approved by an independent certification company before the picking begins. The area must not have been fertilized, sprayed with extraneous chemical pesticides, or planted with trees that have been treated with chemical pesticides for the past three years to get an approved certification. The area should also not be near a busy road or other source of contamination such as an industry or landfill. The cesium content of the soil should also not exceed the limit values determined by KRAV (KRAV, 2021).

2.2 Berry picking

The picking of wild berries is one of the oldest forest activities in the Nordic and many other countries. At the start, the picking of berries was a subsistence need which shifted to more income-based purposes and recreational motives (Saastamoinen et al., 2000)
Swedish and Finnish culture has traditionally been closely linked to the forest and nature. They indicate on highly valuing the forest with evidence stating that most people feel harmonious and relaxed while spending time in the forest or at other nature sites (Mäkelä, 2021; Hörnsten & Lindhagen, 2000).
The picking of berries in Sweden has historically been an important base and found as enjoyable for many people mainly because they like to be out in nature. However, the landscape

and society has shifted during the twentieth century. In the beginning of the nineteen hundreds the land consisted mostly of virgin forest where the trees were much sparser than they are today. Between 1925 and 1995 the standing volume of forest per hectare has almost doubled with economic forests dominating. During the 20th century the Swedish society moved from being a mostly agricultural nation towards an industrial one causing rapid urbanization. This has ultimately led to beliefs and values changing since they cannot be expressed in the same way as when living in the countryside and nature not representing the daily income (Hörnsten & Lindhagen, 2000).

The native people in Finland's view on berry picking has also made a shift similar to Sweden. Historically, they picked berries alongside working on the farms to earn some extra income during the summers. But now the picking is done mainly by foreigners who arrive from Asia or Easter Europe (Alho & Helander, 2016). Even though studies show that berry picking is associated with higher ages, being woman and rural lifestyle, the berries are an important part of the Finnish diet and is a heritage tradition (Mäkelä, 2021).

In a study conducted by Hörnsten & Lindhagen (2000) they examined the public preferences and behavior linked to forest recreation between the years 1977 and 1997. The visitation of forests has mostly stayed on the same frequency throughout the years; however, the picking of berries has decreased significantly both in volume and the number of people deciding to indulge in the activity. Further occurrences causing this negative trend might be the Chernobyl accident in 1986 causing contamination of the forest including its berries in Sweden as well as in Finland, making people wanting to abstain from berry picking (Broadbent, 1988; Rantavaara, 1987). Nevertheless, according to Kalle et al. (2012) a lot of children do not have access to rural environments anymore. They indicate that a loss of access to nature will gradually lead to children no longer having plants as alternatives for such universal categories as e.g., snacks. Thereby not gaining the same knowledge about greens as previously.

2.2.1 Berry picking methods

Bilberries are today mostly picked using a traditional berry picker. These consist of a scoop, mostly assigned with teeth or shoots on the lower side of the scoop in the looks of a fork, as well as with an attached handle for easier usage. The teeth consist of elongated shoots with openings between the shoots, which are customized in such a way that the berries are caught in between the teeth/shoots and ultimately end up in the scoop. Since bilberries in most cases grow on small shrubs it means that the person picking the berries needs either to sit on their knees or to bend over to be able to reach the berries with the scoop. This act can be very wearing on peoples backs which might lead to injuries. This has given incentives for people wanting to innovate regarding this process (Patent & Registreringsverket, 2014).

In recent times a couple of patents have been created in Sweden for wanting to optimize the act of picking berries. A corporation named Berryking AB filed a patent in 2014 on a tool where they attached an elongated arm to the traditional berry picker, leading to a faster and more ergonomically friendly way of picking berries where the person can stand upright. This

innovation would also help the person to reach in between thorny shrubs and prohibit the picker from poisonous creatures such as snakes and bugs which are mostly close to the ground (ibid).

Another invention was patented by Gunnarsson (2010) where she changed the scoop into a bag. This prevents the berries from falling out in between the strokes over the bushes since they must be conducted in a downward and upward motion. The invention was also constructed so that the bags could be detached from the fork and handle section of the product, as well as the section being able to be folded for taking up less space when carrying.

Moreover, in Finland the company TaikaBerry has developed an electrical berry picker. It consists of a collection head in the form of a cylinder that can accommodate 1 liter of berries. The cylinder is equipped with rotating forks that pick up the berries from the shrubs making them ultimately end up in the collection head. The device is also equipped with an elongating arm with a handle, similar appearance to a crutch, precluding the person of the need to bend over to reach the small shrubs. The device claims to be lightweight and quiet, as well as includes a chargeable battery supposedly lasting a full day of berry picking (Taika Berries, n.d.).

Finland has also developed innovations regarding the processing of berries as well as taking it a step further as to products that can be created with berries. A company named Aromtech Ltd located in Tornio Finland uses Supercritical Fluid Extraction for extraction of key substances from different berries. This technique is a gentle and effective method with the means of recovering lipophilic ingredients from the plant matrix. Aromtech has developed a modern entity for carbon dioxide extraction which presents an aseptic production method free from oxidative and thermal stress. The method preserves the fragile and valuable fatty acids and fat-soluble nutrients in its bioactive and natural form which the company has created several different oils all with different purposes from. Today they mostly have oils retrieved from blackcurrants and sea buckthorn. However, this technique creates great possibility of similar products developed from oils extracted from bilberries (Aromtech, n.d.).

2.3 Labor

The Swedish citizens are today not finding the same need and/or interest in the picking of wild berries. Therefore, people from other parts of the world have been wanting to indulge in the activity instead to make profit (Wallis, 2020). The same goes for Finland, further back wild berries were viewed as an important source of income whilst today, as a result due to urbanization and the better living standards in the country, only approximately 10% of the Finnish citizens pick wild berries for commercial use. The utilization of foreign labor has therefore risen in both countries, especially considering corporations that sell large volumes of frozen berries. (Peltola et al., 2014; Wallis, 2020).

The foreign workers originate mainly from Thailand, but also from other parts of South-east Asia, and arrive in thousands every year for the summer season to pick berries in the Swedish countryside (Wallis, 2020).

The situation is similar in Finland with approximately 4000 foreign berry pickers that arrive every year. In Finland, the workers are provided a seasonal workers visa which gives them the ability to work in the country. However, they are not provided with a formal employment resulting in that they must sell their harvest by themselves, but most commonly it is sold to the company that invited them. In Sweden the foreign workers are employed by a company or employment agency which pays the workers for their work (Peltola et al., 2014).

However, debates have arisen regarding human rights concerning the workers with accusations of labor deprivation and human trafficking. Moreover, the sudden arrival of foreign berry pickers in isolated, sparsely populated villages in remote areas has caused controversy among local residents (Peltola, 2014).
For the Thai workers to be able to make the long trip they usually take out loans in their home country. In Sweden, the first month of work only provides the workers with the money to pay back the loan as well as the expenses while abroad. These expenses concern things such as food and accommodation as well as for travel to the berry picking sites. The Thai migrant workers work under rough conditions for long hours to be able to make a profit out of the trip which is not a guarantee since it depends on the season's outcome (Wallis, 2020).

Over the years controversies regarding the berry pickers living and working conditions has been brought to the surface. In Sweden there have been occasions where the berry pickers have not been given their salary and ultimately been forced to work under slave-like circumstances. It is also not a guarantee that it will be a good berry year resulting in there being no berries to pick. In 2013 about 200 berry pickers from Thailand had been defrauded regarding their salary and therefore went on strike, which led to a man committing suicide since he couldn't bare going back home without any money. Nowadays the pickers in Sweden have collective agreements and a guaranteed wage, however, if there are no berries the pickers are the ones taking the biggest risk. Nevertheless, not all berry pickers arrive from Thailand, but some also come from Bulgaria or Ukraine. These do not have the same advantages as the Thais since they are mostly so-called free pickers and therefore sell the berries themselves making them more exposed towards intermediaries. In 2012, around 500 berry pickers from Bulgaria were living in despair in tent camps in Norden Uppland because of them not making the expected salaries. They were eventually transported back to Bulgaria by their embassy in Stockholm (Lapidus & Engström, 2016).

Scandals regarding the topic of foreign berry pickers is not far-out when it comes to Finland as well. In 2022, the head of a Central berry picking firm in Finland was sentenced to 22 months in prison for 26 accounts on human trafficking involving berry pickers from Thailand. Back in 2016 the defendant accommodated the berry pickers in harmful conditions where they were forced to live in trailers and containers as well as to work for 15 hours a day. They were not allowed to keep their passports or plane tickets as well as them not being guided correctly on where to find the berries, resulting in them receiving low wages (Møller, 2022).

Moreover, in 2021 approximately 400 berry pickers attained the COVID-19 virus making Finnish health authorities question what could have been the cause of this. Since the berry pickers in Finland are not considered employees, they are not protected by legislation like other workers in Finland, however in Sweden they are. This signifies that no law really protects the workers from possible abuse. Because of the incident in 2016 a law came into force in the spring of 2021 where they wanted to ensure that all workers were offered the appropriate and adequate accommodation. This by only letting companies that paid their taxes and followed other social obligations to bring in foreign berry pickers. However, it seems as though the guidelines must not have been followed in the rightful manner anyways (Steensig, 2021).

2.3.1 Obtaining working rights as a foreigner

To be able to work with picking berries as a non-EU citizen in both Finland and Sweden you'll need to obtain certain permits, these are however not the same concerning the two countries (Finland Abroad, n.d.; Sweden, 2022).

In Finland the picking of wild berries goes under the virtue of the Act on the Legal Status of Foreigners Collecting Natural Products, since it does not involve an employment relationship. This visa is intended for seasonal work for up to 90 days in Finland and can only be applied for at the mission of Finland and is governed by the Seasonal Work Act which is based on the EU Directive concerning seasonal workers (Finland Abroad, n.d.).
Moreover, to be able to work as a non-EU citizen in Sweden for less than three months you must obtain both a work permit, as well as a visa. To qualify for a work permit you'll have to get an offer of employment for a Swedish employer. The offer must pay a minimum monthly wage of 13.000 SEK gross, as well as offer terms of employment followed by the Swedish collective agreements (Sweden, 2022). Other requirements that the employer must offer is the intention of taking out medical, injury and life insurance for the employee as well as provide the employee with occupational pension once employment has begun (Migrationsverket, 2021).

2.4 Laws and taxes

2.4.1 Allemansrätten (Everyman's right)

Allemansrätten, or jokamiehenoikeus in Finnish, is translated as "Everyman's right" which is a law of importance regarding nature in both Sweden as well as in Finland (Nationalparks, 2022; Naturskyddsföreningen, 2021). It's insinuating on all people's rights to enjoy nature on the countryside regardless of who owns the land. It gives the citizens as well as visitors great freedom but also great responsibility to preserve the outdoors for future generations to enjoy.
The law implies that everyone has the right to indulge in outside activities such as camping for shorter periods of time, going on walks, skiing or horseback riding, swimming, picking berries and mushrooms etc. without the need for landowner's consent. This is as long as no harm is brought on the nature as well as disturbance of nearby residents. Exceptions can thus occur regarding national parks and other nature reserves to e.g., protect certain species or sensitive areas (Nationalparks, 2022).

The law of allemansrätten is deeply embedded in both countries' cultures, where in Sweden it is also mentioned as a fundamental law; the law that everyone should have access to nature (Naturskyddsföreningen, 2021). The origin of the law can be traced back to the second half of the nineteen hundreds when the value of wild berries grew, resulting in conflicts erupting between rural groups that owned land versus those that didn't. By that time the property rights regarding the wild berries had not been explicitly defined which complicated the situation even further. There were laws in both countries defining picking nature grown resources as punishable, e.g., it was illegal to pick branches, grass, or peat without the landowner's permission, however no such law was available regarding the picking of wild berries on owned land. In the late 19th century and early 20th -century several reform and bill proposals were made in Sweden as well as one major one in Finland in 1888. But none of them passed through, leaving the picking of wild berries out of legislation. It is to this day legal to pick wild berries wherever you'd like in both countries (La Mela, 2014).

2.4.2 Taxation of berries

When it comes to the taxation of berries in Finland berry pickers are free of taxation when they have sold the berries, this given that the berries are not refined. Refinement implies on the berries being either frozen, put in conservatives, squashed, sweetened, made into juice, put into gift packages for sale or put in product mixtures. However, it does not include minor pretreatments such as cleaning or putting the berries into packages. This assumes that the berries are not sold at a specific point of sale such as the berry picker's store, but only sold at places such as at a market or similar. The salesperson on a small-scale business also does not owe any taxes if the turnover for the financial period is less than 15 000 euro. If a person comes from another country to pick berries in Finland, they don't need to pay any taxes if they stay in the country for less than six months (Vero Skatt, 2021).
Nevertheless, in Sweden the taxation of berries is only tax-free if the amount sold does not exceed 12 500 SEK during the fiscal year. The amount is individual and applies for every member of a family (Skatteverket, 2022-04-19).

2.4.3 Relationship between Taxation and Innovation

A question of interest is whether higher taxations can lead to less quantity or quality innovations. A study was conducted by Akcigit et. al (2018) where the phenomenon was investigated in the US relating taxes to location using several different methods where they all yield consistent results. The study results indicated that higher taxations had a negative impact on the quantity of innovations in the region, however not on the average quality of the innovation itself. It was also noted that corporate taxes affected the corporate inventors' innovation production as well as the personal income taxes affecting the quantity of innovations significantly. Hedlund (2019) concurs with previously described findings articulating that inefficient taxing structures and high-income tax rates can discourage innovation as well as make inventors want to move to places where taxes are not as high. However, he disagrees regarding taxes not having an impact on the quality of an innovation claiming that it does.

2.5 The market

Berry based industries have successively gone from small household scale business to global commodity chain were businesses exports berries in mass volumes. Bilberries have the largest market shares on the wild berry market and there after comes lingonberries, cloudberries, and others. The driving factor for the wild berries economical upgrading is according to Lundgren (2021) the introduction of freezing houses in the 1960s that made it possible to prevent the wild berries from going bad and to be stored for a longer period of time. The second factor is international seasonal labor mitigation which made it possible to collect berries efficiently and cheaply. The third factor is based on the opportunity to associate berries with a high economic value since they contain high levels of antioxidants and anthocyanin (Ibid).

Furthermore, Larsen and Österlund-Pötzch (2015) that studied food production in Nordic countries presented that people tend to find what once was defined as food for the poor is now considered exclusive. Many are prepared to pay more for food products that have been marketed or placed branded as homemade and/or made on a small scale and have a close by origin. Bardon (2013) made a similar observation where self- gathered or preserved berries are seen as a valuable part for a household's economy, however, not due to food shortages as before but rather because of people's need for knowledgeable food choices in this era of impersonal consumption and mass production.

The National Food Administration (NFA) in both Sweden and Finland also refers to berries and their contents of valuable vitamins. NFA Finland recommends 500g of vegetables, fruits and berries a day of which half (250g) should be fruits and berries. The 500g refers to 5-6 portions and 1 portion is around 1 dl of berries, one could therefore assume that around 100-125g berries is recommended. Sweden NFA also recommends 500g of vegetables, fruits and berries a day of which half (250g) should be fruits and berries. More specifically they refer to 125g berries containing 89% of the recommended daily intake of vitamins. This means that the total recommended amount of berries is calculated to be more than 45 kg per year per person in both Sweden and Finland (Öhrvik et al., 2011; VRN, 2014). However, the average intake of berries annually per person (both frozen and fresh) is 8 kg in Finland and a bit under 5 kg in Sweden (Jordbruksverket, 2021; Arktiset Aromit, n.d.). All above weights are summarized in Table 1 below.

Table 1. Summary of recommended berry intake from The National Food Administration Sweden by Öhrvik et al., 2011 and VRN, 2014 and actual consumption based on Jordbruksverket, 2020 and Arktiset Aromit, n.d.

Specifics (approximately estimated numbers)	Sweden	Finland
Recommended daily intake of berries per person.	125 g	125 g
Total recommended intake of berries per person annually	45 kg	45 kg
Actual consumption of berries.	5 kg	8 kg

Today, there is a wide range of Swedish and Finnish products that contain berries. What first comes to mind can often be products such as jams, frozen berries, flavored yogurts, and juices. This product has for a long time been popular in both countries and can be found in typical food stores such as ICA in Sweden and K-Ruoka in Finland.

Since berries are associated with a high nutritional substance it is also common to find berries referred to as superfood. The term is a trending label; however, it is not officially defined but represents food that are believed to have health benefits Lundgren (2021).
Some typical labeled superfood products are raw juices, food supplements in the form of tablets and powder made from dried berry juices. Some companies known to produce juices and powder are Drick RÅ and Plog Foods in Sweden, Kintama and Eevia Health Oy in Finland. The companies in Finland are using berries both from domestica areas and from Sweden while companies from Sweden exclusively use Swedish bilberries. Companies using wild berries in their actual products are many, however mostly within the above-mentioned categories. There is also a need to mark on the frozen berry suppliers since these companies are foremost the largest berry related companies when it comes to quantity (Paassilta et al, 2009).

The companies are however more than countable but can be distinguished in different groups. A vast sum of the companies are smaller initiatives which buy berries from private pickers and sell them forward to larger companies or local market places These initiatives are rarely not more than one to five members in staff. The next group includes those who process berries into products which then are sold either nationally or internationally. The sizes of these companies can vary. The third group includes bigger companies that gather large volumes of wild berries, clean and freeze them and sell them either or both nationally and internationally to industries or stores. These companies constitute a smaller part of the wild berry sector but with a large share of the total world berries being used for commercial purposes (Ibid). Paassilta et al. (2009) does however point out the wild berry industry's struggle of creating long term and stable international relationships due to difficulties of ensuring a standing amount of berries. This problem further affects the development of new and innovative products that can extend the market.

Vital factors that have a significant contribution to a company's innovative capacity and activities can be presented in four grounding factors as the first one is technological strategies that are focused and adapted to the business plans, with leader resources and planning expertise that can apply and implement. A second factor is the generation of ideas and their quality, both formal and informal. Especially big scale companies have long and broad market and technological experience that contributes to a vitreous cumulative characterization of looking for new knowledge and improvements. The last two factors are technology acquisition and exploitation which refers to the abilities of procuring technology, advanced knowledge, and research capacity. This can be done both through internal development or with external suppliers. Other important areas to take in consideration are collaboration/ cooperation, constant learning, engagement and delegations of leaders and the networking to extend market and technology possibilities (Martínez-Román et al., 2019; Koc & Ceylan, 2007; Pratali, 2003)

2.6 Associations, networks, and collaboration

In Finland there are two non-profit organizations within the berry sector. The first one is Arctic Flavors Association (Arktiset Aromit Ry) which focuses on bringing actors on the wild product market together, these actors are represented by all from large companies, to private persons and entrepreneurs. Arctic Flavors also focuses on bringing up issues on utilization and quality regarding the wild berries and natural products. A second association is the Wild Organic Product Industries' Association (Luonnontuoteteollisuus Ry), that helps represent Finland's berry and similar companies within the natural product market. In 2000 Swedish wild berry companies also formed an association called the Swedish Forest berry Association (Skogsbärbranschens Intresseförening). The goal was to communicate the wild berry sector's issues and to influence the common opinions. They further engaged in research and development that was of the berry sector's interest. At the start there were about 50 company members but had an abrupt end after ten years when the interest among the members declined due to limited influence in governmental actions. Since then, there has not been any similar association in Sweden (Paassilta et al., 2009; Arktiset Aromit, n.d.; Brändström, 2011).

Paassilta et al. (2009) during their study concluded that interests of cooperation among wild berry companies were real. This was also confirmed during the Nordic Wild Berry seminar held at Oulu, Finland in November 2008. Even though interest was shown, actions are not taken and Paassilta et al. (2008) states that even if interest is shown in a survey, it might not mean that actual efforts will take place in real life. They further emphasize the potential such an association could have and that a strengthening network should exist with the wild berry companies that can work together both within and across borders.

Studies have shown that collaboration among actors can result in several facilitating benefits. Through collaboration it is first easier to approach new actors as financially once and minimizes the risks that come with research and development projects. It has also been shown that flow of information increases which can improve the potential of reaching individual and common goals regarding research and development, also regional development. It can be more demanding work when collaborating over actor categories, but it all leads to new and better

relations, knowledge and attractive perceptions among customers and partners. It can however take a long time to establish collaboration among companies, universities, and governments due to cultural gaps that must be overcome. A good thing is to understand that part of the collaboration process, which can make it easier to formulate goals that fit everyone's expectation (Deitz et al., 2010; Lundberg and Andresen, 2012).

According to other researchers, local food systems shall improve communities' health and long-term sustainability (Born & Purcell, 2006; Connelly et al., 2011; Hinrichs, 2003). The two approaches of sustainability and social economic growth are criticizing economic growth from a mainstream point of view due to its failures to consider social and environmental concerns. Local food initiatives can aim to reach structural changes regarding how food is accessed, produced, and consumed. Connelly et al. (2011) point out that these approaches can make changes by establishing coming infrastructure that can facilitate food alternatives concerning sustainability and social rights. It also offers alternatives to traditional systems and is intending to generate revenue by themselves. Last, these local initiatives depend on consumers' behavioral changes and can reach a decentralization of food systems that can foster local self-reliance. The challenges for these initiatives do however rest upon the social economical views since it depends on investments in both physical and social infrastructure from policy makers and the society.

The support in terms of economic resources is offered both by the European Commission (EU) and the national governments in Sweden respectively Finland. The European Structural and Investment Funds is divided into five funds, where more than half of EUs total funding is divided too. The purpose of these funds is to invest to create more jobs and a sustainable and healthy European economy and environment. The five different funds are managed by the European Commission along with the EU countries and covers rural development (European Commission, 2022). The aim of rural development is to contribute to sustainable development of rural areas by:

- *fostering the competitiveness of agriculture and forestry.*
- *ensuring the sustainable management of natural resources and climate action.*
- *achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment. - EU (2022)*

The Government Offices of Sweden has also presented a food strategy for the entire food supply chain in Sweden. The food strategy is a platform that shall hold the direction of the policy to create stability and ensure long term approach. The hopes are to contribute to society in the form of more work opportunities, public goods, and sustainable growth. It shall further create a competitive food industry in Sweden.

The primary reason for this initiative is the necessity to adapt to climate changes and strengthen competitive ability on the global market. The objective for strategic areas covers:
- Rules and regulations that shall be designed to support the competitive and sustainable food chain by appropriate charges and taxes, simplification of regulations, minimization of administrative and other measures to strengthen competitiveness and profitability.
- Consumers and markets where the goal is to have a high degree of confidence among consumers and to create good opportunities for exports for growth by meeting demand and reaching relevant markets.
- Knowledge and innovation that shall support the system to increase productivity and innovation in the food chain and have a sustainable production and consumption (Government Offices of Sweden, 2016).

Finland has also presented a report on a food policy in 2016 which aims to promote the society's well-being and nutritional status and covers areas such as production, processing, distribution, and consumption of food. The report contains the political goals and priorities of the necessary actions for the future.
Their vision is to have the best food in the world. By 2030 the Finnish consumer shall eat tasty, healthy, and safe food that has been sustainable and ethically produced and shall have the ability to make informative choices.
It shall be a system that is characterized by transparency, high skills, flexibility, and an internationally profitable and competitive system that responds to demand. The sector's advancement and growth are going to be supported by research, teaching, development, and innovation with high levels of marketing and communication skills. Finland is by then also supposed to be a significant exporter of safe and qualitative food and skills. The objective actions are several but can be summarized as:

- Primary production that investigates local agricultural enterprises and building of regional economies. It has focus on policy enabled, natural water resources, different support schemes and fundings, and production that can respond to changes with focus on the environment.
- Routes for food that aim to create collaboration among food companies and multiple purchasing channels.
- Research, advice, and training that shall have targeted research, more diverse competence, improve competence by training and advice, funding systems, and research and development corporations to identify new opportunities.
- Food culture, public health and security shall be improved by education, good food safety, strengthening food services, support in decision making regarding policies, and risk management.
- Competitiveness focuses on international and exports, competitive advantages and responsible livestock, and employment (Mmm, 2016).

3. Theoretical framework

In the following chapter a few different concepts will be presented to give valuable knowledge to further understand this study as well as be able to relate to the chosen method. The chapter will initiate with a more in-depth definition of the IS, ultimately leading into IS approaches describing how innovations takeoff. The following subchapter will provide a description of the concept cumulative causation, ending with a presentation of the performance matrix.

3.1 Innovation systems

Before going into a further description of the concept of IS, the word will be picked apart describing the concept of *innovation* as well as the concept of *system*.

The concept of Innovation - is today foremost defined as the result of a process and characterized by the properties, degree of newness from a change and the degree of its usefulness/success when being applied (Granstrand & Holgersson, 2020).

The concept of System - is based on components and then relations in between those components. A common characterization of a dynamic system is the input which, by carrying out activities by actors that are interacting with an environment, are turned into outputs (ibid).

The concept of *IS* initially developed importance in the mid-1970s when strong insights into the economics of innovation and the development of new ideas regarding the non-linearity and complexity of the innovation process were discovered. A summarized description of IS can be defined as all important factors, concerning such as economic, social, political, organizational, and institutional factors, that influence the development, diffusion, and use of an innovation (Warnke et al., 2016). When talking about the concept IS it is viewed as a co-evolutionary process where several different actors can play a vital part when in a network, ultimately creating social, economic, combined technological and institutional change. It suggests that the exchange of knowledge and production are not the only prerequisites for creating innovation, but in fact several factors originating from a number of different actors influence the process. These factors are e.g., legislation, funding, policy, infrastructure, and market developments which all stem from actors such as the government and universities. I.e., for an IS to adopt new innovations, there needs to be a balance between alternative ways of organizing, networking, and new technical practices (Klerkx, Van Mierlo, & Leeuwis, 2012).

The IS can be conditioned as four main elements which are the institutional structures (formed by e.g., companies, R&D, or networks), the incentive system (e.g., technological transfer or business formation), the creativity and skills of innovation and economic actors (e.g., between and within countries), and the cultural peculiarities (reflected in e.g., user understandings). All these elements operate within the country, region, or sector in question (Warnke et al., 2016). The concept of IS focuses on the stream of information as well as technology that moves among all the affected actors (Granstrand & Holgersson, 2020).

3.2 Innovation system approach

An IS is often not given a constructed goal but can basically and generally be described as developing, utilizing, and diffusing innovations. However, actors within the IS can have their own goals and driving forces. Therefore, identifications of functions within an IS approach is necessary to analyze and understand what is contributing to innovations development, utilization, and diffusion. A function is those components that contribute to a system goal, if not contributing it is not considered to be a part of the system. What their components, individually or clustery, are contributing with is what we call a function (Johnson, 2001). There are three different and major IS approaches called:

- *The national system of innovation approach* - focusing on R&D performing organizations (called narrow definition) and all that's affects learning (called broad definition)
- *The technological system approach* - focusing on how actors within an IS affects a certain product or technologies development, utilization and diffusion, and.,
- *The network/development block approach* - which instead of looking at the whole IS, as the above, rather focuses on the smaller parts of an IS. Those parts are relations between actors, and development blocks which focus on filling out gaps by actively looking for new solutions and actors that can contribute to complementary stages such as creations or identifications of markets (ibid).

The function that will serve as this study's framework during analysis of results and the discussion is based on Hekkert´s et al. (2007) seven functions with the allusion of Jonsson's original framework for further and deeper understanding of its origin.

Hekkert´s et al. (2007) function framework is based on Johnson's (2001) functions which are ten instead of seven. Johnson considered "identifying problems" and "creating new knowledge" to directly relate to the innovative process and its steps while the other eight functions are indirectly supporting the innovation process, also called support functions. Hekkert et al. (2007) on the other hand proposes a framework that focuses on a few processes that are of great importance for an IS to perform well. The goal with the new formulated framework is to develop a framework that is less static and that does not lack the sufficient attention towards micro levels like the original IS framework does. They label the framework as "functions of IS" and its purpose is to focus on the important processes that are needed to take place within an IS in need for it to produce development and diffusion. The set of both theories functions are presented in Table 2.

Table 2. Function framework based on Hekkert et al. (2007) and Johnson (2001).

Function	Johnson (2001)	Hekkert et al. (2007)
Function 1	"Recognition of potential growth" which is a necessity to get resources and bring innovations to the market.	Refers to "entrepreneurial activities" being a vital part for the development of innovations. Entrepreneurs turn knowledge, network, and markets into tangible actions and thereby generate and take advantage of new business opportunities.
Function 2	Identifying problems by "creating new knowledge".	Implies on "knowledge development" and R&D being a central activity for development within an IS.
Function 3	"Facilitating the exchange of knowledge and information" can help by providing feedback between the goals and system performance.	Refers to the "knowledge diffusion through networks", with the distribution of information within a network considered as an essential function.
Function 4	"Guide the direction of search" Guidance of where actors put their resources. This concerns foremost technical areas but also such as different markets.	"The guidance of the search", which implies the importance of choosing what innovation to invest in when resources are scarce, thus being able to give the innovation sufficient funding for reaching its full potential.
Function 5	"Stimulate/create markets" since markets do not necessarily occur on their own. Diffusion and exchange is also a matter of facilitation.	"Market formation" intends on the significance of how the market is formed for the new product to be able to compete in the market.
Function 6	"Supply of resources" which sometimes are identified as indubitably fundings and competence.	"Resources mobilization" refers to the necessity of the allocation of important resources, both financial as well as human capital, to make the knowledge production possible.
Function 7	"Counteract the resistance to change" that sometimes occurs when society is introduced to innovations. This could be based on such as unwillingness to leave an old product behind or fear of the effect on employment.	"Creation of legitimacy/counteract resistance to change" refers to new technologies needed to be a part of an incumbent regime or in some cases overthrow it in order for it to succeed. It creates legitimacy for a new technological orbit and ultimately investors.
Function 8	"Identifying problems" and covers the importance of identifying a system's bottlenecks.	
Function 9	"Reduce social uncertainty" this could i.e., be the uncertainty of how some will act or react but could also prevent and solve conflicts based on misunderstanding between actors.	
Function 10	The necessity of returns on an investment. "Companies need incentives to engage in innovative work".	

The set of functions all influence each other, the fulfillment of one function likely affects the fulfillment of other functions as well as the other way around, ultimately leading to either a virtuous or a vicious cycle. One theory states that the function fulfillment leading to a virtuous cycle creates momentum towards creating a process of creative destruction within the specific organization. The model between the functions is not linear with the functions having multiple interactions between each other. However, there is a much smaller range of possible starting points. Figure 1 illustrates typical starting points (motor A, B, and C) bringing change in the system as well as the functions typical influences on other functions. Motor A refers to entrepreneurial activities that lobby towards the market for creating sought out playing fields, whereas motor B suggests entrepreneurs lobbying to receive more resources to be able to perform R&D. Motor C suggests a trigger towards a virtuous cycle being what technologies incumbents decide to invest in which leads to knowledge creation (Hekkert et al., 2007).

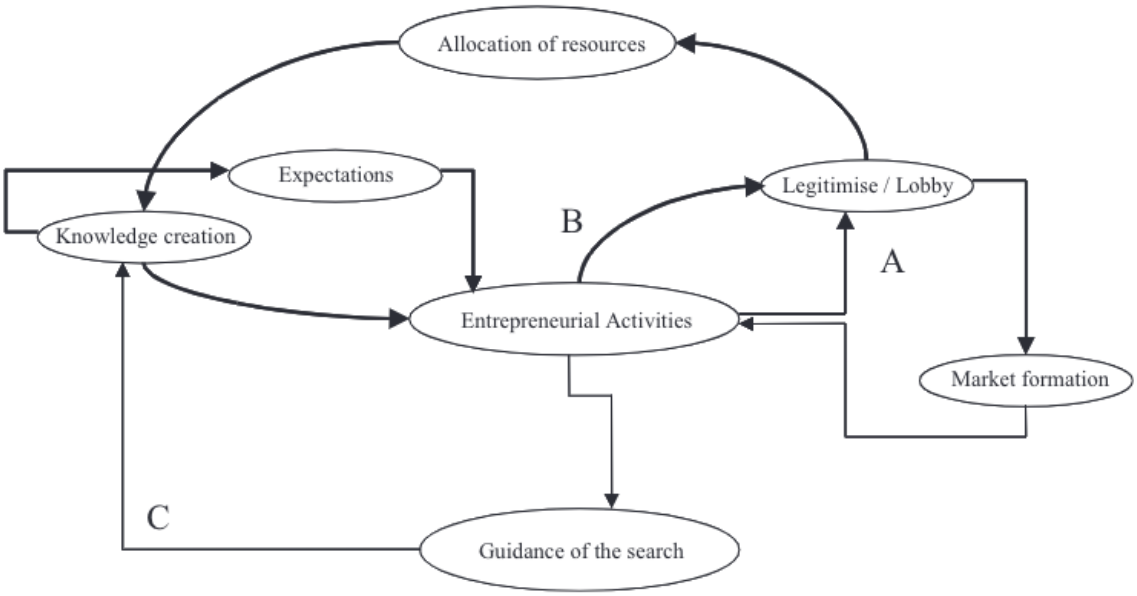

Figure 1. Three typical motors of change considering interactions between the seven functions

3.3 Performance matrix

While determining the performance in regard to IS, identifying failures and facilitators (collective name: factors) for its functioning is of interest. The factors have been created to define what may fail or facilitate the performance on an IS which are presented in Table 3.

Table 3. Failing and facilitating factors based on Klerkx, Van Mierlo, & Leeuwis, 2012 and Hermans, Klerkx & Roep, 2015.

Factor	Meaning
Soft institutional factors	Unwritten norms, values and rules often defined by culture or "the way business is done" between actors. It constitutes practices of good business and how the actors are (in)able to change behavior and/or operations to foster development/ innovation.
Hard institutional factors	Too strict or lack of regulations, laws, and other formal rules, that ultimately hindrance innovations, development and/or performance. On the other hand, there can be formalized rules that support and foster development such as regulating the ability of intellectual property which makes it possible to protect innovation.
Infrastructural factor	Refers to physical infrastructure such as railroads, telecommunication, and roads. These types of constraints often require large investments and cannot be developed independently by one actor. The infrastructural factor also concerns big financial investments for knowledge (such as R&D facilities) of public and private research.
Interactional factors:	Strong and weak network failure becomes an interactional network facilitator when there is balance between them both.
Strong network failure	Refers to actors being too closely linked in their business relationship ultimately causing nearsightedness, difficulty in forming new ideas and possibly not creating new rewarding relationships.
Weak network failure	The exchange of learning and innovation between actors not being connected enough is prevented because of the lack of creative recombination of resources and knowledge. Weak network can lead to missed opportunities for collaborations and advantages in exchange of resources and knowledge.
Interactional network facilitator	Meaning, the balance we are looking at is, when companies are embedded in strong relations with each other and open for newcomers to share opportunities, knowledge, and resources. Knowledge is flowing between firms and strengthening the individual and collective capability. The network-based knowledge diffusion is both embedded and dis-embedded. There can also be a distinction between vertical network (communication and coordination from governments and down) and horizontal network (communication and coordination between actors of similar nature)
Capabilities factors	The organizational and technical ability of the actors to handle and adapt innovations. This can be things like the entrepreneurial ability, knowledge within the organization and the space / time to be able to innovate and network.
Market structure factors	Referring to the relations and positions between market parties. Failures can be caused by e.g., monopoly, imperfections in the "knowledge market" as well as the lack of transparency.

When looking to investigate why an IS is or is not developing as expected or desired, different matrices have been created to more easily be able to determine which actor (presented in Table 4) is affecting which factor. For instance, Woolthuis, Lankhuizen & Gilsing (2005) developed a system failure framework for innovation policy design. There they identified distinctions between rules (factors) and players (actors) in the IS and defined them as crucial regarding system failures for innovation. The findings of system failures then served to design an IS matrix also called system innovation-framework, IS failure matrix and IS performance matrix. Actors are defined as firms, universities, and policy makers, etc. that strive for reaching goals. The rules, or also called institutions as mentioned above, are defined by the actor's result of actions. The method was used as a tool for policy makers and researchers to analyze where and what failures/bottlenecks occur and determine what players or interactions are the obstacles. It can also help to justify the policies that actors choose to focus on and evaluate current policies.

Table 4. Actors. Based on Hermans, Klerkx & Roep (2015) with adjustments for relevance of this study.

Actors	Sub actors
Demand	Consumers, markets, and large buyers.
Companies	Wholesaler, companies small to large size, producing companies, startups, and other utilizing companies.
Supplier/Labor	Berry pickers and firsthand suppliers of berries.
Knowledge Institutions	Universities and R&D centers.
Third Parties	Governments, municipalities, banks, and sector associations/ non-profit organizations.

In the article conducted by Woolthuis, Lankuizen & Gilsing (2005), they investigated the development of an overnight express train between Amsterdam and Milan. Figure 2 demonstrates how the matrix helped identify actual bottlenecks for the project. All identified stakeholders in the respective countries were onboard with the project and considered it to be promising. However, the project faced several obstacles concerning regulations and technicalities across the passing countries. Figure 2 shows what the framework suggested to be focused on, which was involving rail companies, customers with interest to use the express train and the European Commission. However, the overnight express project chose to establish closer cooperation between only Dutch companies, which also is demonstrated in Figure 2. The project ended up unsuccessful even though all parties supported and acknowledged the importance of the project, due to wrong failure focuses. The mention of ECP.nl in Figure 2 is another example where the analyzed company chooses to follow the suggestions from the framework and end up with successful project results (ibid).

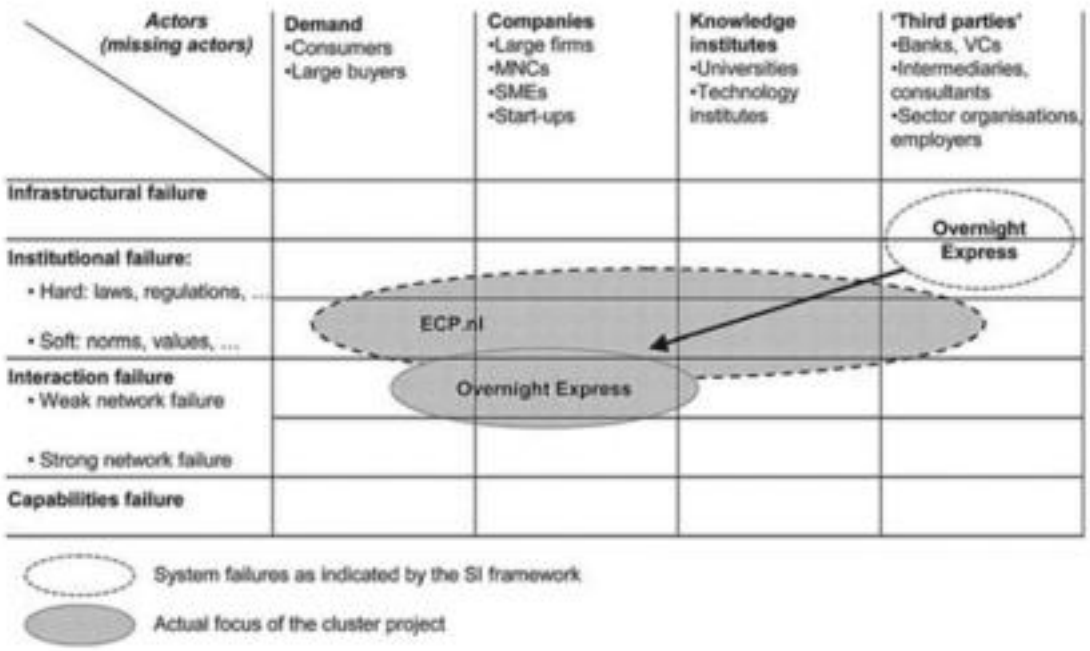

Figure 2. The observed vs. the actual addressed system failures.

Another example of where an IS matrix is used is in a study by Klerkx et al. (2015), which aimed to investigate the key tensions causing the so-called know-do gap in the public health sector. This by investigating through a broader perspective using a systematic approach as well as interpreting the public health sector as an IS. To highlight the principal tensions and IS matrix was implemented on the data collected through interviews. They could thereby identify seven different key tensions regarding the fact, these were e.g., no consensus could be found regarding the criteria for the quality of the knowledge and that there were different perceptions regarding the knowledge broker's role. The study could conclude that making the know-do gap smaller is quite complicated and the perspective from an IS is vital.

Further on, following examples are of highest interest since the degree project will be mainly relevant concerning agricultural IS. Making this an area of empirical contributions a significant aspect in the coming empirical study.

An article utilizing a similar framework was conducted by Debaire et al. (2008) calling it an innovation-performance matrix. The goal of the study was to develop a framework to estimate innovation linked to performance in the chain of fruit supply. They identified critical success factors for innovation in the food chain respectively performance in the food chain. As a result of the study, they successfully developed a framework consisting of a supply chain process model as well as an innovation-performance matrix. The findings have later been implemented in several apple chains in The Netherlands.

Another article of interest was conducted by Hermans, Klerkx, & Roep (2015) where they investigated how characteristics of different agricultural IS could facilitate or hindrance opportunities for innovation networks. By using the IS failure matrix, they adapted the approach by also focusing on strong points and thereby called it the IS performance matrix. The matrix contains relevant actors for their study as well as factors that could facilitate but also hindrance the performance in an IS. The researcher started by investigating general setups for agricultural IS in different countries. The findings were then used as respective country resorts and reworked into the matrix and then labels by closed coding followed by open coding into more detailed subcategories. The results of the matrix and the subcategories could reflect existing situations and finally the factors of failures and successes were compared and evaluated. The study identified public research funds to be one of the main hindrances. Another finding also shows that innovation policies are often too complex to suit necessary evaluations regarding agriculture.

3.4 Cumulative causation

The theory and term cumulative causation was coined by the Swedish economist Gunnar Myrdal and first applied in 1944. The idea of the phenomenon is that a current condition or event can lead to either a virtuous or a vicious cycle, meaning a complex chain of events that are amplified can result in either favorable or detrimental conditions. A vicious cycle is defined as two or more events that exacerbate each other and thereby lead to a downward spiral. In a virtuous cycle, one positive event naturally leads to a second more positive one, ultimately leading to an upward cycle leading to growth (Maritim, 2021).

Examples of a vicious cycle in cumulative causation can for instance be countries that have experienced war or political unrest, leading to loss of competitiveness in the global market. Such conditions can lead to worsened market prices and thereby less resources, ultimately creating a downward spiral. To end the cycle on some occasions the government needs to intervene by e.g., reducing taxes and trade costs hoping to enable the business environment for the situation to change for the better. Events that lead to a virtuous cycle are e.g., the industrialization period which created more jobs and thereby spurred economic growth and development (ibid).

Furthermore, when investigating IS the aspect of cumulative causation is of interest. This to see whether any conclusions can be drawn regarding why the IS is formed the way that it is.

One can map the external dynamics of an innovation by looking at functional patterns. To see the internal dynamics of an IS one shall study the loops of feedback going between functions. The interaction of the function then makes the internal dynamic and ultimately creates cumulative causation (Hekkert et al., 2007).

Suurs & Hekkert (2009) means that through the emergence of cumulative causation the dynamics are the results of events within an IS, together with external influences such as technical opportunities, trends, and historical shocks. They also indicate that the fulfillment of system functions is vital and during the creation of such system functions cumulative causation in different forms plays a role.

An article conducted by Hillman et al. (2008) wanted to investigate and compare Sweden's and The Netherlands development regarding biofuels from a cumulative causations perspective by looking at their respective Technological Innovation Systems (TIS). The idea of inspecting the different countries results by the unfolding of cumulative causation is to see whether specific events in history have led up to each country's different outlooks today, either virtuous or vicious. This to, in a systematic way, be able to compare the respective TIS's the researchers initially determined seven different factors. Identified factors that drove or hampered the development in both cases were: oil supply, local air and water quality, EU agricultural policy, climate change and technology features. Thereafter they mapped out each country's history and highlighted key events, later labeling them as having either a negative or a positive contribution for the development of biofuels. Their findings indicated significant differences between the two countries' development regarding respective TIS. Sweden had at the time of publishing a much more developed biofuel market compared to The Netherlands. By looking at key events related to The Netherlands they could determine that system functions were accomplished sporadically, and that cumulative causation occurred for a shorter period of time in comparison to Sweden. Signs of early cumulative causation could already be seen in the 1990s in Sweden and thereafter each system function had undergone a continuous positive development. The findings proved important lessons for the relevant TIS actors.

4. Method

4.1 Research design

For the conduction of this degree project, a comparative study design was carried out. A comparative study design is the idea of comparing two or more groups, e.g., companies, countries, or cultures, in the attempt to draw conclusions by looking at similarities, differences, and patterns between them. This with the belief that by comparing two or more groups would provide better understanding of the phenomenon through the contrasting of situations or cases. The data is usually collected through a cross-sectional format which also was embodied in this case. A cross-sectional format implies that two or more entities are investigated at the same point in time (Bell et al. 2019). In this comparative study the nations Sweden and Finland regarding their innovations systems and wild berry industry development was investigated and compared in a cross-national fashion with the goal to increase further insight into their respective performance.

For this study we gather information from people about their reality and perceptions on how the IS has formed through its pre-consumptions. Ontology is linked to the structure of being and nature, and studies concepts such as reality, existence, being and becoming (Rawnsley, 1998), it was therefore reasonable to consider ontology to be applicable. Further, we approached the study by different reasoning to create an understanding of the theory and the outcome of our results. Epistemology is interchangeable with the phrase theory of knowledge, insinuating on how humans obtain knowledge. It includes different processes of reasoning when it comes to knowledge such as remembering, believing, inferring, imagining, perceiving, reflecting, corroborating, and constructing. This implies that the chosen research design is connected to philosophical theory since these two branches, ontology, and epistemology, are of importance in philosophy (Rawnsley, 1998).

Regarding this study, the research was initiated when certain “surprising facts" or “puzzles" was discovered within a field which couldn’t yet be explained by existing theories. Thereafter, the researchers sought to find the most likely explanation among different alternatives, which could be done through both numerical and cognitive reasoning. In this study the phenomenon had been predetermined and data was to be collected and processed, ultimately generating theory through finding the best explanation of the phenomenon. The aim was to generate theory through predictions from incomplete observations. This research approach is closely linked to a so-called abductive approach which has the original aim of addressing the weaknesses of the deductive and inductive approaches (Dudovskiy, a, n.d.). Deductive approach develops hypotheses from existing theory and thereafter tests the hypotheses based on the determined research strategy (Dudovskiy, b, n.d.), while an inductive approach investigates patterns from observations to develop theories (Dudovskiy, c, n.d.). Moreover, deductive reasoning has been criticized for lacking in terms of clarity related to the process of selecting existing theory to be tested. Whilst inductive reasoning is questioned since there is a need for enormous amounts of data to be collected to build theory, which still might not be enough.

Abductive reasoning is thus still related to both other approaches since it is applied to construct theory and make logical conclusions (Dudovskiy, a, n.d.). The study is somewhat also connected to the other two reasonings, deductive and inductive. The aim was to be fulfilled by answering, among two more, a question of which country has better preconditions to innovate. The general understanding of facts and theory implies, however not theoretically accepted or intentionally investigated, that Finland is considered to be better on the innovative aspect. Therefore, one could say that the question in mind, with minal adjustments, is hypothetical and drawn from existing statements, facts and theory and therefore a deductive reasoning might have been reasonable. Further, a comparative study intends to identify similarities and differences between its research objectives. It is therefore natural to look for patterns, reflect upon those and draw theory out of the understanding. In this study, patterns were observed, reflected upon and connected to cumulative causation to further understand the patterns impact. The conclusion of this study was based on some of these patterns and it is therefore somewhat inductive reasonings embedded in this study as well.

4.1.1 Qualitative research

A qualitative study can contribute to understanding human conditions of a perceived situation in different contexts (Bengtsson, 2016). According to Bell et al. (2019) qualitative studies focus on how individuals interpret their social surroundings and by that concerns more of words rather than numbers as one would do in a quantitative study. It was therefore relevant to consider qualitative research for this study since we are aiming to understand industry holders and experts' own perspective of a current situation. However, Bengtsson (2016) argues that a perfect study design does not exist due to unexpected events that will change a qualitative studies outcome. As Bell et al. (2019) also mentions, qualitative researchers shall consider that reality is always shifting. Nevertheless, one must create the best possible study design by planning based on what resources that exist such as time, possible respondents, and existing knowledge (Bengtsson, 2016). The process of qualitative research is presented by Bell et al. (2019) in six steps with step five being divided into two sub steps. For this study we have added step 2 again in 5.b, in between the original process of 5.a. and 5.c. to better state how our study will be executed (presented in the list below). This extra step is based on our approach of reworking and adding further sites and subjects based on findings throughout the interview results.

1. General research question to identify the study's theoretical contribution and by that leads to developing the research goal.
2. Selecting relevant sites and subjects
3. Collecting relevant data
4. Interpretation of data
5. Conceptual and theoretical work
    - 5.a. Tighter specification of the research questions.
    - 5.b. Selecting relevant sites and subjects
    - 5.c. Collection of further data
6. Writing up findings and conclusions

4.2 Data collection

Primary data was collected through interviews which will be elaborated in the following sections. Secondary data collection was done by gathering literature and information from scientific articles, relevant web pages and books. The scientific articles were foremost collected through google scholar and the Uppsala University's online library. Some data was provided by RISE in the form of relevant articles and books.

4.2.1 Sampling design

Sampling design refers to the preconditions which the sample was to be judged upon, thus being able to bring the desired result for the specific study. In this case the people interviewed were selected by using a non-probability sampling method. Non-probability implies that the sample of the selected group of participants was non-random and thereby selected on or through certain preconditions (Bell et al. 2019). In this study firsthand data was gathered through interviewees.

The sampled interviewees were collected through purposive sampling, also known as judgmental or selective sampling. This sampling technique refers to the researcher's judgment when collecting participants (e.g., people, organizations, cases) when deciding on who are of interest to the specific study. The aim with purposive sampling is to choose a sample based on characteristics that are of interest to the study to help the researcher answer their research questions. It is an effective method to collect samples when there are only a limited number of sources that can bring valid primary data for the specific study's research design, objectives, and aim. Purposive sampling method also brings the advantages of being both cost- and time-effective for the researchers (Dudovskiy, d, n.d.).

However, within the purposive sampling method there are different ways for how to guide your choosing of samples. For this study, the interviewees were based on a so-called homogeneous sampling method. This purposive sampling technique aims to create a homogeneous sample which suggests that the, e.g., participants or cases all share the same characteristics meaning that they are for instance a group of people with similar occupations or background. A homogeneous method is mostly used when the research question implies certain characteristics on a particular group of interest which is of interest to be examined closely (Lærd Dissertation, n.d.). In this study the samples were selected based on them being a part of the wild berry industry and having a company's perspective in Sweden respectively Finland.

4.2.2 Interviews

Interviews can take the researchers closer to a mirror perspective of reality and can provide an insight into the social world's happenings, and how individuals understand themself, their place in the society and their experience of it (Miller et al., 2020). According to Denscombe (2018) interviews can be seen as the respondents own reporting of their opinions and beliefs. The semi-structured interviews with relevant and already known actors contributed to the study by further identifying more actors and especially how they affect the IS network in different steps.

The qualitative methods consisted of firsthand data collected through semi-structured interviews with the number of interviews being seven. By performing semi-structured interviews, we have been able to get in-depth perspectives of the respondent's understanding and experience of the berry IS, its actors, and who affects who.

In the beginning of the interviews open-ended questions were asked concerning details such as job title, years within the industry and nationality to ensure that the sampling scope was followed. The questions asked to the respondents were in a general form with the possibility to ask further follow-up questions. The follow-up questions allowed us to improvise, making it easier to keep the study aim on track (Bell et al., 2019). A semi-structured interview also enables the researchers to change a question during the process which means that the questions could be different because of information and findings collected throughout the study (Denscombe, 2018).

The interview candidates were first contacted through email and later by phone, ultimately leading to an agreed date and time for the interview to be held. A summary of all interview respondents is shown in Table 5 All respondents were anonymous and the interviews were conducted on either Microsoft Teams or Zoom, this since it is most convenient due to long distances or concerns of the global pandemic. Recording took place with an installed app on our computer since it is most necessary to be able to analyze the interviews several times afterwards. Before recording started it was clarified that all participants had read the missive letter (Appendix A) and felt comfortable to be recorded, this to ensure a safe and trustworthy environment so no negative implications were to affect their answers (Bell et al., 2019).
The interviews were also recorded so that transcription afterwards could take place, this is however immensely time consuming (Bell et al., 2019) and we choose to take help by paying for an online transcription tool which later was corrected a second time by ourselves. An interview guide was made with predetermined questions (Appendix B) concerning the relevant areas to discuss. The interview guide also helped to keep the discussion, during the interview, on the right track and served a purpose to prevent biased, leading, or other potential affections on the interviewer's answers (Bell et al., 2019).

Table 5. Interviewees - Summary

	Roles	Experience	Duration	Country
Interview 1	Wild berry industry expert	-	57 min	Sweden
Interview 2	CEO and entrepreneur	30 years	30 min	Sweden
Interview 3	Sales and purchasing manager	10 years	47 min	Sweden
Interview 4	Managing director	15 years	38 min	Finland
Interview 5	Managing director and industry supporter	-	42 min	Finland
Interview 6	CEO and purchasing manager (two people)	30-40 years	47 min	Sweden and Finland
Interview 7	CEO	20 years	46 min	Finland

4.2.3 Data analysis

The interviews were thematically analyzed to identify patterns in the transcriptions. The meaning of thematic analysis is to see and understand a set of collected data by searching for themes. The themes were identified by looking for similarities and differences, transitions between topics and repetitions (Bell et al., 2019), which is suited for the aim of this study to compare an IS in Sweden respectively Finland. The themes provide understanding for the data which can theoretically contribute to found literature and the research focus (Ibid).

To answer the differences and similarities and respective facilitating and hindering factors between two countries' industry IS. The analysis is to be executed in three steps including 1. thematic coding into subcategories, 2. placement into a pre-established scheme of actors and factors from the performance matrix, predetermined throughout literature studies and based on theory by Woolthuis, Lankhuizen & Gilsing (2005) (further explained in the theoretical framework chapter 3.3), and 3. compare and analyze with further literature studies. The interview from relevant stakeholders (e.g., industry representatives, researchers, educators, etc.) is summarized and divided between findings from Sweden and Finland.

At first, the data provided from interviews was analyzed to identify actors within the wild berry IS. The actors were identified by thematic analysis where the coding went from concept into themes, which lastly related to a specific predetermined “actor-category”. Next, we aimed to identify factors. The coding was conducted in the same manner, from creating concepts into themes ultimately relating to predetermined factors.

Next step included the coding results to be compared with empirical findings to conduct the performance matrix. Each actor and factor found throughout the thematic analysis and empirical study was evaluated according to its repetition, apparent importance, and its experienced impact on the wild berry IS. In Table 6 an example of the coding process is presented.

Table 6. Thematic coding, example.

Transcript	Citation/Code	Concept	Theme	Factor /Actor	Lit.rev
Reading	"And so, these associations are very, I think, important for the small companies that don't have resources to look for all these opportunities"	Important to have access to knowledge and fundings.	Resources	Capabilities	According to literature…
	"Many companies that are in the start need a lot of support and access to knowledge from voluntary associations"	Small to medium sized companies in need of support from associations.	Startups/ Associations	Companies/ Third parties	

The third step was to conduct the performance matrix, one for each country. The matrix contains all the relevant and important actors and factors within the wild berry industry and its IS network that have been identified during literature studies. Further on, the matrix contains different and relevant actors and factors that can facilitate or hindrance the wild berry industries. The matrix result will be the foundation for the comparative analyses to determine the differences in the respective countries' IS concerning wild berry industries. Table 7 shows an example of the placement within the performance matrix. All results in terms of identified factors and actors were presented in the chapter of result and analysis as positive or negative. However, only the topmost important areas were included in the discussion as a limitation to preserve relevance of the study. The identification of the most important areas was done by evaluating according to a point system of 1-4 where 1 was least mentioned and 4 was mostly mentioned and perceived as most important. The areas with points of 3 and 4 were those included in the discussion and further evaluated in functional aspects through literature studies.

Table 7. Performance matrix execution, example.

Factors / Actors	Consumers	Companies	Suppliers/ Labor	Knowledge Institutions	Third parties
Soft institutional					
Hard institutional					
Infrastructural factors					
Interactional • **Strong Network** • **Weak Network** • **Interactional Network**					
Capabilities factors		**Hindrance 3 points**		**Facilitates/ Drivers 4 points**	
Market structure factors					

4.3 Quality analysis

A quality analysis was conducted to ensure the quality of the outcome of this study. Quality of a study is secured through creating authenticity and trustworthiness, as well as ensuring that ethical aspects are taken into consideration (Bell et al., 2019). How authenticity (i.e., reliability and validity) and trustworthiness (i.e., credibility, transferability, dependability, and confirmability) is guaranteed was confirmed in this chapter.

4.3.1 Authenticity

Authenticity is ensured in qualitative research through reliability and validity.

Reliability

Reliability concerns the aspect of the study's ability to be replicated, as well as addresses the question whether research is using consistent measurements so that the results are coherent. Measurement reliability is determined through three prominent factors which are stability, internal reliability, and inter-rater reliability (Bell et al., 2019).

The performance matrix applied to the study has been used on many occasions (see chapter 3.3) ensuring stability in the measurement. All data collected was analyzed using the same index for reliable results as well as ensuring that the data collected through interviews was translated in the same manner. Later, concerning the coding of the interviews a common method was used among the two researchers to ensure reliability throughout the section of coding as well as the analysis. However, the section of coding was divided by the two researchers and was later not "approved" or double checked, as has been in all other areas of research, by the other researcher, leading to that the coding might not have been consistent throughout the result chapter.

Validity

The measurement of validity in research refers to whether a measurement of a concept really measures that concept in question. E.g., people can sometimes argue if a person's IQ score really measures that person's level of intelligence, thereby questioning the validity of an IQ test. There are several different ways to test measurement validity, these are through; face validity, concurrent validity, predictive validity, convergent validity, and discriminant validity (Bell et al., 2019).

To bring validity to this project convergent validity was applied which implies on different types of measurements measuring the same concept (ibid). In the study this will be conducted by using both literature studies as well as interviews which ultimately brings information from different sources on the same matter. If both methods indicate the same results the study can be concluded as being valid. However, due to the limitation applied for this study choosing to only compare companies, lack of validity concerning other actors' reflections, is of consideration. To further ensure validity to an even higher degree more interviews could have been conducted.

4.3.2 Trustworthiness

An alternative criterion to ensure the quality of a qualitative study is through trustworthiness. The criteria were developed since it was believed that the simple application of reliability and validity was not enough for the complexity of qualitative research. This since reliability and validity presupposes that one absolute truth of social reality is feasible for all occasions which is believed to be incorrect. The concept of trustworthiness includes four aspects which are: credibility, transferability, dependability, and confirmability (Bell et al., 2019). The aspects will be further explained and evaluated through the outlook of this study down below.

Credibility

Credibility is an important aspect of trustworthiness since it determines the research acceptability towards others. If research has credibility, it ensures that findings have been carried out in good practice and that research has been handed out to the members of the social world in question, thereby ensuring that the researchers have understood that specific social world (also known as member validation or respondent validation). Credibility can also be

created through triangulation which involves the process of cross-checking findings whereby sources are checked against each other (Bell et al., 2019). For this study, good practice was ensured through handing out a missive letter (Appendix A) to the interviewees in advance together with a brief introduction to the main subject of the study. This, to ensure all interview candidates were notified about what to expect from the interview as well as what the collected data is going to be used for. The study progress and data were continuously discussed by the social world in question, which are in this case the people at RISE and the FINEST project who are much familiar with the wild berry industry in Sweden. However, due to lack of time the report will not be proofread by the interviewees before publishing. This might have been of significance since there is a possibility that the information given by the interviewees to the researchers could have been misinterpreted therefore leading to an invalid conclusion. Cross-checking throughout the study was carried out since data was collected through both literature studies and interviews.

Transferability

The concept of transferability relates to what extent that the findings can be useful and applicable to people in other settings. Transferability can be provided through thick descriptions of necessary data in the research (Complete Dissertation, 2016). The study contributes by showing an example of how to investigate an IS within smaller or more narrow industries by simpler approaches. Both results and discussion can be assumed to be useful, inspirational, and applicable in other settings of similar nature. However, a wider part of findings, in terms of literature, might be limited to the extent of wild berry industries.

Dependability

The concept implies that the study should be able to be replicated and thereby have all information needed for other people. This can be created through an inquiry audit which requires a review and examination of an outside person (Complete Dissertation, 2016). To achieve dependability a well-developed description of the methodology as well as its relevant context has been provided. This to help future researchers to reproduce similar studies if desired. Nevertheless, the coding section was quite individual and might be difficult for people from the outside to replicate in the same manner. The study has also been reviewed by a supervisor both via the University of Uppsala and RISE, and later approved by the examiner.

Confirmability

Confirmability refers to the degree of neutrality in the study's research findings. I.e., meaning that the findings of the study will not be influenced by the researcher's personal motivations or any potential bias, but completely based on the participants' responses. To establish confirmability, it is of importance to not distort what is interpreted from the participants to fit a certain narrative and thereby hinder the creation of being biased. This can be accomplished by the researchers providing an audit trail where every step of indications of how the researchers have implemented an objective viewpoint of the findings (Complete Dissertation, 2016). Since the researchers had no specific gain in the outcome of the study there were no results more or less wanted by the researchers, therefore a small risk of being biased. However, it can be difficult for the researchers to stray away from wanting to approve certain interesting

information and thereby searching for other sources to further approve the findings which might lead to distortion or neglect of other findings. To prohibit this from happening the researchers kept on leading themselves back to the aim of the study to hinder a biased outcome. Another risk of bias was the occurrence of rumors or mentioning's (by nonparticipating people in this study) that Sweden (concerning the wild berry industry) was far less innovative and successful compared to Finland. This could have affected the outcome of this study by influencing the researchers' motivational aim of wanting to confirm this. Nevertheless, this risk of bias in this matter was noted early in the conduct of this study and could therefore be prevented to affect the study outcome.

4.4 Ethical stances

Ethics, focusing on research, handles questions concerning what the nature of the research is and what the personal conduct of the researcher is. The Swedish research council is assigned to draw attention to ethical concerns and inform about good research practice. Following are some principles that form the basis of good research practice when involving people in the study as well as an explanation of how these principles were applied (Vetenskapsrådet, 2002).

- **The information requirement**
  The researchers must inform the participants in the study about their task, what the research intends to investigate and the conditions that apply to the participant. It must be clear that participation is voluntary, and that each person has the right to suspend their participation at any time. Before each interview meeting we have told each participant what our study aims to investigate and the purpose throughout the conversation as well as a written missive letter (Appendix A) sent by email before the interview.
- **Consent requirement**
  The researcher must obtain the person's consent to want to participate throughout the whole study. All participants have confirmed their willingness to participate through email and/or verbal notice.
- **Confidentiality requirement**
  The researcher must sign a commitment of confidentiality when handling sensitive information that affects identifiable persons. All information that is documented must be stored in such a way that individuals cannot identify participating persons. This requirement is noted in the missive letter and all participants had the choice to be anonymous. After the study has come to an end, all personal information shall be destroyed or stored in a secure and proper way.
- **Utilization requirement**
  Information collected during the project may not be used or lent for commercial or other non-scientific purposes (ibid). This requirement is also noted in the missive letter (Appendix A), signed by the researchers to ensure that all collected information shall not be used for anything other than the intended study.

5. Results and Analysis

This chapter will contain an account of the data collected throughout the secondary data results (chapter 2) and interviews that are based on the findings revealed during the thematic coding. Further, the result and analysis aim are to identify actors experienced reality within the wild berry industry and to identify what actions are considered to be facilitating or hindering development. The chapter 5.1 will be the foundation for the performance matrix presented in chapter 5.2, which further will be compared between the countries. The performance matrix will be based on interviews and literature to ensure a relevant as well as a fact-based matrix. The results will then be discussed and concluded in the next coming chapters to clarify areas of importance, relevance, and true meaning.

5.1 Factor analysis

This section of the report will be presented from the respondents' point of view and provide further analysis of how the findings were concluded to relate to each factor under each actor. The results will also state some relevant citations hand-picked from the thematic analysis. Included, a so-called positive and/or negative aspect will be presented with the purpose of clarifying what aspects have been presented in the result. It is of highest importance to clarify that the presented result is based on the interviewees' responses and are therefore not corrected according to confirmed facts, this will later be discussed in chapter 6. The findings have been separated to represent each country, initiated with the findings in Sweden and subsequently Finland. Below you can find a table of content to help you navigate faster in the first part of the results chapter.

Table of content: Factor analysis

5.1.1 Sweden

Demand

Presented below are the factorial aspects of demand in the wild berry industry. Most of them are positive concerning the demand for current products and meeting customer needs. However, there are difficulties creating new demands and knowing what the customers need.

Demand - Sweden

	Facilitators	**Hindrance**
Soft institutional	Consumers bring inducement toward businesses and have a demand for berries and their exclusivity.	Consumers attitudes toward berry picking in Sweden seem to be more on the negative spectrum when compared to Finland's.
Capability	Creating more products to meet demand.	No concentrate facility to make juice in Sweden due to lack of demand.
Market structure	Sweden has more international customers however demand increases over time, especially among younger generations in Sweden.	There is a lack of marketing and knowledge in what the consumers actually want in Sweden. There is a need for them to market their berries more informative to enter the same market levels as other countries.

- **Soft institutional**

The respondents expressed having quite a positive outlook on the consumers through their support and wanting to meet their desires. They see that berries have established quite a good reputation among the consumers and that there is a demand for it, as well as them wanting the berries to be produced locally since they want to support nearby businesses. They provide the companies with incentives for bringing them good products and are described as the main reason for the respondents to be in the business.

"The customers are what is most important and brings the most joy." - *I2*

This enlightens the industry with valuable tools to help foster the development of the industry. However, it is not in the hands of the consumers to help create innovations for the development of the industry since they do not always know what they want or need. They can only provide encouragement toward a better business.

Nonetheless, the Swedish people seem that they would on most occasions not consider picking berries themself and are not willing to pay large amounts of money to get them either. It appears the line is drawn there for how much they value their berries. Some respondents refer back in time to when it was more common to pick berries for their own households. However, in Finland there seems to be a shift in the mentality when it comes to berries.

- **Capability**

The physical infrastructure associated with the wild berry industry in Sweden is without a juice concentrate, which ultimately forces the berries to travel longer distances for companies that desire to produce juice to make sales. The berries must travel from the picking and cleaning site etc., to a facility in another country to make the juice concentrate, and ultimately back to Sweden for consumer sales. This might be the result of a lack of demand in that department of the industry, therefore, not making a juice concentrate in Sweden profitable enough. A consequence linked to this occurrence is that it makes it even more difficult for Swedish berry companies to develop since it is lacking in the aspect of having a well-established infrastructure associated with the wild berry industry.

This can be linked to the capabilities factor since it refers to the country's ability to handle and adapt innovations.

- **Market structure**

According to the interviewees they have noticed an increased demand over time as well as an increasing demand among younger consumers. In recent years, the respondents explained, there has been a movement of wanting to eat and live a healthier lifestyle which has been more apparent among the younger population. Wild berries are considered to be healthy for humans in many aspects and therefore be on the rise for an increased demand if the trend continues.

There is also much potential for Sweden to further enter international markets while making a name for themselves.

"And also, like Sweden is…I don't know exactly, but it could be 20% of our turnover and Finland is like 15-20%. Rest is export. We are selling our goods to more than 40 different countries." - I6

However, according to interviewee 1, there seems to be a lack of understanding regarding what corporations in Sweden think that the consumers, both in as well as outside of Sweden, want when it comes to products developed from wild berries. The respondent had noted that in other parts of the world, more specifically Asia, they develop products that researchers in Sweden have no idea about and make a large profit out of it. These types of products can most likely be produced in Sweden as well, but because of the lack of insight into what the consumers want from the company's side Sweden has fallen short in that department. Nevertheless, it was unclear if he referred to the demand in Sweden or the international market. But it is evident that countries outside of Sweden purchase the Swedish wild berries to make more advanced products such as extracts and powders to sell on the international market. When it comes to marketing Sweden is behind when compared to a country such as Finland.

While referring to positions and relations between the market parties there is much potential for the wild berry industry when it comes to consumer markets. However, there are imperfections in the knowledge market leaving Sweden without the knowledge of what the market wants as well as how to market their berry products.

Companies

While considering companies' perspectives relating to factors facilitating or hindering the development of innovations concerning the wild berry industry, soft institutional, hard institutional, strong, and weak network, capabilities, as well as market structural factors have been referred to. All factors have been related to negative aspects as well as a few positive ones concerning capability factors and the market structure factors.

Companies - Sweden

	Facilitators	**Hindrance**
Soft institutional		Marketing of berries in other countries is more successful. Normative conditions are typically negative within the industry for newcomers.
Hard institutional		Exploiting usage of Swedish berries when in fact most of them are from other countries.
Strong network		No further development since the innovation of freezing houses and lack of innovative product producing companies in Sweden.
Weak network		Need of alliances in Sweden to create a better understanding of demand and possibilities, also to create more knowledge and foster innovation.
Capability	High capacity within Swedish utilizing companies and historical demand created change.	Most utilizing companies have other suppliers creating a more complex industry
Market structure	International demand is high; however, Finland seems to market their berries more successfully.	Production has changed over time, but the product has not, and international competitors offer more advanced products than Sweden. There is also a history of exploitation of foreign berry pickers in Sweden.

- **Soft institutional factors**

In the industry of berries there seemed to be a strong culture of "business has always been done this way" as well as people within the industry having created a set standard where you needed to be in the business of wild berries for a certain number of years to be able to have a voice in the environment and to be taken seriously.

"I'm probably one of the younger ones (~50 years old), so to speak. Otherwise, it is mostly 60–70-year-olds. (...)You have to be in this business for 20 years before you can express your sayings" - I3

It was also expressed that Finland has had a better marketing strategy regarding their own wild berries creating a culture in the country where you want to eat berries regularly to stay healthy. The Finnish people see a much greater value within the berries, thus creating a strong bond as well as them wanting to preserve their wild berry industry. Their marketing strategy has also spread to other countries, presenting Finland as a country with berries as one of their main resources and expressing its many health benefits. This is most evident in many Asian countries where they praise the Finnish berries. Sweden has unfortunately fallen short in this department and not created this norm of "Swedish people eating berries regularly to stay healthy", thereby losing potential value within the consumers, ultimately leading to less operations to foster innovation or development.

This concept has been placed as a soft institutional factor since it describes the very essence of how norms and values may increase or decrease the development of a market which is what the factor suggests. It is possible that since the culture revolving around the Swedish berries does not have the same positive outlook on this resource as it does in Finland, a resulting aspect is that the industry has not been given the same type of interest and therefore investment.

- **Hard institutional**

Swedish companies wish to label themselves, or the product, as only utilizing Swedish berries. However, Swedish originated berries are often more expensive ultimately driving up the price on the end product or lesser profit margin. But because of the lack of regulations, the companies can keep away from prerequisites and label themselves as only utilizing berries from Sweden, but only a smaller percentage of the berries are actually from Sweden.

They only need to have just the right amount of Swedish originated berries to successfully put the label on their end product, then the rest of the berries originate from countries such as Russia, China, Ukraine, etc. This, resulting in companies exploiting the value of only having real Swedish berries in their product when in fact that is not the case. Trading often occurs and the berries are mixed, thereby losing the berry's original origin.

"This producer might buy a car with lingonberries from Sweden that is maybe 10 kroner more expensive, but hopefully we have at least the social conditions here in Sweden. But those who come from Russia, come from China, we do not know. And then you buy maybe thousands of tones from there and then you buy 20 tones from Sweden, but you can still use this designation of origin." - I3

How this is referred to as a hard institutional factor is since it implies the lack of legislation regarding the importance of declaring the true origins of the berries. There is a lack of support toward the usage of Swedish berries.

- **Strong network failure**

It has been noted that Sweden in a way halted their development in the industry of berries at developing freezing techniques. After that innovation, not much has happened regarding the wild berry industry. However, in other countries the industry has continued its progress, leaving Sweden to fall behind.

"What is missing is the processing industry in Sweden, we never see it. Very few [in the wild berry industry in Sweden] know how it works as it exists only in other countries." - I1

According to the interviewees this has led to a lack of producing companies in Sweden. This is caused by actors being closely linked to one another causing nearsightedness and difficulty in forming new ideas, hence strong network failure, leading to the industry not developing in the manner that is desired.

- **Weak network**

Between the intermediaries there is a lack of cooperation between them, ultimately creating a need for alliances in Sweden for the industry to be able to develop further.

"If we could link it to a prominent industry and not have so many intermediaries in the form of wholesalers who only raise the price of the product, then we could also compete [with other countries]." - I1

There also seems to be a lack of insight regarding what the consumers want, leading to companies not finding a need for future knowledge development or transparency linked to the wild berry industry. The demand for new techniques and knowledge is not evident within the industry in Sweden, and as a result they have fallen short. Nevertheless, a broader assortment of products has been noticed outside of Sweden making it difficult for them to compete on the global market. According to the interviewees, cooperation from other countries is desired to support their industry to gain traction. It is also evident among the interviewees that companies in the food industry have a responsibility when it comes to using berries in their products to make the market for berries vaster.

Also, to extract berries it is important to have companies that take care of staffing of the berry pickers. This since the pickers are mostly from foreign countries and need assistance to make it as available for them as possible. The aspect of weak network failure implies knowledge distribution facilitating innovations is not evident. There seems to be a culture of us against them surrounding the wild berry industry in Sweden preventing innovations from forming. Weak network leads to missed opportunities when it comes to business collaborations as well as advantages in exchange of resources.

- **Capability**

Positive aspects have been recognized concerning Sweden's capabilities historically. The increased demand has resulted in financial investments and fundings in knowledge toward innovations being made, moving us away from cleaning and freezing the berries by hand. More elaborate techniques for the handling of berries have been created for a more modern industry. However, there is still a recognizable complexity within the process of handling berries which have potential to be even more modernized.

Regarding Sweden's capabilities related to the cleaning and freezing of berries, there are several facilities in the country today that can handle all berries in circulation. This has been a gradual development as a response to the industry's driving forces. However, there is only one company in Sweden who processes berries that also has their own suppliers or berry pickers. It provides them with an advantage and makes the process more fluent. This might want to be adopted by more corporations to ensure more flowing practices.

Capabilities factor refers to an actor's organizational and technical ability where Sweden currently has an acceptable capability of handling freezing and cleaning of berries. However, that is today the limit of advancement when it comes to the wild berry industry in the country.

- **Market structure**

The market is evolving outside of Sweden making a high international demand for wild berries. According to the interviewees, there is much potential to market the berries as something exclusive. If done correctly there is a possibility that a substantial amount of capital can be brought to the industry.

"As soon as you think of Ikea, it's not always about a cheap bookshelf or something like that, it's meatballs and lingonberry jam." - I3

Negative aspects of the market structure are, much has happened related to the production of berries, however not much concerning the development of products. Therefore, a lack of knowledge of the market demand is apparent. Swedish companies do not know what the market wants and therefore has not created any new groundbreaking products in recent times. Nevertheless, the international competitors have a much wider assortment of products making them more attractive toward consumers in comparison to Sweden's supply.

The wild berry industry in Sweden also has a dark history of exploiting and taking advantage of foreign berry pickers. This, however, does not only apply to Sweden but is evident in Finland as well and has caused a threat to the extraction of the raw material, berries.

"The biggest threat is labor, and labor linked to… the social conditions we stand for. (...) What is happening is many in the industry take money (from the laborers), unfortunately, in various intermediaries." - I3

The presented concerns all fall under the factor of market structure since they are results of the market parties' positions and relations toward one another. The negative aspects mostly refer to the imperfections in the department of knowledge as well as transparency.

Suppliers/Labor

The prospect of Supplier/Labor comes foremost in negative terms concerning soft institutional, strong network as well as market structure. Positive aspects are stated under capability where berry quality and volume are in focus.

Suppliers/Labor - Sweden

	Facilitators	**Hindrance**
Soft institutional		Picking berries is expected to be cheap.
Strong network		Same way of providing labor the last two decades and uncertainty whether foreign workers wish to come or not.
Capability	The raw material is high in quality and Sweden can provide high volumes.	The unknown number of berries that shall grow in the forest creates resource uncertainty.
Market structure		Legislation regarding labor makes the end product more expensive.

- **Soft institutional failure**

There is an expectation that labor regarding berry pickers should be cheap. Cheap labor shall give higher revenues but with multiple handlers in between the most values comes from utilized and processed products in other forms that just a berry.

> *"In Sweden, we Swedes believe that berry picking is something that must work and that it should be very cheap berry picking. It's so that you can make money in the next stage, but you make the most money out of these pill products"*

The soft institutional factors involve the aspects of unwritten norms, values and rules often defined by culture, hence why the interviewees refer to the expectation among some, that berries are cheap in collection and becomes perplexed when labor legislation increases the berries total costs for the suppliers.

- **Strong network failure**

Often companies hire pickers from staffing companies, it has been that way since around 20 years back. Few have their own staffing solution with pickers hired through their own company. It is uncertain each year if the berry picker wants to come or not. Most berry pickers come from Thailand and have done so since a decade back, however interest from other countries has occurred, but Thailand is forecast to be in the picture further on. Reasons for the uncertainty are based on complex systems, more profitable work in other countries and indifferent working conditions in the past.

"Since the last 10-15 years, maybe 20 years, you often work with staffing companies from abroad and so on"

"Are the pickers willing to come or not. And in long term"

The strong network result tended to be seen as positive among the interviewees, as a relation that has been carried out for a long time with the Thailand pickers and always provided in good fortune. There were however repeated times where uncertainty was expressed as whether their long-allied pickers were to come or not, hence a result of strong network failure due to the actors being too closely linked to a business relationship, making it difficult creating new, more, and better relations to ease their uncertainty of labor scarcity.

- **Capability**

Sweden has high quality berries and delivers high amounts usually, however, some years have been bad. It is always a risk with how much the forest will provide. Companies have chosen the strategy to supply the world market and invest in high-capacity facilities, high amounts and products (berries) with high quality.

"But today there are always high levels and there is good quality here"

"We don't know what will be the growth. It can be good, it can be poor, it can be totally poor or whatever"

The minority of positive aspects regarding the supplier area concerns capability since the organizational ability to handle the attractive berry is considered high in both capacity and knowledge. The berries are well handled to store quality and can foremost be delivered in high amounts as long as good seasons and labor can be expected. At the same time uncertainties concerning what level of capacity will be possible is based on unknown raw material levels.

- **Market structure**

The labor market for berry pickers is becoming more expensive and the interviewees believe there are higher risks concerning the matter. The labor rights led to higher costs and expensive end products.

> *"This local, national legislation, we see that in Sweden, for example, it's becoming more expensive, we have to take more risk and higher cost for the raw material to cover the costs"- I6*

The legislation concerning labor rights is considered to become a market risk factor when prices are forced up leading to a high value product that must be negotiable to meet customers' price demand. The supplier actor finds themself in a market structure failure when relations and positions in the market are of highest concern when dealing and trading with the berry price.

Knowledge institutes

Factorial aspects regarding the actor knowledge institutes are presented as negative concerning the capabilities factor and market structural factor.

Knowledge Institutes - Sweden

	Facilitators	**Hindrance**
Capability		Need for more education to facilitate capability.
Market structure		Needs more knowledge to provide more innovations.

- **Capability**

According to the respondents, support from knowledge institutes seems to be insufficient for a flourishing industry.

> *"There is a need for education linked to the industry." - I2*

> *"One [in Sweden] thinks of the forest as forest training and everything. So why not have a berry focused program in schools?" - I3*

More emphasis from the knowledge institutes is being put on other similar education programs, however, education linked to wild berries seems to have been forgotten and there is much opportunity for it to become more adequate. The respondents expressed the absence of education in the field for it to be a more innovative industry.

This negative aspect connects to the capability factor since it refers to the technical and organizational ability for actors, in this case knowledge institutes, to handle and adapt innovations. There seems to be an insufficient number of resources being put toward development in the industry leaving it on the sidelines.

- **Market structure**

Over time great innovations such as the technique of freezing berries have boosted the market structure between parties relating to knowledge institutes. This helped the industry get where it is today. But since then, not much has happened on the national market of Sweden when it comes to innovations and development, leading to the region falling behind in relation to neighboring countries. The aspect is connected to market structure since it refers to positions and relations between the market parties not being formed in the most profitable way. There are imperfections in the "knowledge market" as well as a lack of transparency for innovations to flourish.

"Innovation is important. It is extremely important for this to be at the forefront and that is where Sweden is behind." - I2

Third party

Third parties in Sweden foremost concerned governmental areas in negative terms with several comparing's with Finland's government as a vaster supporter.

Third Party - Sweden

	Facilitators	**Hindrance**
Soft institutional		Governmental support is experienced as limited and believed to be based on norms in the overall society.
Hard institutional	Collective agreements are considered good, and every worker's rights are important.	It is agreed that laws protecting foreign workers are important but must be customized to the specific industry to what holds all parties' interests at its best. Governmental support is experienced as limited and inadequate with further strict laws that hindrance opportunities and development.
Infrastructure		Lack of institutions in Sweden, high hopes on the engagements in RISE.
Market structure		Parties within the wild berry industry experience some governmental actions to specifically facilitate or hindrance a certain industry.

- **Soft institutional failure**

The government or authorities in Sweden are experienced as a less supportive actor in terms of interest. It appears as a lack of normative initiatives where Finland has for a longer time invested more in the social groups' values of the berries and its importance for the country's market position and cultural heritage in terms of activity, health and symbolically. The interviewees also experience the lack of flexibility in Swedish government's decisioning and refers to the typical Swedish normative rule of equality. This refers to the governmental lack of interest of showing support in one industry and neglecting others.

"But I see in Finland that the authorities, different authorities, really seem to work for their berry industry to work well." - I2

"Sweden is a democratic country where everything should be equal. That was the biggest motivation that they cannot be in one branch" - I6

When decisions are based on norms, values and rules defined by culture, inability for development within operations can occur and are referenced to soft institutional failures. In the interviews it is stated that normative aspects are the endeavor for Finnish governmental interest of showing more support for their wild berry industry.

- **Hard institutional**

Consensus that can be distinguished in the results is the furtherance of labor rights and how it becomes an important aspect for ensuring good working conditions and rights for foreign berry pickers. There is however a contradiction where Finland is considered to do it better with creating an environment with place for more opportunities. The laws for collective agreements are according to the interviewees something that can complicate rather than facilitate in some cases. When arriving as a foreign picker to Sweden a work visa is required. It is experienced as a complex process that has in some cases been assumed as a reason why some choose to go to Finland instead where *only* a work visa is required. Finland also requires a minimum wage, and the picker shall not leave their working time in Finland without the correct amount. While the system of collective agreement ensures the same in Sweden there is however a part of the amount going to pensions which won't be paid out until the worker has reached a certain age. The part of paying a pension is not of concern, however the process of getting the pension to the worker is a complex process that is time consuming, bureaucratic, and expensive since they must hire someone to help them. There is also an understanding among some interviewees that support for this area might not lay in politicians' interest due to earlier events. Such happenings often refer to such being presented in the media regarding berry pickers working conditions and exploitation, which then lead to stricter laws and regulations concerning the matter.

"Finland has no collective agreement…[but] the Finnish government said that now the picker must bring x number of euros home with them" -I3

"But the system of collective agreements gives the picker in Thailand an opportunity to get their money out. But there is no routine to get their pension" - I3

"Seems to be completely different in Finland, I think. It is more "straight pipes" that are applied by the authorities" - I2

"You hire staffing companies and then they are employed and work in Sweden so that here you can be employed as a berry picker" - I3

Furthermore, governmental financial funds are repeatedly mentioned as inadequate. In this area comparison with other countries is once again a typical argument where the experience of other countries being more involved with financial resources for business development. The innovative capacity in countries such as Finland is often referred to as a consequence of getting more support and investment from governments. It is also a matter of governmental interests of sharing and indulging in more knowledge regarding the berries and the opportunities they possess. In Sweden, the interviewees believe that certification for food security within the industry is necessary but also massive and unnecessarily strict. It is assumed that other countries have had it easier to market berries, such as health benefits, due to lighter laws of marketing in that area, according to respondents, something confirmed in research but still not approved to point out to consumers. Some respondents also agree that some companies might have better knowledge of how to market their products with what information that is available to use. Companies and stakeholders from the wild berry industry have shared their concerns and ideas with governmental parties but experienced a lack of supportive response.

"There are some organizations in Sweden., and they do not get the same support from Swedish authorities to run their business and to show themselves to the outside world as Norway, Denmark and Finland do for example" - I3

"In Finland we can tell a little bit more in our packages. But in Sweden, it's very, very strict" - I6

- **Infrastructure**

When it comes to bigger investments for R&D Sweden is experienced as a bit behind other countries. Interviewees believe this is something that has recently been given more attention however later than preferred, since other countries are more advanced and established in R&D and knowledge infrastructure. The infrastructural factor concerns such that it requires high investments with physical infrastructure as a need where the number of financial resources often becomes impossible without the support of governments or powerful enterprises.

"Sweden has had a very weak institute until RISE was formed, before there were a lot of small institutes, but Finland was out quite early with VTT, and which is much larger." - I1

- **Market structure**

Interviewees experience that other industries, such as fish industries or similar, get more customized restrictions and support from governments. The picking of berries is tax free but to a specific amount. When picking berries above these amounts the taxes become complicated in several steps and seem unfavorable to the companies. These tax systems, and especially the recently introduced taxes, are often mentioned as a concern among the respondents and somewhat experienced as a direct and intended mockery for the wild berry industry. The interviewees agree on the governments as the biggest influencer on the Swedish wild berry industry at present and expressed the concern for further changes in laws and restrictions that might make the berry business difficult.

"We have this tax-free berry picking and there it has been very complicated with taxes and the tax authorities, and has been hard on a lot of berry traders, how they do the trade" - I2

"I do not feel that it [the taxes] completely hinders us. But it was a bit close when the last tax changes were made" - I2

Market structure factors are referring to the relations and positions between market parties. Failures can be caused by e.g., monopoly, imperfections in the "knowledge market" as well as the lack of transparency. The experience of being neglected refers to the company's market position caused by a vicious cycle, bringing some to success while others to their knees.

5.1.2 Finland

Demand

The outlook on demand seems promising for future innovations, however concerns about branding of products were raised.

Demand - Finland

	Facilitators	**Hindrance**
Market structure	Possibility to raise prices	The right of branding in better manner are necessary

- **Market structure**

Because of the high demand there is, according to the respondents of Finland, great possibilities to generate a lot of capital into corporations in the wild berry industry. Since the raw material can be picked in the forest basically for free there is still room to raise the prices on the products interviewee number 4 claims. It is all related to the relations and positions between parties in the market.

What is missing in the Finnish market structure when it comes to the wild berry industry is the branding of products to articulate toward the consumers whether or not the berries have been picked under humanly right circumstances. The respondent means that if all parties were on the same page when it comes to making sure good humane conditions were in place, all actors would be more satisfied.

Companies

The actor companies in Finland were referred to as having a transparent culture where knowledge flows between firms, however, it might be difficult for newcomers to get involved with the network. Creation of innovations surrounding berries also seems to be lacking.

Companies - Finland

	Facilitators	**Hindrance**
Interactional	Good cooperation between actors with exchange of resources and knowledge.	Bigger companies are more independent and less in need of support and others outside their own network
Capability		New innovations are needed for berry products, but knowledge of the berries is lacking.
Market structure	Branding the nature brings success	

- **Interactional network facilitator**

Interviewee number 4 expressed their cooperation as being well established in the marketplace with an eminent network surrounding them. This made them feel powerful by them having valuable relationships for them to be able to stay as a competitive force in the industry. Nevertheless, they also conveyed that this aspect might be difficult for new companies to be able to get established in the industry since they most likely do not have the same strong network as a startup corporation. However, now these attributes can be viewed as a positive factor for Interview 4's corporation, it is thus vital for them to not lean on their current relationships too much since it can possibly lead to strong network failure. At this moment in time, it can be considered an interactional network facilitator which implies companies being embedded in strong relationships but are still open for creating new ones resulting in knowledge flowing between firms ultimately strengthening individual and collective capabilities. If their current relationships were to get too strong, meaning that the actors become too closely linked, it could lead to difficulty in forming new ideas and new relationships because of nearsightedness. Thus, it is evident among the Finnish interviewees that they experience a knowledge exchange between firms nationally as well as internationally.

"For example, there have been exchanges with Chinese researchers and so on, and as knowledge has developed in Finland, businessmen have also emerged who have wanted to invest money in new companies in new technologies that have developed." - I1

"I think that the starting point has been that we have very much cooperation." - I5

These corporations are much more advanced in comparison to Sweden processing the berries to create extracts and similar ultimately leading to a more diverse assortment of products. Therefore, while looking at the rate regarding innovations in Finland compared to Sweden, Finland has considerably more which might be a result of this ever-flowing knowledge between actors in the industry.

- **Capability**

For new innovations regarding berries to flourish it is sometimes needed for innovations not directly linked to berries to appear. If these are not in place it can hindrance the new innovations from forming in the desired manner making the new idea fail. With interviewee number 4 the discussion led to the subject of packaging where they mentioned that for some products (based on berries) to have a longer shelf life there was a need for a different type of packaging which is not available on the market today. This product could in today's climate therefore not reach its full potential possibly making it not as successful as it could be. This can be linked to a capabilities failure since the companies do not today have the technical ability to handle this type of innovation. There is also a concern that all companies are probably not on the same level when it comes to the knowledge that they have regarding berries, therefore making it hard for them to innovate.

The current foundation of organizational and technical ability of actors to manage new innovations is not as advanced as the berry companies desire regarding innovative products. For the industry to thrive even more other departments need to get on the same innovative level.

- **Market structure**

Finland has managed to create a better environment for their processed berries and therefore makes it easier for innovations to be established in the industry. This has placed Finland in a better position between market parties leading to a good market structure.

"Finland is doing a better job concerning branding the Finnish nature. So, it's clearly more interesting for Asian clients to buy Finnish origin rather than Swedish origin." - I6

This is a consequence of good relations and positions between market parties since no imperfections in the market knowledge or lack of transparency can be identified.

Supplier/Labor

Supplier/labor was the actor in the Finnish IS that was brought up with most concerns. Worries about hard institutional, strong network, capabilities and market structure factors were pronounced.

Supplier/Labor - Finland

	Facilitators	**Hindrance**
Hard institutional		Lack of berry pickers
Strong network		Finland is dependent on foreign labor to extract berries ultimately resulting in them having a substantial amount of power when it comes to bringing large volumes of raw material.
Capability		Risk for shortages of berries and of labor.
Market structure		Tracking the origin of the berries is difficult

- **Hard institutional**

A topic of interest among the respondents was the uncertainty of knowing whether you would have enough berries each coming year. The hindrance of foreign berry pickers to arrive each year is mostly caused by hard institutional failures such as too strict regulations. It is thereby of significant importance that Finland as well as the country the foreign berry pickers originate from have a swift process of them arriving at the berry picking sites each year.

This aspect is connected to hard institutional factors since it is believed that too strict regulations might be the cause for difficulties in getting labor for berry picking into the country. It restricts the performance of the industry making it quite unreliable.

- **Strong network failure**

All parties in the IS connected to wild berries are very much reliant on the suppliers' work to extract berries from the forests. Since most of the pickers come from other countries it is vital for the entirety of the industry that this process is not hampered in any way. This can be connected to strong network failure since the Finnish wild berry industry has in recent years mostly been reliant on people from Thailand. Since the Finnish industries rely on other parties extracting berries it has caused nearsightedness in the formation of innovations affiliated with picking berries. Therefore, no change has occurred in that department. The current business relationships between companies and the suppliers have therefore resulted in difficulties in forming new valuable ideas and innovations which is the result of strong network failure.

- **Capability**

A consequence of the physical infrastructure of the berry picking sites in Finland as well as the dependency of the forest producing berries, there have been shortages when it comes to berries in 2018 and 2019 according to interviewee 5. This causes uncertainty among corporations where they cannot always anticipate great numbers of materials each year at a set price. It is therefore important to take such aspects into consideration when being part of the wild berry industry.

Respondent number 5 also expressed concerns related to the recent situation surrounding the Russian invasion of Ukraine, this since people from Ukraine are also part of the people that come to Finland to pick berries.

"I don't know what will happen this year because of Ukraine, I don't know exactly how many Ukrainians that come…can come to Finland and I think that they want to pick berries if they are in autumn here too." - I5

These types of uncertainties can consume a substantial amount of thinking power about how to handle the situation by forming backup plans. One aspect of capabilities failure is when not enough time and space is given within organizations toward creating innovations and product development. Since uncertainties are apparent regarding the extraction of berries it is time consuming for industries to resolve these types of issues every year.

- **Market structure**

The market formulation between parties in the wild berry industry can cause difficulties when wanting to track the origin of the berries, this because of the many steps in the process.

"'"Because when the supply chain is very complicated and there are many steps, then you don't know the origin anymore." - I7

Since this aspect refers to the relations and positions between market parties it has been connected to the factor of market structure. There is a lack of distribution of knowledge and transparency along the supply chain ultimately causing problems for industrial development.

Knowledge institutes

The network surrounding knowledge institutes were referred to as positive aspects by encouraging knowledge diffusion.

Knowledge institutes - Finland

	Facilitators	Hindrance
Interactional network facilitators	By interest from stakeholders' knowledge and network has developed	

- **Interactional network facilitator**

For a successful interactional network, finding a balance between a strong network's as well as a weak network's attributes is desired. This facilitates corporations to share knowledge through strong business relationships, and at the same time be open towards newcomers in the industry fostering new ideas and possibilities. While conversing with the interviewees regarding knowledge institutes in Finland, they all had a positive outlook on the matter.

"Finland has invested early in natural products from berries, and its researchers have been training in this field. Researchers have also been able to form international contacts, and research on berries has been hot for many years." - I1

Finland believes that the facilitation of knowledge development has been the reason for a more successful generation of innovations.

Because of the vast network that Finland has created for themselves regarding knowledge development, they have more successfully been able to generate innovations. It is however important that they keep on moving in the same manner as they are currently to not fall into either strong or weak network failure.

Third party

Third parties in Finland mostly focus on governments and associations where collaboration, support and fostering of good trends and norms are in focus. Negative aspects concern areas where laws and regulations are either a bit confusing or too strict.

Third Party - Finland

	Facilitators	**Hindrance**
Soft institutional	Clean nature and early introductions to berries in society	
Hard institutional	Tax free berries to a large amount and taxes are not considered to be a problem.	The berries being organically labeled is important for the companies and consumers, however it is dependent on organically certified forests. New laws are confusing but surveillance and regulation for the berry pickers is desired and appreciated. Some laws are too strict concerning foreign labor, but none wishes the same laws as Sweden
Interactional network facilitator	Funds are experienced as gratifying and associations keep the network together.	

- **Soft institutional**

A common trend among the Finnish interviewees was the high valued nature. It was not just admiration and the expression of the importance of keeping nature clean, but also hopeful beliefs that it will be so in the future. Clean nature is expressed as important since berries must hold a certain quality standard and, within some industries, also making sure it is "*clean*", referring to not being contaminated. One respondent, I4, refers to the Chernobyl nuclear accident which eliminated the possibility of eating berries for 30 years. It is also an appreciated action of knowledge sharing in Finland. Authorities and media are spreading information and encouraging its society to eat a certain amount of berries daily.

"In Finland it starts with berries when you have a baby, and you go to this nurse who tells what's good to eat and good for your kids and it starts in Finland already there." - I4

The values among the Finnish respondents regarding nature falls under soft institutional factors where the constitution of keeping the berries clean characterizes the way business is carried out. The placement under third parties is based on the idea that these conditions are a result of governmental actions in both knowledge sharing and the experience of their role as an environmental gate keeper.

- **Hard institutional**

The laws and regulations concerning foreign berry pickers are a topic of both positive and negative concerns in Finland. In contrast to Swedish respondents the taxes are not considered problematic since large amounts of berries can be picked before such regulations start to affect the berry picker. However, new laws have recently been implemented making it difficult for new companies with interests of hiring berry pickers to get clearance due to complex regulations and permit applications. It's desired to have stricter laws and surveillance regarding the berry pickers environment while working in the country. This desire for strict laws is an insurance to create a desired work opportunity in Finland which hopefully results in less concern regarding potential labor shortages. Even though governmental actions are appreciated in the labor matter, few wish to see the same solution that Sweden has chosen and most already believe that the Finnish laws are quite strict and fulfilling as they are.

"I think it is not a big problem because it has always been the same tax as in most products!"

"So, I think it is good if the authorities keep quite close eyes and quite strict standards."

A negative aspect was however the problematic way of determining whether the wild berries are organic. From a company perspective it is important to be able to mark their products as organic but to do so the area where picked must be organically certified. This was apparently not a big issue before but over the past years the hectare of organically certified land has decreased in Finland, according to some respondents.

"There are some companies who produce very much organic products, and they need organic certified berries and that's one big problem, but we are working with the government about this" - I5

Laws and regulations that tend to be too strict or lacking can hindrance an industry's performance, hence the importance of preserving and regulating further on the berry picking labor matter.

The concern of organic labeling is assumed to be based on the governmental action to further invest in increasing the organic certification of forests and decide upon expedient laws and regulation in line with the wild berry industry's interests.

- **Interactional network facilitator**

Another appreciated action from EU, governments and associations are funds for R&D. The amount or how frequent funds are provided was not known but the experience of getting third party support in terms of financial resources was perceived as positive and facilitating. Project funds are considered most important and crucial for companies' development and especially for companies in their starting point when research and innovative capacity is important. The possibilities of getting access to funds comes in various forms.

Associations with relevant focus are a strong supporter of the wild berry industry creating opportunities, providing support, resources, and knowledge. They are further a strong actor of keeping the network together as they gather companies and stakeholders within the industry creating a transparent and sharing environment, providing opportunities and fosters development. It is believed that these interactional networks and opportunities for resources in Finland is based on the early acknowledgment of the wild berry industry and was treated as an opportunistic market worthy of support and facilitating means. Sweden is mentioned and questioned why such few or no research institutions and network strengthening associations exist.

"Also, from governments but maybe mostly from the EU, the companies can get funding" - I5

"All of these societies and associations represent many of the berry industry partners and they are very active with marketing among the network but also telling about new things, telling about these projects, telling about export possibilities like from Korea." - I4

Strong relations and the action of preserving these networks by sharing opportunities, knowledge and resources is embedded in the interactional network facilitator. The collective capacity is increasing, and the industry is experienced as strong when attention and support is given both vertical and horizontal actors. Further, funds can partly be based on a decision, ruling a certain amount of financial support must be distributed to R&D and therefore partly be related to hard institutional factors as well.

5.2 Results - Performance Matrix

The performance matrix results are stated in this chapter, presenting the point system based on the interviewees experience of the will berry IS. The matrix is divided between the two countries and is presented in one "facilitating" as well as one "hindering" matrix. In each matrix all results are presented with highlights on those resulting in highest points (green for facilitators and red for hindrance) and which will be further discussed in the next coming chapters. The point system presents 1 point to be least mentioned and perceived as less important to all respondents and 4 points to be most mentioned and perceived to be of highest importance to all respondents. The points 3 and 4 are those considered to be of highest relevance to further discussions since the aim of this study is to clarify each country's most facilitating, and hindering IS aspects to then discuss differences and similarities further.

Facilitators found in Sweden with most relevance according to the point system were only related to the actor *demand*, which can be seen highlighted in Table 8, Demand connected to *market structure* were mentioned with most frequency thereby given 4 points, followed by the factor *soft institutional* given 3 points. As for the factor of market structure, many of the respondents saw an increase in demand as well as a hopeful future for the industry.

With new trends they had noticed an upswing in the market and viewed positively on future opportunities related to wild berries. Regarding the factor soft institutional, the respondents viewed norms among the actors in Demand as positive and uplifting for the industry to keep making progress. They provide the other actors with incentives to keep up the good work, however, there is a possibility that the respondents wanted to embellish this aspect since the actor in Demand is what makes them able to stay in business.

Table 8. Facilitators in Sweden according to interviewees.

Sweden - Facilitators

Actors / ***Factors***	***Demand*** *- Consumers - Markets - Large buyers*	***Companies*** *- Wholesalers - Companies small to large size - Producing companies - Startups*	***Suppliers/ Labor*** *- Berry pickers - First hand suppliers of berries*	***Knowledge Institutions*** *-Universities - R&D centers*	***Third parties*** *- Governments - Municipalities - Banks and sector associations/ non-profit organizations*
Soft institutional	***3***				
Hard institutional					*1*
Infrastructural					
Interactional Network					
Capabilities		*2*	*2*		
Market structure	***4***	*2*		*1*	

Hindrances in the Swedish IS are scattered in several areas, as shown in Table 9, however most in smaller points of 1 (i.e., not as frequently mentioned or perceived as important). The highest points therefore make a clear state under third parties in relation to *hard institutional factors* and *market structure factors* as well as companies related to *weak network factors*. There is a strong belief that foreign workers need good working conditions while in Sweden, with advantageous contracts. However, the laws and regulations that are supposed to provide such insurances are badly customized and instead disfavors both the industry and the foreign workers. It is further stated in relation to *market structure* that some governmental actions are experienced to actively hindrance potential developments and wild berry industrial growth. The responses related to *weak networks* concerns the feeling of possibilities if Swedish actors were to collaborate more. These factors come foremost in terms of the beliefs that companies need to open and engage in actions that can foster the wild berry sector's development.

Table 9. Hindrance in Sweden according to interviewees.

Sweden - Hindrance

Actors / Factors	**Demand** - Consumers - Markets - Large buyers	**Companies** - Wholesalers - Companies small to large size - Producing companies - Startups	**Suppliers/ Labor** - Berry pickers - First hand suppliers of berries	**Knowledge Institutions** - Universities - R&D centers	**Third parties** - Governments - Municipalities - Banks and sector associations/ non-profit organizations
Soft institutional	2	1	1		1
Hard institutional	1	1			**4**
Infrastructural					1
Strong Network		1	1		
Weak Network		**3**		1	
Capabilities	1	1	1	2	
Market structure	1	2	1	1	**3**

Facilitators discovered regarding the IS in Finland were somewhat scattered as can be seen in Table 10, however the ones exceeding a point of 3 related to the actors Companies and Third parties, both of which concerning the factor *Interactional network*. The respondents referred to the amount of support through funds from governments and associations, and knowledge exchange through their strong business relationships. These facilitating means were mentioned as frequent and continuous from both companies as well as Third parties. These aspects were considered to be important for the historic development of the industry resulting in where it is today, as well as for the future of the industry. This well-developed network was also compared to the Swedish network where the lack of funds was so evident as well as companies being unwilling to cooperate.

Table 10. Facilitators in Finland according to interviewees.

Finland - Facilitators

Actors / ***Factors***	***Demand*** *- Consumers - Markets - Large buyers*	***Companies*** *- Wholesalers - Companies small to large size - Producing companies - Startups*	***Suppliers/ Labor*** *- Berry pickers - First hand suppliers of berries*	***Knowledge Institutions*** *- Universities - R&D centers*	***Third parties*** *- Governments - Municipalities - Banks and sector associations/ non-profit organizations*
Soft institutional					*2*
Hard institutional					*2*
Infrastructural factors					
Interactional Network		***3***	*1*	*2*	***4***
Capabilities factors					
Market structure factors	*1*	*1*			

Even though Third parties in Finland are strong in terms of facilitators within *Interactional network* the factors concerning *Hard institutional* are still notable (Table 11) as the main hindrance. The focus lies in laws and regulations concerning foreign berry pickers, same as in Sweden, however in Finland it is rather about confusion and complex regulations. It is also a frequent mentioning of organic labels which is said to be highly necessary for the company's marketing but experienced as limited due to some governmental actions. The other aspects of hindrance relate to Suppliers/Labor concerning *Strong network* and *Capability* factors. The respondents put high dependency on the foreign workers and are concerned for the risks of labor shortages due to complex laws and bad working environments. They mostly look for solutions with existing knowledge, relations, and resources, however this shows how companies suffer for some narrow sightedness and lack understanding of how to solve and create new relations or solutions.

All the results put in the performance matrix have also been included in the Figure 3 to illustrate the proportion of facilitators and hindrances for the respective countries. A clear difference can be seen regarding the two countries where Sweden has predominantly hindrances while compared to facilitators, where Finland has approximately the same number of hindrances as facilitators.

Table 11. Hindrance in Finland according to interviewees.

Finland - Hindrance

Actors / ***Factors***	***Demand*** *- Consumers - Markets - Large buyers*	***Companies*** *- Wholesalers - Companies small to large size - Producing companies - Startups*	***Suppliers/ Labor*** *- Berry pickers - First hand suppliers of berries*	***Knowledge Institutions*** *- Universities - R&D centers*	***Third parties*** *- Governments - Municipalities - Banks and sector associations/ non-profit organizations*
Soft institutional					
Hard institutional			*1*		***4***
Infrastructural factors					
Strong Network		*1*	***3***		*1*
Weak Network					
Capabilities factors		*1*	***3***		
Market structure factors	*1*	*1*	*1*		

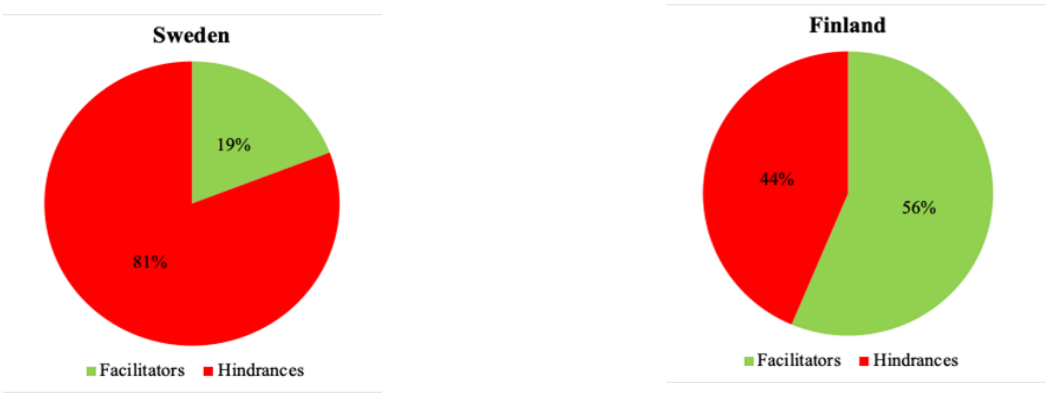

Figure 3. The proportion of facilitators and hindrances in Sweden respectively Finland according to interview results.

6. Discussion

This chapter of the report will discuss the findings from the factor analysis and performance matrix (presented in chapter 5) as well as the empirical background (presented in chapter 2) in relation to the function framework (Hekkert et al., 2007) presented in chapter 3.2. The initial section of this chapter illustrates how identified facilitators and hindrances from respective countries are connected to the different functions defined by Hekkert et al. (2007). Following sections discuss how the facilitators and hindrances have been connected in a critical manner.

6.1 Functional comparison

Figure 4 illustrates identified facilitators and hindrances in Sweden respectively Finland and how they influence function 1-7 (F1-F7). Facilitators have been given a green box with green lines indicating a positive influence for the development of innovations, as well as hindrances given a red box with red lines indicating a negative influence for innovation development.
One facilitator or hindrance fulfills more than one function on many occasions, this is normal according to Hekkert et al. (2007) since one fulfilled function is more likely to fulfill another one creating either a virtuous or a vicious cycle towards innovation and development. Typical starting points for innovation are entrepreneurial activities (F1) leading into creation of legitimacy (F7), or guidance of search (F4) leading into knowledge development (F2) (Hekkert et. al, 2007).

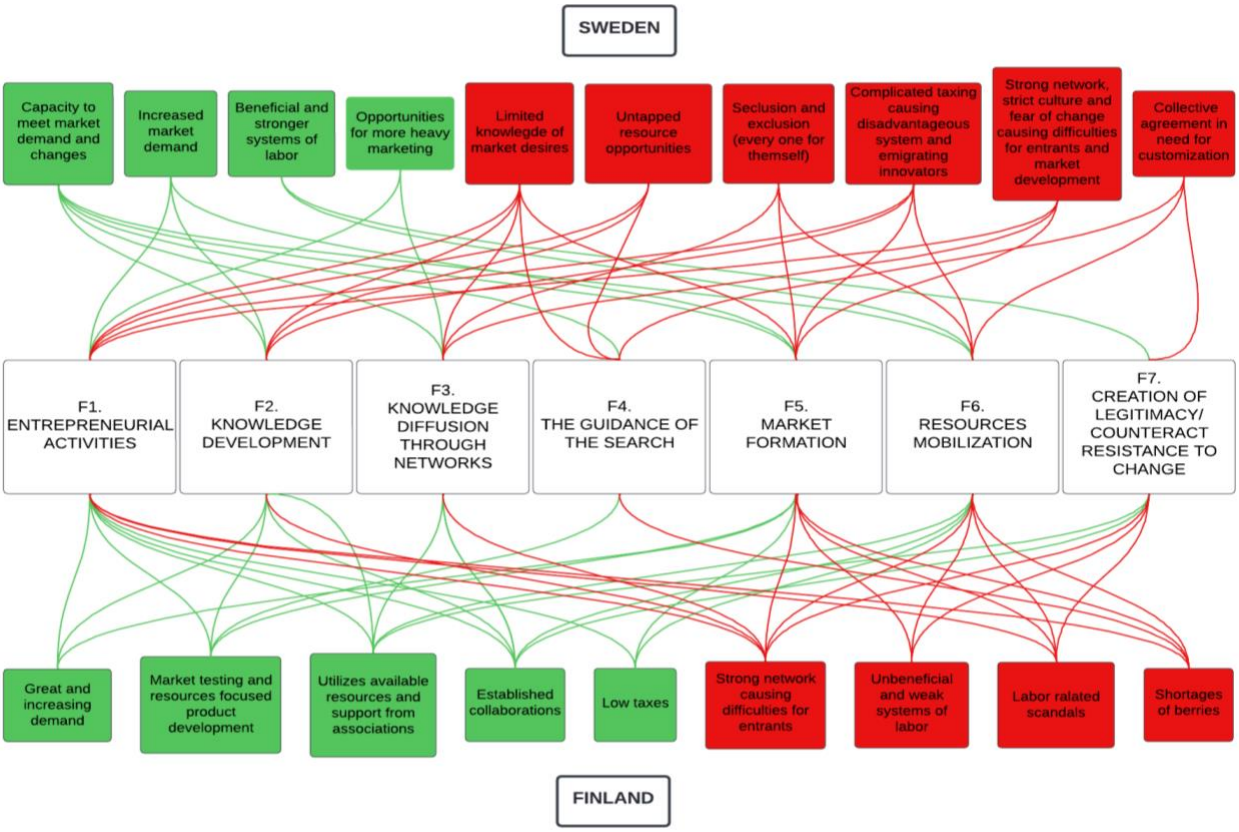

Figure 4. Facilitators and hindrances connected to the function framework.

6.2 Opportunities

While referring to positive aspects found in the performance matrix, when it comes to the Swedish wild berry industry and its IS, the factor *Market Structure* related to the actor *Demand* was most apparent. The respondents related to noticeable trends being formed among the consumers as well as them having a very positive outlook, mentioning wild berries having a reputation of being healthy and thereby contributing to a healthier lifestyle (F1). It is also noted that Sweden has the necessary capacity (F6) to meet new demand and is willing to create more products adapted to these trends. This might be a response to the change of lifestyle since, according to Hörnsten & Lindhagen (2000), there has been a rapid urbanization period in Sweden during the 20th century leading to the population not being out in the forest and wilderness as much. Initially, people were out in the forest picking berries themselves for their own usage. However, nowadays people do not have the same access to rural areas, making it not as convenient for them to gather wild berries. Therefore, people might have taken notice of their today not as equally active lifestyle, according to the respondents, and thereby wanted to compensate by consuming more natural and organic produce as well as leading them back to the Swedish tradition of eating wild berries.

However, it has been noted from the wild berry industry expert respondent (I1) that corporations in Sweden seem to have a lack of understanding when it comes to what the consumers actually want related to the market of berries. This can make one question whether the aspect of "healthy lifestyle" is in fact the reason for the more recent upswing in trend regarding wild berries or if it is something entirely different (F2). By companies missing these important aspects substantial market opportunities might be overlooked leading to a lack of product development (F5) (Hekkert et al., 2007). It is important for companies to focus their resources (F4), share knowledge among actors to increase their understanding (F3) and not get blindsided by the consumers current positive outlook on their product since the market is always growing and developing. Companies can have more power than what's perceived and by that they can also have the power of creating a demand. Nevertheless, while comparing Finland to Sweden, innovative products related to berries are more evident in Finland with companies such as Aromtech (n.d.) creating oils retrieved from various wild berries leaving many further possibilities for the future. The consumption of berries can also indicate that there is a difference in the Swedish and Finnish wild berry market where Sweden consumes 5 kg annually while Finland consumes 8 kg (Jordbruksverket, 2020; Arktiset Aromit, n.d.). This can be taken to suggest that Finland does have a better understanding of the consumer market (F1, F2 and F5).

Consumers many times strive for what they don't have and on occasions, as stated by Larsen and Österlund-Pötzch (2015), people tend to view what once was seen as food for the poor, now to be considered as exclusive. According to Svanberg (2012), people in the poor 18th century Sweden had to turn to wild plants due to the food crisis. Nevertheless, people nowadays prefer homemade food or similar, which most likely is a result of the times we currently live in where impersonal consumption and mass production are the norm, consequently leading to the increased demand for self- gathered berries as Svanberg put it (2012). To sum it up, market

opportunities between the actors' *Companies* and *Demand* seem to be positive with great possibilities for market and knowledge development (F1, F2 and F5). However, the Swedish actors seem quite unsure and timid of trying out further product developments and testing the market in the fear of losing its current position in the market. While Finland tends to have more entrepreneurial activities and a wider understanding of the market formation with the ability to create legitimacy to reform the incumbent regime.

The organic aspects of wild berries do not seem to be of great importance in Sweden since it was never mentioned by the respondents, at least not at the same extent as by the Finnish respondents. Sweden has an organic labeling system, so-called KRAV-certification, but since the wild berries today are quite expensive the line might already have been drawn regarding how much consumers are willing to pay since KRAV labeled products can become more expensive. They might already be taking an extra step towards a healthier lifestyle or buying more exclusive food, the leap might be too great toward indulging in organic produce when it comes to berries as well. However, if more excessive marketing regarding organic wild berries was to be prioritized, the possibilities for a more knowledge based, and vast market could appear (F1 and F3). The respondent view on Finland's market is perceived as quite positive with some beliefs that price can further be raised. Unlike Sweden, Finnish companies put high effort in marketing their products as organic.

Relating to the aspect of price, the topic of organic and locally produced products was also referred to in the next most mentioned positive factor in Sweden of *Soft Institutional* according to the performance matrix. The respondents could see that the actor *Demand* had high values and norms when it comes to berries, wanting the berries to be locally produced and wishing to support nearby businesses. However, they are not willing to pick the berries themselves, leading to foreign workers carrying out the activity instead.

Funds from Third Party actors in Finland are well provided and well utilized by those within the wild berry IS looking to start a company, develop one, or more specifically research on the subject. This suggests that Finland has a successful environment concerning entrepreneurial activity, knowledge diffusion and development (F1-F3, F6 and F7). Some of the respondents do however mention the EU instead of the governments as a more frequent supporter when talking about financial resources. However, while listening to the Swedish respondents talking about funds, it is mentioned as inadequate while compared with other countries saying that their support from *Third Parties* is much greater. They also relate it to funds providing better opportunities toward innovation development with R&D facilities. Nevertheless, the aspect of funds was not a topic brought up by the Swedish respondents to the similar degree as the Finnish respondents. Making one question if, e.g., R&D facilities are something that Swedish companies are interested in, either way they show signs of unwillingness to innovate (F1, F2 and F4).

Food policy in Finland (Mmm, 2016) presents the aims of promoting society's well-being and nutritional status with the vision of having the best food in the world. By 2030 the Finnish consumer shall, accordingly, eat tasty, healthy, and safe food that has been sustainable and ethically produced and shall have the ability to make informative choices. Since the wild berry industry, when looking from a food perspective, is an agricultural industry (Harris & Fuller, 2014) it should be considered in Finland's food policy in terms of the intended objective actions, which one of many are funds for example. The same goes for the European Commission (2022) which also aims to foster and develop agricultural companies. Sweden has also presented a food strategy to tackle e.g., climate change and strengthen competitive ability where diffusion of knowledge and innovation is one of three objectives. Still no such funds can be seen according to the Swedish respondents, at least not in the wild berry industry, therefore other agricultural industries might be more prioritized.

6.3 Network establishment

Some hindrances in the Swedish wild berry IS according to the performance matrix concerns *Weak Network*. The respondents experienced a sense of seclusion from other corporations and especially intermediaries with all the parties only wanting to make money for themselves and not sharing any of their knowledge in between firms. They sensed a feeling of "every man for themselves" and expressed that in other countries it seemed as though further collaboration was taking place. However, it could also be interpreted in the other way around, meaning that the separate parties in Sweden are too closely linked (Hermans, Klerkx & Roep, 2015), a consequence of *Strong Network Failure*. The respondents might want to keep their current customers and intermediaries to such a high degree and have therefore ended up too comfortable with the current situation, ultimately hindering diffusion of resources and knowledge, further development, and innovation (F3, F5 and F6). The expression of other countries having more collaborations and knowledge diffusion within the IS can be due to the high taxation in Sweden. The complicated taxing system in Sweden was expressed at a high rate by the Swedish respondents, declared as ever changing and more excessive compared to other countries. It was also experienced that *Third Parties*, especially the government, put more emphasis on other industries' development (such as the fishing industry) making the respondents feel left out and the excessive taxing system as a mockery toward the wild berry industry. One respondent suggested that the government didn't seem to want to support the wild berry industry, maybe because of the many scandals throughout the years. Covering all these tax related experienced issues, risks for emigrating entrepreneurs may occur along with losses of resources and knowledge that affects the markets long term development (F1, F2, F5 and F6). The scandals might have caused a vicious cycle related to cumulative causation making the industry being viewed as unethical and eventually pushed aside by the authorities causing a negative downward spiral, affecting the whole IS. The amount of *Third Party* support for the IS, while comparing Sweden to Finland is quite different, since in Finland there are two non-profit organizations within the berry sector whilst in Sweden there are none. Since the only actions, which are often experienced as negative, come from governments in Sweden, it is understandable that the respondents feel that they are being pushed around with no other actors having their best interest in mind.

A study conducted by Akcigit et. al (2018) confirmed that high taxation caused fewer innovations in the area affected, with Hedlund (2019) adding that the innovations developed also did not seem to have the same quality as those developed in lower taxing areas. According to the respondents, the Swedish government has advertised the picking of berries as being tax-free with the law of allemensrätten (every man's right), giving out misleading indications since taxation occurs as soon as the sold amount exceeds 12 500 SEK during a fiscal year (Skatteverket, 2022-04-19). These contradictory claims further develop insecurity for the wild berry industry's actors and perhaps also entrants. This might leave entrepreneurial activities moving to other areas outside of Sweden, confirming Hedlund's (2019) description of innovators moving to other countries where innovations provide a more fruitful environment (F1, F2 and F5). This phenomenon of indifferent occurrence leading to more indifferent occurrences, ultimately forming a vicious cycle, can be linked to the phenomenon of cumulative causation, meaning that the cycle must be broken with positive occurrences to make it virtuous (Maritim, 2021).

The first one of two facilitating aspects in the performance matrix in Finland is *Interactional Network* concerning *Third Parties*. The respondents' view of governmental support was perceived as sound and their dislikes mostly concerned areas of berry picking rather than research and development areas. For sure, lack of or too strict laws and regulations can be hindering actions for an IS, but when looking at collaboration to foster the wild berry industries development it was another, more positive attitude in Finland. As a contradiction to Swedish respondents, taxes are not considered to be either hindering or too high in Finland. This, since it does not affect the smaller actors, such as berry pickers, in terms of high economical losses when dealing with smaller volumes or under 15 000 euro per financial period (Vero Skatt, 2021). Resulting in middle hand traders not having to raise prices each time it passes through another actor as in Sweden (F1, F5 and F6). However, some expressed concern for governmental actions to possibly take place that would be similar to the tax and regulation system in Sweden. Even though this concern existed, most respondents rest upon the experience of being heard and that collaboration with Finnish governments is possible to ensure non hindering actions to take place.

There is no doubt that the respondents experienced the Finnish wild berry sector to be a transparent and collaborative national industry. The second facilitating aspect in the performance matrix in Finland is also *Interactional Network* but concerning the actor *Companies*. Both associations and bigger scale companies talk about collaborative endeavors to be the reason why many companies reach success in Finland (F1-F3, F6 and F7). When looking back to the sampling of this study it is however noticed that some respondents in Finland as well as in Sweden might give the appearance of collaborative willingness but in the end do not act on spoken promises, therefore a lack of "younger" companies and startups in this study. In the interview results, smaller companies and startups are mentioned as struggling when new in the industry and trying to enter these networks. This can be assumed to be a reason for some companies' unwillingness to participate in a study as this, since stronger needs of holding information is perceived as necessary.

This is also confirmed by Paassilta et al. (2009), whose study showed high interests for cooperation among wild berry companies in Scandinavia, however these expressions were never taken into action. One can also interpret these claims (by the respondents) to be a confession of bigger companies and established networks to suffer from *Strong Network failure* (Hermans, Klerkx & Roep, 2015) where actors might be too closely linked to one another making nearsightedness preventing collaborative opportunities, entrepreneurial activities, knowledge diffusion and market formation. When looking at Finnish associations there is however a more openness to newcomers. It is confirmed by all respondents that these associations support all who are looking for it, however few mentions whether this concerns network building between new and more established companies (F1-F3 and F5-F7). Deitz et al. (2010) as well as Lundberg and Andresen (2012) mention that collaborative establishments can take a long time due to cultural gaps that need to be overcome. In the results concerning the Swedish wild berry industry, cultural gaps, concerning time of experience, come up as an issue among companies. It is therefore not wrong to assume that these gaps also might affect the Finnish wild berry sector. However, the results of these studies show nothing of such dislikes among the respondents, and one shall therefore consider Finland's wild berry sector to be satisfied with their collaborative opportunities among companies and associations at present.

6.4 Vicious cycles

Another perspective of *Third Parties* in Finland and with a less positive attitude was analyzed under *Hard Institutional* and considered to be the most hindering aspect in the country. These hindrances were exclusively pointed at governmental actions and, as in Sweden, focused on berry pickers. As mentioned in Network establishment, the taxes were not considered an issue in Finland but instead the complex hiring system of foreign workers. However, at the same time many respondents expressed the desire of having strict surveillance from *Third Party* actors to ensure that foreign berry pickers are not exposed to inhumane working conditions while in Finland. Due to scandals and controversies of defraud, lack of rights, human trafficking and inhumane living and working conditions (Wallis, 2020; Lapidus & Engström, 2016; Møller, 2022; Steensig, 2021) that have occurred in Finland, as well in Sweden, it is not difficult to understand why strict laws and regulation been implemented by governments. However, one must question whether it has been done in simpler manners rather than customized to the berry pickers conditions that could facilitate the overall industry focus on core business. Foreign berry pickers must pay their way to work in Scandinavian countries, expose themself to risks of being defrauded, treated unwell and get less paid than expected. An adapted and supervised collective agreement could open opportunities for focusing resources on more innovative areas and recreate legitimacy for the industry (F4-F6 and F7).

Laws in Sweden relating to hiring foreign berry pickers were, according to the respondents, complicating aspects of the industry and its IS. The respondents expressed that the Finnish system of getting seasonal workers did not demand the same high level of requirements as the Swedish did, therefore, making them question whether Finland's system is better. In Finland, the foreign workers do not get involved with an employment relationship, therefore they only need to obtain a certain working visa and can eventually start selling their harvest to companies

in the wild berry industry (Finland Abroad, n.d.). Since regulation in Sweden, according to Migrationsverket (2021), requests that the foreign workers obtain a collective agreement, several additional claims need to be fulfilled as well, ultimately putting more strain on the employers. However, in this comparative study the interviewees only had a company perspective and therefore the view of the *Supplier/Labor* or *Third Parties* (which are two actors that might have been of importance in this matter) have not been collected, making one question whether this is in fact a problem for IS development or not. The respondents might have only noticed the extra working time for obtaining foreign workers in Sweden but haven't noticed that working in Sweden might be more attractive for the berry pickers since they have a more secure working environment. Also, scandals and controversies seem to be more severe and frequent in Finland while compared to Sweden, which might be a result of Sweden's less concern of labor and resource scarcity due to better working conditions provided for the foreign workers (F6 and F7). However, a concern raised by the respondents relating to the collective agreements and its more excessive, or rather unnecessary, aspect was that the berry pickers needed to pay pension with their earnings while in Sweden. Many of the foreign workers might never return to Sweden again after their seasonal work is completed, thereby to obtain their pension extra steps had to be completed which can be hard for someone not knowing the language or who are not located in the country.

Finnish respondents do not wish to have the same systems as in Sweden even though those laws and regulations at least ensure the workers they have rights and minimizes the risks of being deceived. On the other hand, the Swedish system can make the work less profitable due to taxes and more complex regulations that follow with a collective agreement. Further, Swedish authorities might have difficulties to ensure their collective agreements are being followed and therefore also in need of a surveillance system. Finland can however not ensure the same rights as Sweden and, depending on circumstances, offers more but also less profitable wages. A summarized description of IS can be defined as all important factors, concerning such as economic, social, political, organizational, and institutional factors, that influence the development, diffusion, and use of an innovation (Warnke et al., 2016). Therefore, tailoring of collective agreements toward seasonal berry pickers might be an important course of action from *Third Parties* for further simplification of the process. Thereby opening opportunities for restructuring of the IS by removing middle hands, increasing profits, labor opportunities, entrepreneurial activities as well as make space for innovation and focus on the core business alongside better legitimacy (F1 and F5-F7).

The issues concerning foreign berry pickers tended to fall on governments by the respondent concerning both Finland and Sweden. However, few perceived to obtain insight in their own responsibility on this matter. As mentioned earlier, governmental action of complex labor systems seems to have occurred due to previous scandals. The second hindering aspect in Finland is the *Strong Network* within *Supplier/Labor* where the concern for labor shortages shows a tendency of nearsightedness. The respondents expressed their dependency of foreign workers and that fewer seem to choose Finland when going for the seasonal work of berry picking. None of the respondent seems to see any other option than rely on these workers and

suppliers' relations, which can be, according to Klerkx, Van Mierlo, & Leeuwis (2012) and Hermans, Klerkx & Roep (2015), a sign of *Strong Network failure* (F1 and F4-F6).

In most aspects concerning issues on labor, this is also the case for Sweden, Woolthuis, Lankuizen & Gilsing (2005) presented an example of similar failure with the "Overnight express" project where they chose to focus on closer relations with Dutch companies and ignore suggested focus of involving rail companies, customers with interest to use the express train and the European Commission, that was placed under *Hard Institutional* failures. The "Overnight express" project failed due to their focus of strengthening already existing relations rather than putting an effort of turning *Hard Institutional* factors to their advantages by looking for solutions within those factors. It can therefore be reflected upon whether Finland is less capable of finding new innovative ways of ensuring these relations among foreign workers, since they can't see any other way of managing than the same way they always have been. It is however important to state other reasons for the issue on berry pickers in Finland. Under *Suppliers/Labor*, aspects of *Capability* are stating the previous shortages of berries during 2018 and 2019 and then the Covid-19 (Steensig, 2021). These are in place to consider a reason why the experience of few foreign workers has arrived in Finland in recent years. From another angle one can perceive a vicious cycle of cumulative causation, which also goes for the issues in Sweden of inapt laws and regulation concerning berry pickers and taxes. The dynamics that come when cumulative causation emerges, is the result of the events within an IS such as unwillingness to change, nearsightedness, slow development and lack of support and knowledge diffusion. These events go together with external influences (Suurs & Hekkert, 2009) such as the Chernobyl catastrophe, labor scandals, climate changes, the pandemic and so on. All events that somehow have affected the wild berry IS in a vicious way.

7. Conclusion

The aim of this study was to compare Sweden and Finland's wild berry IS in the perspective of companies. The purpose is to contribute with a better understanding of what differentiates Finland's wild berry IS from Sweden's and if there is any IS aspect for each country to consider.

7.1 Main conclusion

The following section will re-state the research questions of the thesis and outline respective conclusions.

1. What factors hinder and facilitate the development of the innovation system around wild berries in Sweden and Finland?

The performance matrix indicates that the factors with most significance concerning facilitating aspects in the Swedish IS are *Market Structure* (4 points) and *Soft Institutional* (3 points) concerning the actor *Demand*. *Market Structure* is based on the respondents' experienced increase of demand, partly based on health and environmental focused trends, creating incentives for the companies and a hopeful view of the wild berry industry's future and its opportunities. Further, *Soft Institutional*, correlates to the previous and was based on the respondents reflecting the consumers norms and values of shopping locally produced products and preserving cultures as well as traditions of domestic food and forest-related activities. Regarding hindrance aspects in Sweden, factors concerning *Hard Institutional* (4 points) connected to *Third Parties* were most apparent referring to complex collective agreements for berry pickers as well as no fundings for development in sight. Followed by *Weak Network* (3 points) relating to *Companies* and *Market Structure* (3 points) concerning *Third Parties*. *Weak Network* refers to *Companies* lacking insight regarding consumers desires and few collaborating occurrences with other corporations, while the factor *Market Structure* refers to *Third Parties* prioritizing other industries.

Finland's most facilitating aspects concerned *Interactional Networks* connected to *Third Parties* (4 points) and *Companies* (3 Points). The respondent referred to collaboration among both actors to be prosperous and that all together contributes to knowledge diffusion, resources and funds for innovation and development.
Finland's most hindering aspect concerned *Hard Institutional* connected to *Third Parties* (4 points) as well as *Strong Network* (3 points) and *Capabilities* (3 points) factors connected to *Suppliers/Labor*. The *Hard Institutional* aspect foremost concerned complex and too strict laws of berry picking labor, leading to difficulties of ensuring resources. This further goes to Finland's high dependency on foreign workers leading to higher risks of shortages in both berries and labor forces. Ultimately resulting in *Strong Network* failures and *Capability* issues.

2. Within the innovation system, does either country have a more fostering environment, within the innovation system for the wild berry industry to innovate and develop? If so, which functional aspects shape these environments?

The conclusion of empirical findings and interviews shows that Sweden has in relation to Finland less facilitators and more hindrances relating to functional aspects in the IS. Sweden has especially less facilitating actor activities influencing the functions *entrepreneurial activities* and *guidance of search* when compared to Finland, which are the most common starting points for innovation according to Hekkert et. al (2007). The functional actions referred to as being hindrances in Sweden are those mentioned in Figure 4 in chapter 6.1, with limited knowledge of market desires, untapped resource opportunities, complicated taxing causing disadvantageous systems and emigrating innovators, strong network, strict culture, and fear of change as well as need for altering collective agreements. These are all actions from several actors in a row that might have influenced and limited the Swedish wild berry industry's conditions to innovate and develop. Compared to Finland, which also has hindering functions in the form of strong networks, lack of berries, disadvantageous systems and scandals related to labor, but instead more facilitating and, above all, exploited conditions. However, it is important to consider that Finland's hindrances in the IS could be factors that can be questioned whether there really is hindering their functional capability to further flourish and that there is the possibility of more unidentified hindrances.

Figure 4 in chapter 6.1 shows how Sweden differentiates from Finland concerning functional preconditions to foster innovation and development. Sweden tends to have facilitated opportunities which are hindered by other actions such as unexplored opportunities and lack of collaborative force. While Finland's facilitators are and have been more utilized to innovate and develop. The hindering aspects in Finland are instead primarily related to vicious happenings and perhaps risky creations of culture. Sweden's hindrances might instead be solvable with correct actions and collaborative force and is a question of willingness to change rather than seek redemption as Finland's future moves might have to focus on.

To say that Finland has better preconditions to innovate would be incorrect, due to Sweden also having good preconditions towards great opportunities within the wild berry industry. It is instead better to conclude that Finland seems to have utilized their preconditions better and more than Sweden and are therefore somewhat experienced as ahead concerning innovative aspects. Even though the way there might be complex and long, Sweden needs to overthrow their incumbent regime of limited and knowledge holding culture to foster a more collaborative and knowledge diffusing environment. Thereby restructure their horizontal network to later focus on fostering the vertical. This can ultimately state that Finland has taken their gold and carries it with them already while Sweden’s gold is still in the ground just waiting to be explored and utilized.

7.2 Contribution

The study was conducted in an exploratory and comparative nature that had the intention of being preliminary research of wild berry IS, with the starting point from a company perspective. This study provides findings that are important for the understanding of the wild berry IS in both Sweden and Finland. The findings could conclude several aspects of each country's IS related conditions and issues that further can be investigated in other industries within the agricultural sector as well as be continuously evaluated within the wild berry industry. It further contributes by showing an example of how to investigate an IS within smaller or more narrow industries by simpler approaches. The performance matrix is an effective tool to complete a study of the IS. There are, however, some aspects that are not covered in these methods and should be taken into consideration. The innovation system approach and its functions does not create any understanding for the reasons to identify conditions. In this study we supplemented this aspect by looking into cumulative causations, which is one suggestion for future research within the IS. Further, either the performance matrix or the innovation system approach does open up for ethical and political reasoning which might constrain the study since nothing, but the researcher's own initiatives, can ensure that.

7.3 Future research

To further investigate the wild berry industry in Sweden, studies like this one could be of interest where other actors such as berry pickers or governmental representatives in the IS should be sampled. This would provide a more elaborate understanding of facilitators and hindrances affecting the wild berry IS. A limitation of this study was that the firsthand data collection was only brought from a company perspective merely providing their point of view. Another aspect of importance is the hindering factor in Sweden of incumbents not knowing what the consumers desire regarding berry products. This, since knowledge resources are scarce in Sweden, a well elaborate distribution of them is therefore vital when introducing new products into the market. Consequently, to provide valuable information to the industry, further research of the marketing, market formation, value creation and knowledge diffusion should be conducted within the area of wild berries.

Further, other approaches when investigating a smaller IS shall be conducted. As mentioned in the above chapter (Contributions 7.2) some aspects are not covered by this study's selected framework and should therefore be evaluated and tested with further frameworks.

7.4 Ethical and social reflection

Throughout this study ethical and social impact has been considered in all steps. Some aspects that have been reflected upon are worth mentioning as an ending chapter in this thesis. At first, data collected from interviews has been handled according to the stated points in chapter 3.4 Ethical stances. To ensure those being followed none of the coding shall be shared in the following appendices. During coding it became clear that the over 140 codes partly contained too much information that could risk exposure of the participants, their company, or competitors. A second aspect worth mentioning is the researcher's reflection upon some

participants' perception of the results or discussion. Both chapters contain conclusions about our own perceptions, with relations to empirical learning in mind, of the respondents' underlying, unintentional and real meaning. It can to some extent create a feeling that quotes are taken out of context or stated at a negative angle. Since this study aimed to compare and create a realistic view of differences, it was necessary to look beyond the context to identify possible obstacles as well as facilitators. Finally, the discussion presents some assumptions about groups whose own opinions have not been heard in this study. For this reason, we have also emphasized the need for further studies in the area with other actors in focus.

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Appendices

Appendix A: Missive Letter

Missive letter

This missive letter is a basis for our master's thesis that we carry out through Uppsala University.

We are studying the last semester of the program industrial management and innovation at Uppsala University. The last stage of the program includes a master's thesis that we will carry out on the initiative of RISE. The aim of the thesis is to identify the Swedish and Finnish wild berry industry's innovation systems through literature studies and interviews. The purpose is to find out what distinguishes Finland's wild berry industry from Sweden's, and whether there is an innovation system aspect to consider as a reason why Sweden innovates less in the field in comparison to Finland. Interviews mean that we will on various occasions conduct studies with gathering of information that people will be affected by in the form of audio recordings and video documentation, after which everything will be deleted as soon as the work is completed. All participating people and companies can choose to be anonymous in the work. We will follow the Swedish Research Council's four main requirements regarding ethics to ensure good research ethics:

1. The information requirement - the researchers must inform the persons participating in the study about their task and the conditions that apply to the participant. It must be clear that participation is voluntary and that they have the right to cancel their participation at any time.
2. The consent requirement - the researchers must obtain the person's consent to want to participate in the project, this applies throughout the project.
3. The requirement of confidentiality - researchers must sign a confidentiality agreement when handling sensitive information that affects identifiable persons. All information that is documented must be stored in such a way that individuals cannot identify participating persons.
4. Requirement of use - information collected during the project may not be used or lent for commercial use or other non-scientific purposes.

The essay will run until June 3.

Felicia Walldén Cerna
Phone
Mail
Signature

Rebecca Markgren
Phone
Mail
Signature

Appendix B: Interview guide

Interview guide

When we are talking about the innovation system in this case we only focus on the wild berry industry. An innovation system in this case is a network of actors affecting the berry industries development in any kind of direction. When we are talking about the actors we look at anyone that can affect, so it can be schools, research institutions, government, suppliers, berry pickers and so on. When we are talking about the factors we are looking for the activities carried out by the actors. The factors can be activities carried out by different actors in different steps or independently by one actor. A factor can be such as a law, norms, education, research fundings or infrastructures.

Icebreakers
Can you tell me a little bit about what you work with?
How far does your experience go regarding working with berries of any kind?
How do you experience the development regarding berry-interested industries?

Wild berry industry experience
What do you think is the toughest part for a company's development with the focus on berries today?
What actors do you consider to be most important for a company within the wild berry industry and why?
If you could improve something within the innovation system concerning the actors (focused on berries), what would it be?

Innovation system - Factors/categories
What factors (legislation, infrastructure, knowledge development/diffusion, entrepreneurial activities) drive or hinder the wild berry industry and its innovation according to you?
How do you suggest the negative factors to be handled?
What kind of factors do you find most appreciated and valuable for the wild berry industry?

Comparison
From what you know, how would you explain the differences between Sweden and Finland regarding berry industries?

End discussion/ Closure
Do you have anything more of interest concerning the berry industries innovation system to share?