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# Learning practices in collaborative open innovation ecosystem

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**Abstract:**

Ecosystems are increasing interest among companies due to today's appreciation towards collaborative environments. Firms are more eager to learn and increase their knowledge by cooperating with partners who might already have the required knowledge. Constantly changing environment requires companies to develop their processes accordingly, which highlights the need for productive learning practices. This study seeks to determine the learning practices in the open innovation ecosystem, focusing on the experiences of the selected case ecosystem.

The two main concepts for this study are ecosystem and organizational learning. First, ecosystem theory is presented by concentrating open innovation ecosystems and companies' collaboration to have clear understanding of the ecosystems. The second concept includes organizational learning which concentrates on creating an overview of learning in ecosystem. These two main concepts will be combined in theoretical framework, which will be the foundation for this study's empirical part.

This empirical study is organized as a single case, which studies the learning practices in the open innovation ecosystem by using 5I-learning model. Five semi-structured interviews were conducted with representatives of the companies participating in the ecosystem. The data collected is analyzed by using the Gioia method. Reliability and validity of the study is represented in the trustworthiness table.

The findings of the study show that learning in ecosystem is a gradual process that starts with the participant's own motivation to join, continues with trust-building with other partners by defining the ways of working and targets that require willingness to be active and finalizes with the process of searching the new, required knowledge from external sources.

This thesis concludes with detailed theoretical implications of the learning process. After presenting the theoretical implications, a short conclusion is included. The thesis is finalized by presenting the limitations and suggesting topics for future research.

**KEYWORDS:** ecosystem; innovation ecosystem; open innovation; ecosystem learning; learning; learning practices; collaboration

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**Tiivistelmä :**

Yritykset ovat yhä kiinnostuneempia ekosysteemeissä toimimisesta, mikä näkyy yhteistyöhön perustuvien ympäristöjen kehittymisestä. Yritykset ovat innokkaampia oppimaan ja kasvattamaan osaamistaan yhteistyössä muiden yritysten kanssa. Jatkuvasti muuttuvat ympäristöt vaativat yrityksiä kehittämään heidän prosessejaan jatkuvasti, mikä korostaa tehokkaiden oppimiskäytäntöjen ja rutiinien merkitystä. Tämä tutkimus pyrkii määrittämään avoimeen innovaatioekosysteemiin sopivat oppimistavat valitun tapaustutkimuksen kokemuksien perusteella.

Kaksi pääkonseptia tälle tutkimukselle ovat ekosysteemi ja organisaatio-oppiminen. Kirjallisuuskatsauksen ensimmäinen osa sisältää ekosysteemiteorian esittelyn, jossa keskitytään avoimeen innovaatioekosysteemiin sekä yritysten rooleihin ja yhteistyöhön tässä ympäristössä. Toinen osa keskittyy organisaatio-oppimiseen ekosysteemikontekstissa sekä esittelee valitun 5I-mallin. Nämä kaksi osaa yhdistyvät teoreettisessa viitekehyksessä, joka on tutkimuksen empiirisen osan perusta.

Tässä empiirisessä tutkimuksessa on yksi tapausesimerkki, jonka avulla tutkitaan oppimiskäytäntöjä avoimessa innovaatioekosysteemissä käyttäen 5I-oppimismallia. Viisi puolistrukturoitua haastattelua järjestettiin ja haastateltavat olivat tapausekosysteemissä mukana olleiden yritysten edustajia. Kerätty data analysoidaan käyttäen Gioia metodia. Tutkimuksen luotettavuus ja pätevyys on perusteltu luotettavuustaulukon avulla.

Tutkimuksen tulokset osoittavat että oppiminen ekosysteemissä on vaiheittainen prosessi, joka alkaa osallistujan omasta motivaatiosta, etenee luottamuksen rakentamisen kautta määrittämään työskentelytavat ja tavoitteet vaatien yritysten omaa halua olla aktiivinen. Prosessi viimeistellään tarvittaessa käyttäen ekosysteemin ulkoisia lähteitä uuden tiedon ja osaamisen löytämiseksi.

Tämä tutkimus viimeistellään esittämällä oppimisprosessin tulokset yhdistämällä ne teoreettiseen viitekehykseen. Tämän jälkeen lyhyt päätelmä tiivistää tutkimuksen tuloksen. Lopuksi esitellään tutkimuksen rajoitteet ja ehdotukset jatkotutkimusaiheiksi.

**AVAINSANAT:** ecosystem; innovation ecosystem; open innovation; ecosystem learning; learning; learning practices; collaboration

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# 1 Introduction

## 1.1 Motivation for the study

The selected topic of learning in innovation ecosystems has been selected, as ecosystems and their functions are increasing interest in the corporate environment. Today, the importance of cooperation is a hot topic and understanding of the networks and their activities has arisen interest. For instance, Business Finland is providing guidance and resources to connect companies with different ecosystems and by that enhancing the importance of cooperation (Business Finland, 2024). Companies are more eager to co-create innovations together with relevant partners and through innovation it is possible to create additional value in a more efficient way. This highlights the importance of understanding how learning occurs in the ecosystem and what kind of practices are required for ecosystem to succeed.

In ecosystem context, cooperation is a necessary element of successful process. As ecosystems are complex, participants need to be ready to develop the processes towards more smooth outcomes and this thesis will study the learning process and investigate how organizational learning occurs in ecosystem. As the most concentration on ecosystem studies has been on the lead firms and their role in the ecosystem (Ates, 2022), this thesis will mainly focus other participant viewpoint in ecosystem who are not in a leader position but have critical role in providing ecosystem the starting points to success.

## 1.2 Research gap and research question

Previous studies have focused more on the actions and processes of the leader firm in the ecosystem and for instance Ates (2022) and Foss et al. (2023) have studied the role of the leader firm. Less focused area are the other participants in the ecosystem and their responsibilities and possibilities when being part of the ecosystem. According to Gibb et al. (2016) studies regarding learning in networks have been concentrating on the

knowledge transfer and how it can benefit the ecosystem, and not on the actual learning process practices in the ecosystem level. Therefore, this thesis tends to concentrate on the role of the participants and their viewpoints through lesson-learned approach towards ecosystem and what are the learning practices in the ecosystem context where co-creation is in the focus.

As this thesis will concentrate on the participants viewpoint and experiences in the ecosystem to understand the learning process and practices of the ecosystem, following research question has been developed:

**What are the learning practices that take place in collaborative open innovation ecosystem?**

This question will provide practices that participants in the ecosystem have stated to be the most suitable and practical for learning in the ecosystem.

## 1.3 Thesis structure

This study is divided into five main chapters and the first chapter provides a short introduction of the topic and presents the motivation for the study, research gap and research question, and shortly introduces the structure of the thesis.

Second chapter of this thesis will include the literature review, which will present the existing literature and research of ecosystems and organizational learning. This chapter includes two main streamlines: Ecosystem and Organizational learning, which are divided into six sub-chapters to provide overview of the existing research of the topics to be compared in analysis phase with the results. This chapter also includes the theoretical framework of the study based on the literature review.

Third chapter introduces the selected methodology and case ecosystem which is used as case project in this thesis. It provides also an overview of the used data collection and analysis methods as well as reliability and validity of the thesis.

Fourth chapter includes the findings of the thesis. The chapter is divided into five sub-chapters, which each present the results in the selected model. Final part of this chapter presents the theoretical framework introduced in Chapter 2 revised with the results.

The final chapter discusses the results together with theoretical implications to compare the results to the previous research conducted. This will summarize the outcome of this study and present also limitations of the research and provide future research suggestions.

# 2 Literature review

Next subchapters will provide theoretical overview of ecosystems and organizational learning and present the theoretical framework of this study.

## 2.1 Ecosystem

Ecosystem as a concept is quite recent innovation and it has been in the centre of interest during the past years, especially in the studies related to innovation and strategy (Felin & Foss 2023). There is not one specific definition for the term of ecosystem, but it can be defined in several different ways depending on the area of discussion (Tsujimoto et al., 2018). Adner (2017) defined ecosystem as a group of individual companies who must cooperate to achieve the value proposition. According to Jacobides & et al. (2018), ecosystem includes interaction between different firms which are dependent on every action the other partner makes, and they have interdependent characteristics that complement each other in the ecosystem. Kohtamäki et al. (2019) explains that value creation between the firms is highlighted in the sense of ecosystem concept. To combine, the core of ecosystem concept is that firms are connected to each other and dependent on each other's actions and resources to be able to succeed with the value proposition (Felin & Foss 2023).

As the importance of the network perspective of ecosystem shows, according to Felin & Foss (2023) the core of the argument is that companies cannot success to do things alone as ecosystems help them to create value and innovation with more certainty. Therefore, it can be said that interdependence is important term when studying ecosystems and their way of working as every partner in ecosystems have a need to connect with each other to get access to all the needed resources (Felin & Foss 2023).

Teece (2007) presented view that firm needs to see its environment as the ecosystem and observe it carefully and be prepared to acknowledge how the environment affects the capabilities and by that improve the capability to increase competitive advantage.

Rules and processes are provided by the ecosystem to be able to determine how the ecosystem will be coordinated and what boundaries it has (Jacobides et al., 2018; Tsujimoto et al., 2018). According to Adner (2017) ecosystem partners influence each other's capabilities and their roles in the ecosystem to adjust towards the path appointed by the central companies. Business ecosystem connects different companies to cooperate and develop their capabilities together, even though the focus is around the focal firm (Cobben et al. 2022).

Ecosystem can be divided into two main approaches: ecosystem-as-affiliation and ecosystem-as-structure. Adner (2017) explains that ecosystem-as-affiliation approach concentrates more to the actors in the ecosystem and how their role is determined by their connections in the network, while ecosystem-as-structure provides more concentration to value proposition and what are the necessary actions to be able to fulfil the value proposition.

### 2.1.1 Ecosystem strategy

Adner (2017) presented ecosystem strategy as the procedure of how the leader firm decides to address the participant adjustment and select its function in the ecosystem. As the leader firm plays main role in creating the ecosystem strategy, it is important to have clear value proposition in mind and be able to imagine how the value will be created by using that strategy (Ma, 2021). This is necessary as the size of the ecosystems usually is large and companies are diverse (Williamson & De Meyer, 2012) which creates a need for carefully determined strategy. According to Ma (2021), ecosystem strategy needs to be able to use its participants competencies in creating its own competitive advantages that will serve the specific ecosystem needs. Hannah and Eisenhardt (2018, p. 3187) define ecosystem strategy “as the firm’s choice of (a) how many and which components to enter, (b) with which complementors to align, and (c) how to balance cooperation and competition”.

Every company linked to the ecosystem, is going to be dependent on the others and their strategies and possible changes happening inside the ecosystem and inside the companies (Valkokari et al. 2017). Because of the constantly changing environment and adjustments, every firm participating in the ecosystem needs to have their own individual ecosystem strategy to be able to determine their competences and roles in the ecosystem planned by the orchestrator (Adner 2017). However, the ecosystem strategies might be affected by more emerging approaches than intentional as the process of creating the ecosystem strategy may not be inevitably clear to the participants (Valkokari et al. 2017). Therefore, lead firm is responsible for taking strategic approach on ecosystem participants and guide them to develop their capabilities according to the environmental changes and needs (Williamson & De Meyer, 2012).

According to Valkokari et al. (2017) cooperation and taking competition into account is necessary to be successful in ecosystem creation. Therefore, it is inevitable that participants in the ecosystem are sharing and agreed the value proposition (Ma 2021; Valkokari et al. 2017). As Adner (2017, p.49) mentions: "the heart of ecosystem strategy is the search for alignment", which concludes the importance of cooperation and co-creation in innovative ecosystem and strengthens the roles of the firm in the ecosystem (Visscher et al., 2021). The main function of the ecosystem strategy is to create a map and a plan in which the roles of the participants are determined and how they are connected to be able to find the competitive advantages for the ecosystem to be successful (Ma 2021). It is important to state that even though the ecosystem strategy is clear and carefully planned, it does not mean that it will naturally be successful as not every firm's strategy is convenient and flexible for working in an ecosystem (Ma 2021). Williamson and De Meyer (2012) state that knowledge is one of the base resources for ecosystems and their strategy and this can provide advantages in situations where customer is requiring some specific details or solutions in which the specific knowledge is needed.

Khademi (2020) states in their article that collaboration and co-creation are important strategies for companies to be successful nowadays in the market. Hannah and

Eisenhardt (2018) agree with Khademi and add competition to the list of these fundamental factors to successful strategy. According to them, balance between competition and cooperation is necessary when creating successful ecosystems because too much cooperation can affect their value capturing process and too much competition may lead to failure (Hannah & Eisenhardt, 2018). Daymond et al. (2023) explain in their article that for ecosystem to succeed, it requires implementations in the strategy depending on the phase ecosystem, for example, when ecosystem is emerging, it is necessary to encourage companies to network and create connections between other partners, but when ecosystem is evolving it is necessary to strengthen these relationships created previously and find state in which partners are cooperating towards the value proposition together by sharing their resources. To properly create the base for working relationships is the responsibility of the leader, because they have selected the partners and have a vision of how the partner's capabilities and resources are going to be implemented in the ecosystem strategy (Khademi, 2020). By cooperating actively with other partners in the ecosystem, the ecosystem will be able to create more valuable innovation and therefore also might have more growth (Williamson & De Meyer, 2012).

### 2.1.2 Innovation and open innovation ecosystems

In innovation ecosystem, the focus is to develop innovative solutions and new information to create value propositions (Cobben et al. 2022). Every member has a role which is selected according to the resources the firm can provide for the ecosystem (Cobben et al 2022). An innovation ecosystem concentrates on finding new information and opportunities in the business area and its value is created by cooperating through innovative way of working instead of the current resources and business situation (Valkokari et al., 2017). It can be defined as network of companies who share the value propositions and to reach the solution their customer requires, they are willing to develop their knowledge and capabilities in cooperation with each other (Granstrand & Holgersson, 2020; Haukipuro et al., 2023; Jiang et al., 2022). As companies in innovation ecosystem are closely working together, they are interdependent of each other and therefore it is necessary for them to find ways to integrate the resources and connect the capabilities

to succeed in providing the value proposition (Klimas & Czakon, 2022). According to Valkokari et al. (2017) innovation ecosystem can be described by their capability in adapting and being able to evolve in constantly changing environment.

In innovation ecosystem, participants are closely cooperating with each other and co-creation between the members is critical for the success of the ecosystem as every member is connected to each other (Valkokari et al., 2017). Granstrand & Holgersson (2020) state that usually definitions of innovation ecosystems concentrate more on collaboration than competition. Creating and building these connections inside the ecosystem are crucial as the methods and process are constantly improving in innovation ecosystem, one update somewhere in the ecosystem will most likely cause change also in other parties' processes and therefore ensuring the smooth communication and cooperation is important (Jiang et al., 2022).

According to Haukipuro et al. (2023) innovation ecosystem provides its partner companies opportunities to generate value that they would not be able to do alone. Innovation ecosystems often are built around a one core company and usually this leader company is coordinating the innovation ecosystem and therefore also assisting the other actors to create connections among the ecosystem (Jiang et al., 2022; Klimas & Czakon, 2022). Small and middle-sized companies in the ecosystem usually need this larger core company, which enables the ecosystem to be more connected to the competition in global level (Valkokari et al., 2017). Sun and Wei (2019) state in their article that even though ecosystem is based on cooperation, the focus must be on leader firm which by its resources provides the guidelines for the ecosystem as a whole.

In innovation ecosystem, partners are required to create plans for the constantly changing environment and how they make sure that they can react to the external changes quickly and adjust their processes accordingly (Sun & Wei, 2019). Even though every partner is required to have their own plans for the innovation, in ecosystem quite much depends on how other partners are conducting their practices and therefore it is

important to select the partners with whose practices match and complement the innovation creation process (Visscher et al., 2021).

When innovation ecosystem uses external innovation sources, it can be called as open innovation ecosystem (Haukipuro et al., 2023). This enables companies not only cooperate inside the ecosystem, but also provide opportunities to expand the use of resources to other companies as these external sources are important for the ecosystem (Haukipuro et al., 2023; Xie & Wang, 2019). Naturally, this opportunity also provides learning possibility for both parties, the ecosystem and the external source, about the cooperation in different situations when there is a need for additional knowledge or resource that is not available in the ecosystem (Valkokari et al., 2017).

Open innovation is based on the idea of firms using additional external resources with their internal resources to develop their own innovations (Bogers et al., 2019). It provides ideas how to use these resources available as well as gives firms possibilities to understand that they do not necessarily need to be able to create all the resources by themselves and the responsibility can be shared with others (Öberg & Alexander, 2019). When company decides to go towards open innovation, they make critical strategic decision which requires them to develop their strategy to be able to exceed the company boundaries to search external resources (Alam et al., 2022).

Even though companies might have the internal ability to create the needed knowledge or technological developments that they need, it can be more efficient to use external sources who might already have the knowledge or technology available (Aparecida et al., 2022). Therefore, the ecosystem approach includes the external knowledge sharing cooperation between the ecosystem members and highlights the innovation outcome (Remneland Wikhamn & Styhre, 2023). When collaborating in the ecosystem, the company has possibility to increase its capabilities available for use (Öberg & Alexander, 2019). Bogers et al. (2019) states that companies should give a chance to external source

usage as in today's environment finding suitable actors with needed knowledge can be found easily through digital platforms that can help provide solutions more efficiently.

In open innovation ecosystem, the leader company has important role to orchestrate the ecosystem (Remneland Wikhamn & Styhre, 2023) and therefore to carefully select the partners and recognize what resources the ecosystem needs and what kind of capabilities will every company joining bring with them (Öberg & Alexander, 2019). Companies in the open innovation ecosystem should, in addition to the information they are receiving directly, also be able to detect the tacit knowledge and use this to create innovation results (Aparecida et al., 2022). That kind of sharing is relevant to the innovation processes, and it shows also partners that they have relationship which includes trust and openness (Öberg & Alexander, 2019).

### 2.1.3 Companies as a part of the ecosystem

In ecosystem, there are two main roles who are making the ecosystem work properly, the orchestrator and the participants. The orchestrator in the ecosystem provides the structure and vision for the other participants and determines the roles for them (Adner, 2017). Regardless the orchestrator has been determined, it is necessary that every participant company in the ecosystem engages to cooperative working style to coevolve the capabilities that the ecosystem requires to succeed (Moore, 1993).

It is important to notice, that even though the orchestrator position has been filled out, every participant is providing their capabilities to the ecosystem and according to Tsujimoto et al. (2018) and Rong et al. (2018) every single decision made by ecosystem member will have an effect towards the other members and their contribution and behaviour. Kohtamäki et al. (2019) also states that any change in any participants business model can affect heavily to other participants actions. Therefore, it is important to create open and cooperative environment for the ecosystem to be able to evolve and succeed in the long-term (Ates, 2022) to avoid situation where participants assume that the others are reaching towards the same outcomes as they (Adner, 2017). If for some partners

in the ecosystem collaboration together with other partners to reach innovation is new way of working, it might be that they are more eager to concentrate on short-term solutions rather than long-term which should not be the case (Ates, 2022). Therefore, it is important to have clear and solid understanding of the outcome that the ecosystem is willing to reach, and the duty of the orchestrator is to keep the other partners motivated by adjusting the principles if needed (Ma & Hou, 2021).

As cooperation is one of the key elements in building a successful ecosystem, networking plays essential role in finding suitable resources and partners to cooperate with and makes sure that the dynamics are understood and considered properly (Rong et al. 2018). Ates (2022) presents the term co-appropriation as a key dynamic to create attractive ecosystem for the smaller companies. The description of the co-appropriation concept is presented as enabling all the members in the ecosystem to have possibility to benefit and get new value from their work effort to the ecosystem (Ates, 2022). Especially for smaller participant companies, it is necessary to be able to see the possible benefits that they can achieve by participating in the ecosystem as they might be more sensitive for the changes than larger companies (Ates, 2022). Ates (2022) also mentions that smaller firms usually have more entrepreneurial mindset and therefore larger companies, who usually are in the leader's role in the ecosystem, are interested to include them in the ecosystem to create value with their capabilities and ideas.

It is essential that participants in the ecosystem have roles that are the most suitable ones for their capabilities and processes, as Tsujimoto et al. (2018) suggests that coherency is one of the key concepts of ecosystem as it can lead more successful outcomes if the participant’s behaving and making decisions processes have general similarities, otherwise that can cause unexpected outcomes. When the roles and functions in the ecosystem have been clearly determined beforehand, it can help to avoid a situation where there are several views and expectations of the value proposition of the ecosystem and how it will be reached (Adner, 2017). Balancing between the successful innovation and creating the value proposition between the members of the ecosystem is critical and

therefore it is important to take care that the responsibilities are divided equally (Ma & Hou, 2021).

In ecosystem, the main roles are the orchestrator and the participants (Dedehayir et al., 2022). Where orchestrator manages to determine the common vision of the value proposition the ecosystem by cooperating tries to achieve, the role of the participants mainly is to distribute resources as well as creating relationships with other actors in the ecosystem to create value and to avoid situation where only resources are transferred (Huang et al., 2020). Relationship between the firms in ecosystem is crucial as they have interdependence between each other, and that means that every action some member makes will most likely affect also the other members actions (Dong et al., 2022). This kind of collaboration between the actors is crucial to ecosystem success and therefore the role of participants is important (Ates, 2022) as a larger proportion of the companies most likely involve in the role of participant (Ates et al., 2023).

Participants play critical role to accomplish the activities determined and guided by the ecosystem and the orchestrator (Dong et al., 2022). It is crucial for the ecosystem to guarantee the suitable knowledge to keep up with the constantly changing technologies and environment, therefore the resources provided by external suppliers are necessary as it is not profitable for the companies to try arranging all the needed resources by themselves (Ates, 2022). By sharing the resources, the supplier helps the ecosystem to implement their resources as well as avoid possible bottlenecks with external knowledge (Masucci et al., 2020). These cooperation activities between the participants and other parties can be used as learning actions to enhance the possibility to create innovation inside the ecosystem which can lead to “symbiotic relationship” where companies create strategy together to solve their issues through mutual actions (Dong et al., 2022).

Huang et al. (2020) mention in their article that the thought that participants provide solution in any occasion to their customers, which is in this case the ecosystem, is harmful to the firm and therefore it is important that information is being shared with every

member of the ecosystem to avoid the situation where one company's resources are used without mutually providing something as a return. According to Dong et al. (2022) communication between participants depends if they have formal or informal relationship, which differ each other whereas formal relationship is based on contracts and informal relationship takes trust in account. In ecosystem context, the informal side is playing a large role. Participants are in value creation role in ecosystem, as they provide the knowledge and expertise in their own area, which helps the ecosystem to reach their value proposition (Dedehayir et al., 2022).

Companies attending in the ecosystem are usually carefully selected and according to Tsou et al. (2019) selecting the suitable partners is crucial to have successful partnership as the goal is to find relevant partners to build sustainable and effective relationships. Carefully selected partners with who the communication works and learning aspect of the ecosystem strategy is understood, enables more smooth information exchange (Bacon et al., 2019). In ecosystems, long-term relationships are valued and therefore when selecting the partners, it is important to indicate what kind of knowledge they can provide for the ecosystem in long-term (Tsou et al., 2019). When every partner commits to the ecosystem strategy, rules and processes, the trust between these companies is more likely to establish as shared understanding occurs (Tsvetkova et al., 2017) and every company can rely on that other are reaching towards the same goal and therefore also concentrate to successfully conduct their own parts of the process (Theurl & Meyer, 2018). According to Ma and Hou (2021), for ecosystem to work properly, it is necessary that partners can trust each other.

Cooperation between partners is mainly sharing and compounding the knowledge or possible already existing technologies with each other (Theurl & Meyer, 2018), which is required to deliver the value proposition favorably because diverse set of partner's capabilities and resources is needed to create innovation (Gueler & Schneider, 2021). Smaller companies are usually more dependent on the open innovation processes than the larger companies because the ecosystem practices have larger effect on their

revenues and therefore SMEs will implement the open innovation practices more exclusively (Radziwon & Bogers, 2019). According to Radziwon and Bogers (2019), as there are differences between different sized companies, it is necessary not only try to implement the current open innovation successfully but also taking long-time perspective in to account. Larger companies usually do not join to the ecosystem, unless they can trust that they will receive more value from the cooperation actions than they are required to create with their own resources (Gueler & Schneider, 2021).

Inter-organizational relationships are required when creating a successful ecosystem (Gueler & Schneider, 2021). When collaborating inside the ecosystem, it is necessary that every party is aware of how the ecosystem is built, who are part of it and how different processes are planned to be performed (Tsou et al., 2019). This mutual understanding of the way of working is important as partners are combining their capabilities and knowledge to coevolve the processes towards successful outcome (Tsvetkova et al., 2017). Therefore, it can be addressed that in ecosystem companies are dependent on each other's actions and independent performance is not appreciated (Theurl & Meyer, 2018) as sharing knowledge is one of the most essential characteristics of cooperation between partners in the ecosystem (Bacon et al., 2019).

### 2.1.4 Co-creation and collaboration in the ecosystem

In today's world, the importance of external resources and connections is growing, and companies are expected to create networks to be able to compete in the industry (Ketonen-Oksi & Valkokari, 2019) as well as creating innovation together where every partner can support each other with their resources (Steinbruch et al., 2021). It can be said that one of the key determinants towards successful outcomes and relationships is value co-creation (Huang et al., 2020). Not every company can have all the necessary resources and therefore co-creation enables every party to concentrate on the factors and knowledge they are experts in (Sjödin 2019).

According to Klimas and Czakon (2022) value co-creation is in the center of every ecosystem's attraction. Value co-creation can be defined as practice where partners actively communicate and provide necessary knowledge and information to each other to create value by interacting (Pera et al., 2016). Co-creation can be more effective when diverse actors are selected to act in the ecosystem to bring different resources to the table (Ketonen-Oksi & Valkokari, 2019). This can enhance the process as usually companies are not able to create innovation only with their own resources and co-creating and collaborating within the ecosystem can provide better starting points for innovation and value creation (Steinbruch et al., 2021). Ecosystem will most likely favor when successfully coordinating its available resources in cooperation with every partner, whereas this influence can be damaging to its competitors (Huo et al., 2022).

Co-creation is an extremely important factor in innovative ecosystems where the goal is to bring up innovation by collaborating with different partners (Steinbruch et al., 2021). To ecosystem to grow and be successful, it is essential to continuously control the resources available and to be ready to constantly find new elements internally or externally for successful value creation (Basole et al., 2015). According to Pera et al. (2016) one of the main keystones for co-creation is to be able to organize resources successfully which enables actors to be involved in the processes and this can play meaningful role for both, increasing the productivity of the whole ecosystem and individual firms (Huo et al., 2022). This requires actors' constant participation in the whole process and therefore it is crucial that ecosystem has precisely defined its vision, so every activity can be shaped towards that goal (Ketonen-Oksi & Valkokari, 2019).

When choosing partners for the ecosystem, it is important to make sure that every actor can provide diverse resources and willing to use their time for the development of the ecosystem together with other partners as commitment is extremely crucial for ecosystem and value co-creation success (Ketonen-Oksi & Valkokari, 2019). Trust plays crucial role among the ecosystem and when actors in the ecosystem have relationships where they can rely on each other to conduct the actions needed, it helps ecosystem to be

more innovative and therefore also reaching to better outcomes (Steinbruch et al., 2021) as favorable outcome in ecosystem requires every partner's contribution (Pera et al., 2016). Companies should concentrate on the whole ecosystem and how to make it successful, not only to better their own resources and capabilities but to build long-lasting relationships which have positive effects for all participants (Huo et al., 2022).

Sjödin (2019) highlights the importance of process innovation in ecosystem co-creation and how studying internal and external processes provide more detailed understanding of the strategies that are suitable for instance when selecting the partners or developing the processes in the ecosystem. Sjödin (2019) also mentions that implementing process innovations in the ecosystem is usually more complicated than product innovation as it is based on the idea that companies involved understand the importance of sharing expertise and know-how when building the processes.

When co-creating value successfully together with the members of the relationship, it can also increase the partner's competitive advantage individually and by that the benefit is higher (Cheung et al., 2011). Co-creation requires people and their influence on the relationships and overall interaction to create value (Krishna, 2023), so therefore it is important that more than one person per participating firm is involving to the processes and helping to create the trust between the actors (Svensson, 2006).

The main purpose for collaboration is value creation which is often the aim why companies are willing to participate in it (Cheung et al., 2011). Collaboration might require using technological tools, but without shared understanding among the participants about the process and tasks, these tools might be ineffective (Rustholllkarhu et al., 2020).

## 2.2 Organizational learning

Argote and Miron-Spektor (2011) define organizational learning as a change in organization caused by the collected knowledge and experience over time. These experiences are modified to develop new routines that are processes towards learning in the

organization (Muehlfeld et al., 2012). Yi et al. (2022, p. 3) describes organizational learning as a "dynamic capability that enables a firm to synthesize, reallocate, and reconfigure its internal and external resources". Organizational learning has also been described as person's ability to collect knowledge and therefore the focus has been on individuals instead of concentrating on the processes and systems of the organization (Elkjaer, 2004). According to Crossan et al. (1999) organizational learning provides opportunities for companies to be able to renew their strategy and enhances the continuous development in the company by using the information provided by the constantly changing environment to learn.

March (1991) states that the most important mechanisms to succeed with organizational learning are exploitative and exploratory learning. Exploitative and exploratory learning are necessary parts of organizations competitive advantage as well as main building blocks for its performance development (Ali, 2021). According to Yi et al. (2022) in exploitative learning organizations capabilities and current resources are extended and evolved to be able to use them in the best possible way, which will lead to progressively changes in the resource configuration. In exploratory learning, organization is learning from new aspects of knowledge and these new explored skills and information will be adjusted and reconfigured to the existing procedures which will develop the organizations former processes (Yi et al., 2022). A combination of these both approaches is the key to balance the organizational learning process, as the most effective, already existing routines and practices are selected and combined with the new possible practices to adapt the environment (March, 1991). Therefore, Ali (2021, p.4) concluded that to be able to compete and build a strong competitive advantage, it is important to base that to "exploiting existing learning competencies and exploring new learning opportunities".

### 2.2.1 Learning in the ecosystem

When thinking about organizational learning, the main factor to enable potential learning are the ecosystems and actors, who are participating in that cooperation (Peters et al. 2016). Learning in the network can be described as "learning by a group of

organizations as a group" as Knight and Pye (2005, p. 371) mentioned in their article. Gibb et al. (2017, 15) determine network learning as follows: "a learning process where the network is the learner entity as a whole". Kallio and Lappalainen (2014) concluded that to have competent performance and ability to develop new innovations in network, one of the main factors to enable that is learning especially in case of innovation networks which are aiming to generate new knowledge.

Learning inside the network is not only happening by cooperating with each other. Participants have a lot of knowledge that is required to be recognized to succeed with the learning process (Peters et al. 2016). In this kind of situation, in which the knowledge is available, it is essential that participants notice and embrace the competence to learn and understand it (Kohtamäki et al. 2023). Even though the network structures can be integrated and include several characteristics, which leads to more complex relationships inside the network, it is important to have a common understanding of the previous experiences and common routines within the organizations, as well as notice the available knowledge and tacit knowledge (Peters et al. 2016). Gibb et al. (2016) mentioned in their article that successful network learning could cause changes to various processes, for instance regarding communication, or even network structures and therefore it cannot only be seen as individual or group level learning. According to Kohtamäki et al. (2023), in innovation networks' main interest should be in learning from other participants and concentrate to how it will affect on different beneficial outcomes, for instance related to resource-sharing and risks.

Motivation can be seen one of the building blocks of learning. Danatzis et al. (2022) presented in their article that even though participants may have the resources and capability to cooperate with each other, but they might not have the readiness to be motivated to participate. Rodrigo and Palacios (2021) mentioned in their article that motivation and commitments are connected to each other, for example participants have certain assumptions of what they will be receiving by participating which then increases their motivation to take a part in the actions. According to Danatzis et al. (2022) it is

important to connect participants and their motivations and abilities to construct the ecosystem, as having common understanding and being motivated to proceed towards the target is critical when partners are willing to achieve the targets (Kohtamäki et al. 2023).

As the learning occurs inside the ecosystem, it is based on the collaboration among the participants in the ecosystem and therefore the processes of the ecosystem are not possible to be controlled by single participant (Kallio and Lappalainen, 2014). According to Dirani et al. (2021), shared understanding of the desired outcome can lead to more effective learning culture within the ecosystem. Also, trust and transparency are important enablers for successful learning (Dirani et al., 2021).

### 2.2.2 5I-model

Crossan et al. (1999) developed 4I-framework to present how organizations and businesses can learn through organizational learning by defining four main learning processes which function in individual, group and organizational level that help companies to learn and renew:

1. Intuiting
2. Interpreting
3. Integrating
4. Institutionalizing

According to Crossan et al. (1999) the steps of 5I-model proceed as follows: the first step of the process is intuiting, which means that certain patterns or possibility are identified through one's own experience, and this can affect behavior and decisions made by the individual without recognizing it. The second step is interpreting, which connects the intuitive fundamentals of the learning process with conscious characters and presents the ideas born from the previous step verbally or with actions to the other participants. The third step is integrating, in which the development process starts, and a more

coordinated and communicated way of working among the groups is presented to reach a common understanding of the processes and actions among the participants. Fourth and the last step is institutionalizing, and it assures that the actions planned in the previous steps are taking place and the learnings from the processes are defined to assure successful proceedings in organizational level even if the members of the groups or organization change during the years (Crossan et al., 1999).

Jones and Macpherson (2006) presented an extended version of the 4I framework, which is called 5I (Table 1). It adds one process element to the previously presented Crossan et al. (1999) version to also include the important role of the external organizations in standardizing the information flow especially beneficial for small and middle-sized enterprises (Jones & Macpherson, 2006). The added factor is called intertwining which demonstrates that the learning can happen between different organizations, and it is not limited only to the internal operations of the organization, and it is suggested also to develop the learning processes towards more co-creative way (Jones & Macpherson, 2006).

| **Level** | **Process** | **Inputs/Outcomes** | |
|---|---|---|---|
| Individual | Intuiting | Experiences, images, metaphors | 4I-model by Crossan et al. (1999) |
| Group | Interpreting | Language, cognitive map, conversation/dialogue | |
| Organization | Integrating | Shared understanding, mutual adjustments, interactive systems | |
| | Institutionalising | Routines, diagnostic systems, rules and procedures | |
| Inter-organization | Intertwining | Customer requirements, supplier suggestions, after-sales service, regulatory environment, knowledge providers | Extended 5I-model |

Table 1: Extended 5I-model by Jones and Macpherson (2006)

## 2.3 Theoretical framework

Table 2 presents the framework to have a more detailed understanding of the learning practices with 5I-model in ecosystem context. Framework connects ecosystem structures, ecosystem investments and ecosystem capabilities to the 5I-model presented above, which will be shortly introduced in the next paragraphs.

Ecosystem structures enable the cooperation within the ecosystem to be more effective and provide best possible outcomes and benefits for the ecosystem and its participants. According to the network theory, in the ecosystem or network structures the participants are connected to each other by ties, which enables the outcome by collaboration between the participants in the processes (Borgatti & Halgin, 2011). In this framework, this is connected to the 5I-model to show how these structures provide the possibility to effectively share knowledge and resources through these structure processes between the participants.

Inside these structures, ecosystem investments in this context contain certain habits and processes that participants are investing in to strengthen their position in the ecosystem. Network theory presents that humans are in a large role when it comes to this kind of social processes (Burga & Rezania, 2017) which in this study are mainly social, human investments connected to the learning process model, for instance investing into relationship-building between other participants which can lead to better knowledge-transfer processes.

Ecosystem capabilities in this study context is the outcome from the participants' time in the ecosystem. Sunder and Ganesh (2020) present the concept of dynamic capabilities ecosystem, which refers to the group of different capability structures of the participant companies which include several different factors for example related to external influence, feedback flow and the changes in environment. Companies will use the new knowledge provided by the other participants in the ecosystem to develop or create new capabilities in interaction with others (Abbate et al., 2022). Ecosystem capabilities in this

case includes the resources that participants develop because of the ecosystem and its connections. For example, if the participant uses time and invests in trust-building, it can positively affect the relationship and by that establish longer-term relationships.

| | **5I-model (learning process)** | | | | |
|---|---|---|---|---|---|
| | Intuiting | Interpreting | Integrating | Institutionalising | Intertwining |
| Ecosystem structures | Previous experiences and/or expectations of participating in ecosystem | Sharing experiences to find suitable mechanisms and practices for information sharing | Creating more coordinated way of working and actions | Managing the new processes and saving information | Benchmarking similar structures from external environment |
| Ecosystem investments | Taking time to understand existing knowledge and what is required | Connecting members to get mutual understanding of the required investments | Deciding the main targets | Following the results of the decided investments | External investments |
| Ecosystem capabilities | Company-specific capabilities and opportunities, existing relationships between participants | Determining the available resources and how those are required to be adjusted to reach the goal | Organizing the available resources and developing the processes | Ensuring that resources are used correctly to reach productive flow | Possible usage of external resources |

Table 2: Framework to illustrate how learning occurs in the ecosystem and what are the learning practices

# 3 Methodology

In this methodology section, the methodology used in this thesis will be presented. In this overview, the research method and design used in this study is presented, a short description of the case is included, and a representation of how the data has been collected and analyzed. In the end of this section, the limitations and validity of study are outlined.

## 3.1 Research method and design

According to Saunders et al. (2007) research design gives the frames of how to answer the research question and it will guide through the process clearly from specifying the research question through data collection and analysis. In this study, the research question is determined as follows: **"What are the learning practices that take place in the co-development of the ecosystem?** And the question will be answered by creating a framework combining ecosystems with Jones and Macpherson's (2006) 5I-learning model with the process steps of "Intuiting", "Interpreting", "Integrating", "Institutionalizing" and "Intertwining". The following sections will present shortly the methodology by using Saunders et al. (2007) research onion which will be visualized in Figure 1.

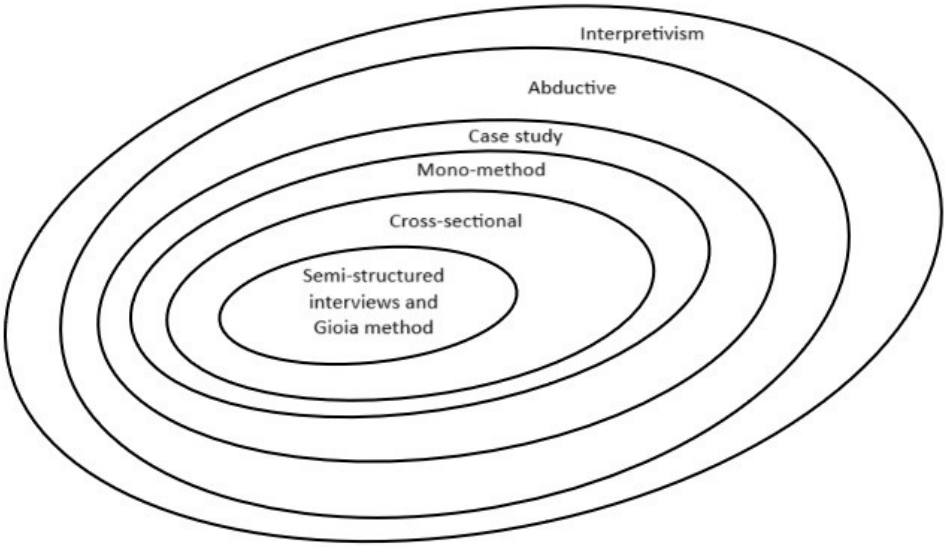


Figure 1: Representation of research onion

The first layer of the onion includes the philosophical direction of the study, which mainly influences the researcher's own viewpoint of the connection between the process and its knowledge (Saunders et al. 2007). This study will follow interpretivism, which according to Saunders et al. (2007, p. 106) "emphasizes the differences between conducting research among people rather than objects" and therefore it is suitable for this study as the main target is to determine the learning practices within the target ecosystem by conducting qualitative research.

The second layer introduces the theoretical approach, and in this study an abductive approach has been selected. Abductive approach is described by Saunders (2023) as a combination of deductive (from theory to data) and inductive (from data to theory) approaches, in which the motion happens between the data. Eriksson and Kovalainen (2008) explain abduction as movement of different descriptive narratives provided by people to transfer those into different concepts to form presentation of the phenomenon. According to Saunders (2023) abductive approach is "open and sensitive for data while also using pre-existing theories for inspiration and to help identify and interpret

patterns". Which is suitable for this study, as the research question is willing to determine the learning practices.

The third layer contains different research strategies. In this study, single case study will be conducted as the research question is created to answer to "What?"-question and the data will be collected through interviews (Saunders et al. 2007). Case study is defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence" and it will provide "a rich understanding of the context of the research and the processes being enacted" (Saunders et al., 2007, p. 139). Case study has been selected to this study as the focus is on participant experiences in particular project, as in case studies the main interest is to get to the understanding of the participants vision (Eriksson & Kovalainen, 2008).

The fourth layer covers the methods used to conduct the research. Mono-method qualitative study has been selected for this study, as it uses single data collection technique which in this case are semi-structured interviews and analysis is based on the answers (Saunders 2023). The fifth layer includes the selection of either cross-sectional or longitudinal time horizon. This study will use cross-sectional time horizon as it includes a certain phenomenon at an exact time where longitudinal time horizon requires data collection from longer period (Saunders, 2023) and interviews with certain focus group will be conducted (Eriksson & Kovalainen, 2008).

The sixth and last layer of the research onion includes the data collection and analysis, which in this study will be conducted through semi-structured interviews as data collection method, which provide open-ended questions shared by the interviewees related to their own experiences of the studied topic (Eriksson & Kovalainen, 2008) and Gioia method (Magnani & Gioia, 2023) will be used to analyse the data. These will be discussed more detailed in data collection chapter.

## 3.2 Case background

The open innovation ecosystem which has been selected to be studied as a case in this study has been constructed mainly of members from the manufacturing industry to build an open and collaborative environment that leads the industry towards more sustainable transformation. Trust is one of the key cornerstones for this ecosystem, and participants are eager to collaborate to develop their relationships. This ecosystem includes companies from manufacturing industry and IT-industry, and the orchestrator of the ecosystem has strong background of being involved in different ecosystem projects over the years.

Together within the ecosystem as well as with external partners, this ecosystem is willing to create benefits for its partners in the short term but also contributes towards long-term impact in the industry. Participants have a willingness to co-create and collaborate with each other to move from more traditional ways of working towards more collaborative environment that can be built up on a digital base.

This ecosystem was selected for this study as it as a financed project is coming to an end after several years of continuous work with developing and co-creating a new collaborative environment. Therefore, the participants have collected significant experiences during the years and have experienced different outcomes about the processes, which provides great opportunity for “lessons-learnt” -type of study to find out the learning practices in this open innovation ecosystem.

## 3.3 Data collection and analysis

Data collection for this study has been made through semi-structured interviews, in which guided questions for the interview have been determined but are open in a way that gives possibilities to for instance modify the order in which the questions are asked to help with the flow of the discussion (Saunders, 2023). As the target for this study is to determine the learning practices within the ecosystem concept by using the 5I-learning

model, the interview questions were divided into five main parts. The interview began with general questions regarding previous ecosystem experiences and ecosystems target determination. Then, the next parts were related to expertise, collaboration, learning processes and closing questions (See Appendix 1).

In total, five interviews were conducted as semi-structured interviews. The interviewees were representatives from different companies who have been participating in the ecosystem's different sub-projects. Their information has been anonymized to provide a secure environment for the discussions. Interviewees were contacted by email to ask if they would be interested in participating in the interview. One of the interviews was conducted as a phone interview in Finnish, which was also successfully recorded and did not differ from the other interviews. All the other interviews were conducted in Teams in Finnish as it was the common language with all the participants and interviews were recorded with the consent of the interviewees to enable the trustworthy of the results for the analysis.

After interviews, transcriptions were made from the interview recordings to be able to easily code and connect different interviewees answers. After collecting the data, the transcriptions were made based on the automatic transcriptions from the Teams recording. These were opened in Microsoft Word and possible errors were corrected by listening to the recording and correcting the text file to avoid any data errors.

| Date | Interviewee | Place of interview | Length |
|---|---|---|---|
| 23.9.2024 | Interviewee 1 | Phone | 34 min 30 s |
| 26.9.2024 | Interviewee 2 | Teams | 20 min 36s |
| 30.9.2024 | Interviewee 3 | Teams | 32 min 31s |
| 1.10.2024 | Interviewee 4 | Teams | 44 min 48s |
| 3.10.2024 | Interviewee 5 | Teams | 42 min 52s |

Table 3: Interview summary

Selected approach for this study is within-case analysis, which provides deep understanding of the studied phenomena within single case (Mills et al., 2010). After having the data in easily accessible and understandable form, this study continues with the analysis of the collected data. In this study, Gioia method was used to determine the main themes from the data starting with first order concepts, proceeding to second order themes and ending the process with aggregate dimensions (Magnani & Gioia, 2023) that could be connected to the 5I-learning model.

The main goal of using Gioia method is to create data structure, which visualizes the data as well as shows how the data has been processed to find the main themes for the study (Gioia et al., 2012). It also enables transparency of how the data is processed and states the data in more convenient form (Gioia et al., 2012). Gioia (2020) determines the Gioia method steps as follows:

1. Compilation of first order concepts by searching for resemblances and differences among the interviewees' answers
2. Organization of first order concepts into second order themes under more detailed categories, which help to determine the main themes
3. Progression of second order themes to aggregate dimensions, which connect the themes into more theoretical concepts

In this study, the aggregate dimensions are the phases of the 5I-learning model. The whole data representation can be seen in Figure 2.

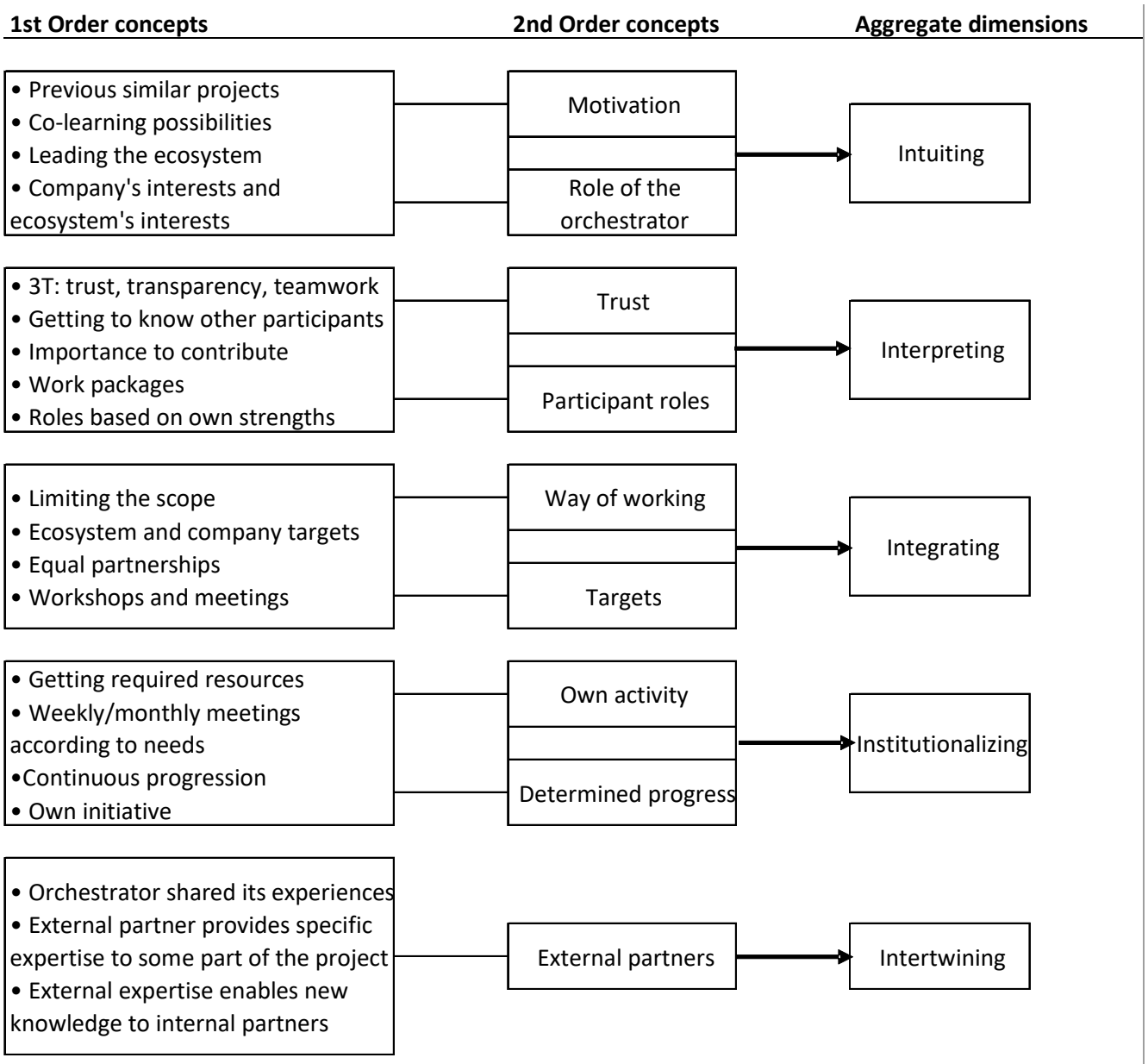


Figure 2: Data representation of the study by using Gioia method

## 3.4 Reliability and validity of the study

Reliability and validity in research have been essential factors in discussions about research quality (Saunders, 2023). In this study, previous studies which have been used to present the theoretical background have been peer-reviewed, which improves the quality and reliability of the theoretical framework which has been built based on these studies. To ensure that the collected data is in the best possible form to conduct reliable analysis, the interviews were recorded, and transcripts were double-checked to avoid any errors. Also, direct quotations have been included to the results, which emphasize the process of the data results. These results from the interviews are in line with the theoretical framework and there are similar factors between the previous studies and these results, which can be easily modified and added to the theoretical framework.

Following trustworthiness table (Table 4) created according to Eriksson and Kovalainen's (2015) model, will present how several different methods have been considered to improve the research quality in this study. It will present trustworthiness through eight different terms: Background, Dependability, Transferability, Credibility, Conformability, Integrity and Usefulness.

| | |
|---|---|
| **1 - Background**<br>The intensity of previous knowledge about the topic | Theoretical background was collected by using peer-reviewed research articles which have created the base for conducting this study. Author has familiarised themselves with the project and conducted 5 interviews with participants who have been taking part in this case project.<br>**Result**: Well-conducted background and results from the interview provide good level understanding about the topic. |
| **2 - Dependability**<br>The level of consistency of the statements | Interviews were recorded and transcriptions were made after the interviews based on the recordings on Teams. Participants were company representatives who have been participating in the project and they could freely present their experiences and opinions about the interview questions and the research.<br>**Result**: Data collected from interviews has been precisely transformed from recordings to text which indicates good level of consistency. |
| **3 - Transferability**<br>The level of result applicability to further contexts | Data was collected from interviews with five representatives from different companies who participated in the ecosystem project.<br>**Result**: Similar ecosystem structures can utilize the findings. |
| **4 - Credibility**<br>The level of accurate representation of the data and results | Conducting a broad theoretical background review before collecting data through interviews provided possibility to specify interview structure to receive accurate data. Interviewees did have personal experiences about the topic which indicates their interest to participate in the research.<br>**Result**: Good level of understanding of the theory and data was reached. Interview data was collected and precisely analysed and connected to the theoretical background. |
| **5 - Conformability**<br>The level of interpretations driven by the participants and observations, not by the biases of the researcher | Overall, 5 participants from 5 different companies participating in the case project were interviewed between September and November 2024. Interviews were semi-structured, which gave the guidelines for the process but both, interviewee and interviewer, were actively participating and discussing the topics.<br>**Result**: Findings can be shared to case project participants. |
| **6 - Integrity**<br>The level of incorrect statements affecting interpretations | Participants were selected from the companies cooperating within the case and have been involved with the ecosystem development progresses. Semi-structure interviews were conducted in positive and collaborative manners and every party could present their experiences freely as interviews were anonymized after wise.<br>**Result**: Sharing results with the ecosystem is acceptable. |
| **8 - Usefulness**<br>The level of relevance of the results | Data collected from the interviews was based on participants experiences on working in the case ecosystem project and the experiences about the learning practices were shared.<br>**Result**: Experiences about the project and its progress provided opportunity to review the project that is coming to an end. Results can benefit future ecosystem projects when creating suitable ways to learn in collaboration. |

Table 4: Trustworthiness table presented according to Eriksson & Kovalainen (2015) model

# 4 Findings

Findings section will present the findings of this thesis, which will be discussed in the context of 5I-learning model. In the end of this section, summary of the results will be presented together with revised framework to visualize what are the learning practices that take place in the co-development of the ecosystem.

## 4.1 Intuiting in ecosystem

Previous experiences and/or possible expectations of participating in the ecosystem are part of the intuiting process in the 5I-model. Ecosystem participants will have their thoughts and ideas based on the information they have gathered from their previous personal experiences. These previous experiences will enable ecosystem to create a structure, which will consider this gathered information which will optimize the information-sharing within the ecosystem and increase the productivity of decision-making.

### 4.1.1 Motivation

One key theme that appeared during the interviews with the participant company representatives is motivation as a building factor when cooperating with each other. Interviewee 5 mentioned that they have had a lot of cooperation with their customers during the past years, and without being able to develop processes together with them, it would be difficult to be motivated to proceed with the development. This can be combined with a comment from Interviewee 1, who said that if a company does not have any interest or motivation to change or improve their way of working, it will not develop.

> *"You can listen and discuss what other companies are working on or developing, but if your company wants to develop their own activities, it is necessary to have interest about developing the specific area as a company." (Interviewee 1)*

In addition to the above, when different streams for this ecosystem are built, it was important to link companies to be in the work packages that serve their existing capabilities

and provide opportunities to develop. This increases motivation when companies understand that they are also getting something in return for the resources they are providing. As mentioned by Interviewee 3, reciprocity is seen as a great advantage and therefore they are willing to invest time and money to be a part of the ecosystem.

> *"We see that the cooperation and possibility to cooperate with other participants in the ecosystem is such a great advantage that we are ready to invest time and money to be part of it." (Interviewee 3)*

Every company who has decided to participate in the ecosystem is voluntarily involved, which highlights the idea of them being motivated enough to be willing to participate and develop their own processes in cooperation with other participants. Interviewee 4 mentioned that one successful way of working in this kind of ecosystem context is that as every participant is voluntarily part of the ecosystem, they all are equal partners and therefore when leading some sub-project, this factor needs to be considered. Interviewee 2 is in line with Interviewee 4, when concluding that this kind of open ecosystem provides the best outcomes when equal partners are cooperating genuinely with each other. This will most likely lead to long-term relationships with every party as participant companies are not only thinking about their own perspective and what they are getting from this cooperation, but also as Interviewee 5 mentioned they are willing to see the benefit of the project in other companies as well.

> *"As every party is voluntarily involved to the project, there is no such power of command that could be in client relationship, […] therefore the leader is required to be able to lead the equal group of participants with a soft way" (Interviewee 4).*

> *"[…] we had transparent information sharing and it reflects to the matter that this kind of open ecosystem provides the best outcomes when information-sharing is not transactional and contractual […] but it is genuine cooperation." (Interviewee 2)*

> *"[…] we also thought it a bit broader context that not only the benefits between our company and the leader firm of the ecosystem, but in more general level that what are the benefits of our actions for these other companies." (Interviewee 5)*

To conclude, the motivation in this kind of ecosystem environment is necessary for successful outcomes. Companies are required to act and be part of the different processes and development actions with their own most effective way. Cooperation with participants is successful in the case where every participant is motivated and is willing to learn and create new innovations by cooperating genuinely with each other.

### 4.1.2 The role of the orchestrator

Previous experiences are extremely important when building an ecosystem as it is easier to combine different options to find the most suitable ones for this specific project. Multiple interviewees highlighted the importance of the orchestrator for the smooth operations of the ecosystem. Interviewee 5 emphasized that the orchestrator's previous experiences were necessary to build well-working ecosystem structure. Interviewee 2 sees the orchestrator as a cornerstone for keeping the ecosystem together, which indicates its successful presentation and work in this ecosystem.

> *"As we had the orchestrator here, […] which has previous experience, they know well beforehand that which companies make sense to be involved and they could build this very well together […], there was a wide range of expertise, so I would say that the orchestrator was in extremely important role." (Interviewee 5)*

> *"[…] that kind of good orchestrator that this ecosystem had is extremely relevant. Someone whose task is to ensure that the network stays together. […] But that kind of power that holds everything together is critical already in community of a few parties." (Interviewee 2)*

Orchestrator is also seen as neutral partner among all the participants, which can guide the ecosystem as well as specific partners to the right direction and help to select the right path according to Interviewee 5. Interviewee 4 mentioned that the orchestrator was important part in different workshops to facilitate the projects and their presence also helped to build the trust between the participants. Orchestrator also took care that everyone was included and was getting all help required.

> *"[…] in the future I believe that this kind of orchestrator is a relevant part of this whole ecosystem, that there is a party existing who is available and can conduct discussions with everyone impartially." (Interviewee 5)*

> *"[…] these workshop series included two to three company representatives and the orchestrator, and we worked together […] the orchestrator worked a lot to build trust between the participants. […] orchestrator made sure that no one was left behind […] to avoid unfair situations" (Interviewee 4)*

Several interviewees acknowledged orchestrators weekly letter, which included sharing information of the process and brought contribution to this ecosystem. This was perceived as a good thing, and it provided well overlook of the status and updates. Constant updates can help companies to see the overview of the ecosystem status and shortly provide them the sight to other participants progress which can also enhance their own operations with new ideas. Also, orchestrator provided information when needed to share information between the participants in different streams or if some participants resources were needed, orchestrator was the one to connect the parties.

> *"[…] orchestrator published weekly reflection letter, […] multi-channel activities." (Interviewee 4)*

> *"[…] weekly basis we received email from the orchestrator, that how they see the things and of course it is excellent situational awareness sharing and contribution to this work." (Interviewee 3)*

> *"[…] orchestrator made sure if something was missing, it was always linked to those in need to be able to spread information that what was happening in other streams but also when some input was needed then other parties could be joining to the loop." (Interviewee 2)*

Above examples highlight that ecosystem participants have experienced the role of orchestrator extremely important and critical from the perspective of a properly functioning ecosystem. It can be that as participants in this ecosystem might not have a lot of own previous experiences of working in the ecosystem or network structure, this kind of guidance from orchestrator who is specialized in the topic is more than necessary.

Practices as weekly letter with updates provided by the orchestrator is a good information sharing tool for the ecosystem.

## 4.2 Interpreting in ecosystem

By taking time and getting to know the fellow participants and their existing knowledge and resources, the ecosystem can build stronger relationships between the participants. This can be seen as an investment for the ecosystem, because it is based on the relationships and trust between the participants. When companies are aware of each other and know what kind of resources are available in the ecosystem, that will make the information- and resource-sharing easier between the participants. It is important to notice that all the investments that ecosystem is required to make to succeed are not financial, but also social or knowledge based.

Interpreting happens at a group level, and the ideas generated in the intuiting phase will be shared to the group. Ideas will be discussed and their influence on the current processes of the ecosystem will be evaluated, whether it is positive or negative and if it is suitable option to proceed forward with the idea. An important capability in this phase is the ability to interpret information and be able to see its effects on the current systems as well as which will be the next steps towards a successful outcome.

### 4.2.1 Importance of trust

Trust is necessary factor when building a long-term relationships in ecosystems. However, trust will not appear automatically as it requires that companies are familiar with each other, and they have experienced that the cooperation works well between these companies. Interviewee 5 highlights that starting to build the trust in the beginning of the project is important as it gives the base for the relationship. When the trust is built, it will come along with the whole project and help the cooperation to be more effective as all parties can trust that everyone involved will conduct their part. Interviewee 4 states that trust is the starting point to everything.

> *"[..] building trust. […] has lot to do with the fact that how every participant uses their own time and decides to contribute and invest in it. If others do not have time, they cannot contribute and then the trust will not be built […] and trust can only be built by contributing." (Interviewee 5)*

> *"[…] trust is like the starting point, starting corner there. It does not exist in the beginning, but it is required to be built. But the more there is trust, the more actively the beneficial information is shared, and the more learning occurs." (Interviewee 4)*

Trust is one of the cornerstones for cooperation and learning in the ecosystem, which is pointed out by Interviewee 3. Interviewee 4 was on the same page and argued that without trust, successful cooperation is not possible, and it is required that every participant is ready to work together and learn to trust to each other, as it will not suddenly appear. Interviewee 2 also highlighted the trust between the participants. This is especially important in the situation where participants do not know each other beforehand and in ecosystem context it can be that some already have the trust between them and others are starting to build it. Interviewee 1 mentioned one of the trust-building factors that even though virtual meetings are nowadays common, it is easier to start working with people if there has been face-to-face meeting beforehand. Therefore, the own motivation to be active in trust building is important for ecosystem participants and, they would like to get to know each other not only virtually, but also in real world.

> *"[…] openness and trust to be able to do work and development practices with different people and companies, it is not easy. And sometimes building the trust is like the things of the spiritual world, sometimes easy and sometimes not." (Interviewee 3)*

> *"[…] without trust, this will not work, and cooperation or teamwork will not be successful. […] this kind of trust was built, but it was not there on the day one, but it is built along the way and […] it could be said that one of the needed capabilities for participant is to be able to build trust." (Interviewee 4)*

> *"[…] trust between the participants is one of the capabilities, which is built as in the beginning of the project everyone committed to the common vision and target, and through that the trust between the participants is built." (Interviewee 2)*

> *"I strongly believe that it is easier to work in Teams environment among Finnish people if you have met these persons once or twice face-to-face and then start to work on the project." (Interviewee 1)*

To conclude, the importance of trust is seen as critical factor which will strongly and positively affect to the work in the project. Participants are required to trust that others will do their best with their own tasks and conduct those in time without interrupting the processes. Companies need to be ready to act reciprocity and not only enjoy the outcomes but be a part of the process and build trust which can lead to long-term relationships and successful projects. Practices which help with trust-building start with getting to know each other and the best way is to organize face-to-face meetings as it is easier to communicate later in Teams environment when parties have first met also in real world. These practices include open communication, which requires discussions with partners in case of problems occurring and as well in situations in which some party has succeeded in some actions of the process. This provides transparency and helps to build trustworthy environment by sharing openly ideas and challenges in partner's individual progress. It can be said that trust will not be there in day one but will be built during the processes and conversations between the parties.

### 4.2.2 Participant roles

Role of orchestrator is discussed above previously; this sub-chapter will concentrate on the participant roles in the ecosystem and how they have been formed and what have affected to these formations. Interviewee 3 expressed that the roles have been most likely defined in the phase of forming the ecosystem structure based on the company's or operator's capabilities.

> *"[…] these kinds of roles in this joint project have been defined already in the formation of the ecosystem […] roles have been shared based on the characteristics of the company or business." (Interviewee 3)*

Interviewee 5 concluded that the selected roles were quite clear, not too strictly limited but it was clear that what kind of knowledge or resources every participant company is bringing to the ecosystem. Interviewee 4 agrees with the previous statement of the clear roles and explains that they had visualized all the connections between the participants and their own projects to have wide, clear overall picture.

> *"I would say that the roles were quite clear. They were not too strict and limited, but the fact that what each participant brings to the whole ecosystem, yes, I think it was very clear […]" (Interviewee 5)*

> *"Clear roles are part of the ecosystem, and I remember that I have drawn connection pictures, where were all our sub-projects and then other firms' and then that these companies are part of these sub-projects and then these others in these, and everyone had different roles." (Interviewee 4)*

Roling in the ecosystem is mostly conducted at the formation stage, as participating companies should have some kind of advantages which would be beneficial to the ecosystem and its processes. Therefore, careful planning should be done in the formation phase and then have every participant to have some planned role to adjust to the ecosystem. It is important that companies are not only working on the limits of their roles, but they are eager to adapt and be flexible to fulfil the requirements of the ecosystem processes which enables them to exceed their expectations and by learning expand their knowledge. One good example of suitable practice could be to build visualized chart of the company placements in the structure of the ecosystem and show in visual form how different companies are connected to each other. This can help to understand the whole picture of the ecosystem and the company roles.

## 4.3 Integrating in ecosystem

In the integrating phase, the previously collected information and adjusted processes will be integrated to be part of the ecosystem functions and strategy. This can happen at a group level, which in ecosystem can be in the specific company or group of certain

participants, but also organization level can take some new processes into use. In detail this can mean new cooperation activities or reconfiguring resources and then these innovation processes will be adjusted according to the need of the ecosystem. Important dynamic capability in this stage is ecosystem's ability to adapt the changes caused in the way of working and environment.

### 4.3.1 Way of working

Ecosystem collaboration is based on the relationships between the participants. It might be that some participants have never cooperated, which increases the need for events in which participants can get to know each other and start building relationships. Interviewee 1 mentioned that they had opportunities to get to know each other and learn about participant companies. This has been organized as well as with their own initiative, which indicates that participants have been eager to know more about their partners in the ecosystem. Interviewee 4's mention that visits supports the vision that participants had opportunities to meet and form relationships with other participants.

> *"We have had organized as well as own-initiative organised visits and especially within those projects that we have been part of." (Interviewee 1)*

> *"Yes, we did some excursions, even after our project had ended. […] It brings depth to that it exists. […] based on my own career, I know that the more you know about the context, where the products are going to be used, the more efficient the products can be built to meet the requirements […]" (Interviewee 4)*

In the interviews, openness and discussions with other participants has been the most efficient way of working. Interviewee 5 pointed out that collaboration has been contributing to the common things as agreed and highlighted also the meaning of trust and openness in this part. This indicates that good collaboration is based on trust and discussions are necessary to keep every participant on the same page when heading towards the positive outcome. Interviewee 3 recognized as well the successful collaboration within this project compared to the previous experiences.

*"[…] as afterwards now I am thinking about what the cooperation has been and what it is, I would say that it is contributing to the common things as has been agreed together, discussions about the outcome that we are willing to end up […]. But I would say that cooperation is confidential and open. Then the discussions will take the matters forward. […] you can say that we are not ready to proceed with this matter or accordingly with this matter we can proceed." (Interviewee 5)*

*"[…] this project surprised positively by the active collaboration and how companies and research institutions played at the same goal. […] exceptional collaboration and co-development." (Interviewee 3)*

According to the interviews, the most common way of working in this ecosystem has been different workshops and meetings. Interviewee 4 mentioned that workshops are familiar way to conduct work for them as well as Interviewee 3. Interviewee 2 highlighted that sharing experiences in these workshops was important to see if those could have benefitted any other participant. Interviewee 5 emphasized that company visits, face-to-face meetings and all the project-related meetings were important to develop and learn from the collaboration actions.

*"[…] way of working can vary depending on the content and as mentioned previously, different methods complement each other. […] Workshops are familiar and safe way for us to work." (Interviewee 4)*

*"Well, we have had quite many workshops, which have started by specifying that what we are doing and then different people in different phases of the project have been involved to the development process." (Interviewee 1)*

*"[…] workshops in which every participant joined, were important for experience-sharing and when those had links then other participants could benefit from those as well. […] physical meetings did not occur that often but then in Teams there were more regularly meetings, which were not that deep-diving compared to face-to-face meetings, in which participants could take more co-developmental approach and then Teams meetings were more for information-sharing purposes." (Interviewee 2)*

*"[…] well-organized learning opportunities include company visits, face-to-face meetings and all project meetings. […] there should be enough common*

*workshops where you can meet everyone and show your results. It is so that if you do not share your results and learning outcomes and how it could benefit different participants, it will not be successful in the future." (Interviewee 5)*

Interviewee 4 concluded that different way of working -methods are complementing each other as they provide wider overlook of the situation, which then leads to more specific solutions. Interviewee 5 highlighted that different participants require different learning as well as collaboration methods and the importance of working with each other when more than one company is working towards the same outcome, even when different parties have own targets in addition, it is the best enabler for collaboration. Interviewee 3 is also mentioning that communication between the members is necessary as the learning happens through the development work.

*"I would say that different ways are complementing each other. If only one way is chosen, it can give narrow picture of the things then." (Interviewee 4)*

*"And there should be different options for the reason that people are different, and companies are different and then time is also different." (Interviewee 4)*

*"[…] in this kind of larger project, it is great that companies will get the intention, and collaboration will be in a new, different position and it is like one value in the project." (Interviewee 5)*

*"[…] largest learning occurs through the development work, which can mostly be the learning in practice […], it is important that we understand our typical customer companies and their needs, and this understanding rises during the discussions and co-development process. […] greatest learning occurs around the development phases that we do work together that what the other party needs and how we can help with it." (Interviewee 3)*

Information sharing is extremely necessary in this kind of collaborative environment which eagers towards new learning outcomes and innovations. Interviewee 1 states that they preferred the smaller project groups inside the larger entity due to the confidentiality of the information. Interviewee 2 mentions that during the ecosystem project different participants were involved in different stages as it has been so long and wide project which causes the division.

> *"[…] we shared some information with our main collaboration company that we did not want to share with the whole ecosystem, because it included confidential details that we went through. Like with concrete numbers and concrete things. And then on the other hand, some other participants […] might not have any interest for this information […] or time to participate and concentrate our project details as they had their own sub-projects and targets inside the main project." (Interviewee 1)*

> *"Yes, it was clearly divided. This was long project and then some parties in different work packages were ready a lot earlier than others. […] it is so wide project, which causes inevitably the division. […] the project doesn't require everyone to do the same things all the time, which of course gives certain freedom." (Interviewee 2)*

Interviewee 1 describes the collaboration inside the ecosystem as follows, which explains the different sub-projects and links between the participants that are not all co-operating with each other:

> *"But when you look at the orchestra, the leader of the orchestra would tell you what music is going to be played but then the individual instruments would sort of play to that beat, but they would play different tunes, and they would have different instruments." (Interviewee 1)*

With above quotes and notes, it can be combined that different companies require different way of working based on their company preferences. Mostly all collaborative actions have happened in workshops or meetings, which have resulted in a positive way according to the interviewees. Getting to know the other participants and their company's has positive impact on trust, which then helps collaborative actions and lowers the threshold for expressing participants own ideas and comments. Therefore, it would be necessary and practical to organize face-to-face meetings, or company visits in which participants can introduce themselves. Interviewees also agreed that having smaller sub-projects inside the whole ecosystem provided closer and more trustable environment for the development processes, which enhanced more detailed learning experiences. These smaller meetings with closest partners can also be determined to be suitable practices for ecosystem learning. Meetings are generally enabling active collaboration and

communication between the attending participants and helps to ensure that everyone is on the same page.

### 4.3.2 Targets

Setting up targets for the ecosystem is necessary to be able to determine its success. In this ecosystem, interviewees explained that there were targets for the whole ecosystem, the projects inside the ecosystem as well as the individual companies had their own targets for this project. Interviewee 2 discussed that they did form targets for the ecosystem in the beginning quite well, but in this kind of collaboration environment the targets will modify throughout the project.

> *"[…] we did pretty well form the targets in the beginning, but then of course in this kind of cooperation we do a lot of things which bring new possibilities and opportunities on the way and then we take the chance, […] noticed that we could get extra benefit from that. […] it was in a way enabled by this open cooperation that everyone didn't only concentrate on to their own part but understood the object of the wider collaboration aspect." (Interviewee 2)*

Interviewee 1 explained that it is important to have also company-specific targets in addition to the whole ecosystem as the resources are limited in each company, it is necessary that the used resources can help to learn and make progress for the company's processes as well. Interviewee 2 was on the same page that companies have their own targets as well, because it was part of the nature of the ecosystem project. Interviewee 5 mentioned that they did not have any numeric targets in the beginning, only wider packages and the final target cleared during the process.

> *"We have always had also company-specific targets that when we are participating in this kind of ecosystem, we quite clearly determine what we as a company are looking from it. We have limited resources in use, in financial point of view as well as personnel, so because of that we are developing our own activities along the ecosystem." (Interviewee 1)*

*"[…] of course, every company had their own targets, due to the nature of the ecosystem, as well as project plans which might not been public, […] as they are company-specific" (Interviewee 3)*

*"Those were broader entities withing which development was sought, […] no numerical targets or anything that we should increase the number of meetings to X. […] common target cleared during the process." (Interviewee 5)*

From the interviewees answers can be retrieved that mainly the more specific targets were shared between few companies who worked together and created the developments. This was mainly because of the limited resources, and it is easier to cooperate with each other than trying to reach the targets alone.

*"[…] targets started to become more between company and company, and they shared common target, so that inside the ecosystem project were several different projects between few companies. […] worked together for development […]. Collaboration in the end became reality through these bilateral projects" (Interviewee 3)*

*"These work packages have clear targets, which included more than one company's target. […]. It is hard to do it alone, so I think that these packages are the best enablers for collaboration." (Interviewee 5)*

Targets are important to determine the direction of the ecosystem. These targets can be wide and not including detailed numeric targets, but they provide a base and direction for the ecosystem, and this enables modification of the targets along the way to better meet the needs. Company-specific targets should be defined before deciding to attend as that determines if the company has enough willingness and motivation to continuously improve their processes and performance. Sub-project specific targets should also be chosen with the participants.

## 4.4 Institutionalizing in ecosystem

In this stage of the learning process, the innovations and processes that have emerged should be stabilized into ecosystems existing processes. Therefore, it is necessary to

constantly develop and search for the most suitable innovation for the ecosystem requirements. The ability to be flexible provides better options for constant development and learning. This can mean new partners that bring their capabilities into the ecosystem or new values and rules that enhance the successfulness of the processes.

### 4.4.1 Own activity

Several interviewees highlighted the importance of participants' own activity. When discussing resources, Interviewee 4 pointed out that own activity is one of the most important factors when working in ecosystems. Participants are required and encouraged to be active to have all the necessary support they need to succeed. Interviewee 3 and Interviewee 5 are in the same page with Interviewee 4, by impressing that every participant company is responsible for requesting the resources and every participant had opportunity to have discussions with the orchestrator and by that increase the knowledge.

> *"[..] in this kind of ecosystem or project, there must not be passive, but participant needs to actively demand the required resources." (Interviewee 4)*

> *"You need to be active. If you don't invest, you cannot expect that any other participant will bring you something." (Interviewee 5)*

Companies should have own interests to develop the project in addition to its activity. Interviewee 1 stated that if company does not have any own interests towards the specific project or action, it will not be able to develop. Interviewee 5 has similar thoughts that everything starts from noticing own need for something. This highlights that not every company has interest to every part of the ecosystem, but they need to be eager and interested of those parts that they are participating to be able to learn from the process.

> *"[…] if the company doesn't have any own interests to develop something, it will not develop. You can hear what others are doing, and in good time learn something, but if you want to develop your own activities in the ecosystem, you need*

*to be interested as a company about the topic under development." (Interviewee 1)*

*"I would say that all this kind of cooperative way of working, like in this, it will begin from own need to have the motivation exist to take things forward […]" (Interviewee 5)*

To conclude, own activity is playing quite large role in ecosystem learning. Willingness to learn and be active are in strong contact with each other and interviewees highlighted that it is important to have the courage to demand the resources that are needed to succeed within the project. This might be one of the capabilities that is learnt through experience, but it is necessary and therefore important to mention in this part of the model. Best practices to show own activity is to eagerly ask questions and demand resources if needed and have discussions with the orchestrator who can provide their own view to the certain topics and that can help to brainstorm the ideas for further developments. Participants should also specify to themselves that why they are attending to the ecosystem and what is their main interest and end come of the participation.

### 4.4.2 Determined progress

Part of the institutionalizing phase is to build stabilized processes which enable the continuous improvement and development of the ecosystem. Interviewee 4 highlighted the importance of weekly meetings, especially when things were on-going and were required to contribute quickly and mentioned that the closest collaboration partners had meetings with a smaller group to ensure that everyone is on board and discussing about how to proceed.

*"[…] when we were so-called execution phase, then for example the importance of weekly meetings is highlighted because at that point was required that things will move forward rapidly, which was suitable for that phase." (Interviewee 4)*

Regular meetings with the partners of the closest collaboration were pointed out by Interviewee 4 and Interviewee 5 also brought up the importance of reporting the process status which also guarantees that the project is proceeding within the schedule.

Interviewee 1 stated that Teams meetings have been playing meaningful role as enabler of these regular meetings as it has been easy to participate from all over Finland.

> *"[…] we had kind of meeting series with the closest partners, where we discussed of what we are doing, and these had quite few participants. […] it was kind of one-to-one discussion between companies about the next step." (Interviewee 4*)

> *"[…] for example, this kind of project team meetings regularly will force you to report regularly and with certain pattern, […] which will ensure that the project is proceeding." (Interviewee 5)*

> *"Teams enabled that it was possible to have weekly and monthly meetings with people from different places, which was relevant way after getting to know the people" (Interviewee 1)*

All the interviewees were highlighting the importance of regular meetings with some kind of structure. These will enhance the productivity of the meetings as well as the outcomes and understanding of the next steps will be clear to every participant. Regularity will also provide schedule, in which the companies are required and responsible to fulfil their tasks. This will help to reach the target as well as build the trust among the partners, because when everyone is participating the weekly meetings and completing the required tasks on time, the environment will become more trustable as every partner is participating and investing time to the project. As short Teams meetings are today easy to arrange in short notice, additional meetings can also be successful addition to the progress in rapidly progressing phases and keep every participant informed of the status.

## 4.5 Intertwining in ecosystem

Intertwining is the fifth and extended step to the model and in this step the processes are integrated together, and necessary information is being shared within the participants in the ecosystem. These participants include the ecosystem partners, but also external partners. This step is important especially in ecosystem context as in ecosystem every action cause change in other participants processes and sometimes the necessary

knowledge is not found inside the ecosystem, and it is required to search for external expertise. Therefore, this step can provide opportunities to create new relationships to connect with the ecosystem or strengthen the already existing cooperation within the ecosystem, which then enhances the new information flow and knowledge-sharing and helps the learning process continuity.

### 4.5.1 External partners

Even though this ecosystem included companies with various expertise and knowledge, also external partners were participating, which is part of the open innovation ecosystem structure and way of working. Interviewee 1 mentioned that when the need for external expertise occurred, they were helping to solve certain, specified issues. According to Interviewee 3, the knowledge that the internal participants did not have, but was brought up to the processes by external partners, gave possibility to learn and increase the internal knowledge about the topic.

> *"And then there has been external partners that they do some specific part of the project. […] we buy the special expertise from external partner for a certain area. […] For instance, getting the expertise from universities, or other SME's or bigger global actors for the project" (Interviewee 1)*

> *"[…] of course, getting expertise from outside of the ecosystem to get new knowledge inside and then the learning occurs […]" (Interviewee 3)*

Interviewee 4 also added the role of orchestrator with the external partners and how it enabled the learning from outside sources by comparing different ecosystems to this case ecosystem. Interviewee 2 mentioned that these external partners gave the ecosystem the opportunity to spread and build new relationships regardless of the ecosystem boundaries.

> *"[…] orchestrator kind of searched for the examples of other ecosystems and forwarded information and had discussions with other parties." (Interviewee 4)*

> *"[…] there were other participants who came along as service providers and through these providers the network expanded beyond those partners who were involved from the start." (Interviewee 2)*

These presented comments from internal partners regarding external expertise highlighted that it is not necessary for ecosystem to have all resources. When ecosystem can be receptive and open, it enables a lot wider opportunities to develop the processes and by learning from external partners increase the knowledge these partner companies have. Good practices to benefit the external partner resources is to have discussions and by that build relationships with them to get access to the missing internal knowledge and by cooperating with external partners is the one of the best ways to learn as they can provide outside perspective on different situations. Orchestrator plays important role to connect ecosystem partners with external partners and they could also provide examples of other different ecosystem structures and their ways of working. Interviewees see this more as possibility than threat, which indicates their openness will learn and increase the knowledge.

## 4.6 Summary of findings and revised framework

To summarize the findings from the interviews, learning in this kind of ecosystem context will occur already in the first phases of the learning process. Everything starts with participants own motivation, without willingness to develop and learn or own interest about the project, it is hard to stay consistent with the process and end up to successful outcomes. If the motivation is missing, most likely the participant cannot see the advantages of their participation, which decreases the productivity and affects to other participants as in ecosystem structure everything is connected to each other. Therefore, motivation is seen as one of the key cornerstones for successful learning processes in case ecosystem.

One key factor that can be seen from the results is the roles of the different partners in the case ecosystem. Orchestrator, which keeps everything in place and provides guidance to the ecosystem as well as individual participants to keep everything in right track.

As the orchestrator has the previous knowledge or experience working with ecosystems that some participants do not have, this also provides some kind of security and safety for the participants that they can discuss with orchestrator in case of any trouble or questions. By providing regular weekly letters and informing updates to participants, orchestrators knowledge can be fully utilized and shared as learning opportunity to the participants.

Participants and their roles are mainly based on their expertise and experiences, which are mapped to have right partners in right projects to get most out of the projects that the ecosystem is planning to conduct. Roles should not be too limited, but they can give some guidance of their capabilities and knowledge that they can teach to others. Mostly the determination of the roles will occur inside the ecosystem, but it is important to notice that also external resources might be used, which can widen the ecosystems expertise and therefore these external partners can have essential role for providing some knowledge that is required for the successful implementation in the ecosystem. One suitable way of communicating the structure of the roles is to have visualized chart with connections within the ecosystem, which benefits different parties to comprehend the ecosystem as a whole.

Importance of trust has been highlighted among the participants. When building an ecosystem, there can be trust between some participants that have previously worked with each other, but mainly it is needed to be built from the scratch. Trust is seen as a base for successful cooperation, which will be the result of every partner doing their part as well as possible and be active, which shows others their motivation and willingness to develop and work with the ecosystem partners. If the participants will not have initiative approach, it is hard for others to trust them as they do not know if the participant is motivated enough to conduct wide projects. Good practices to enable trust-building in the ecosystem is to openly communicate and have discussions of challenges and acknowledged outcomes, which can help other participant to enhance their processes and give suggestions to them how they can further develop their processes. Face-to-face

meetings are helpful to create the base for relationships and benefits further, maybe shorter communication that is conducted by having Teams meetings or phone calls. Also, having follow-ups constantly will enable more trustworthy environment between the members. When the trust has been built, the learning will happen easier as the partners are more confidently sharing information and knowledge as they have the trustworthy environment to do that.

Discussions, visits and workshops were emphasised as successful ways of working. As in the ecosystem the collaboration and cooperative atmosphere is in the centre of attention, it is required that the actual work with the project is also happening in cooperative manners. Different kinds of discussions and meetings will enable trust building, which then provides a possibility for learning in the different phases of the projects. It is important also to select correct way of working according to the requirements of the project and the participants. Some will be more fruitful than others, and not every way of working is suitable for everyone and every case. With this case ecosystem face-to-face meetings as well as working in Teams were highlighted, as well as company visits which enable to learn more about the partners and their businesses. When conducting workshops as a development and learning opportunities, it is important to have clear understanding of what is the intendent outcome of the session and how it will benefit participants and in which way or form the results will be shared to others. Information-sharing is one of the key factors for learning and therefore it is necessary to have guidelines of how the project is divided to sub-projects and work packages, and what is the way of communicating the new learning outcomes to the other participants in other work packages. As a result, it can be said that regular meetings to share necessary information will provide great opportunities for determined progress in the ecosystems projects.

5I-model in the ecosystem context provides overview of the main factors influencing in certain step of the learning process. The model presented in Table 5 above, presents continuous learning with feedforward and feedback learning flow. Feed-forward learning flow helps the ecosystem to prepare partners for future challenges and opportunities.

For instance, different planning options and scenarios can provide information flow that prepares companies within the ecosystem for the possible upcoming challenges. Feedback learning flow concentrates on past challenges and mistakes. By reviewing what has happened in the past, it helps to learn and prepare better solutions for similar challenges that might be possible in the future. This also improves future performance as the organization learns from its mistakes or decisions that have not provided as good outcome as could have been possible. These two learning flows provide constantly ongoing, step-by-step processes of learning, which helps organizational learning. This betters ecosystems opportunities to be aware for the future but also to prepare solutions and risk managements for similar challenges that it has already faced in the past.

| **5I-model in ecosystem context** | | | | |
|---|---|---|---|---|
| Intuiting | Interpreting | Integrating | Institutionalizing | Intertwining |
| Motivation, Role of the orchestrator | Building trust, Role of the participants | Way of working, Determining targets | Own activity, Determined processes | Role of external partners |

Table 5: 5I-model in ecosystem context

Below Table 6 presents the revised framework of this study and includes the learning practices for ecosystem. Different communication practices are in extremely important role in learning process and open communication will enhance the trust-building between the participants.

| | 5I-model (learning process) | | | | |
|---|---|---|---|---|---|
| | Intuiting | Interpreting | Integrating | Institutionalising | Intertwining |
| Ecosystem structures, investments, capabilities | Participant own motivation<br><br>Determination of the reason why to attend<br><br>Sharing experiences from previous ecosystem participations<br><br>Orchestrator to share its knowledge in formation phase<br><br>Determination of required resources | Introduction meetings<br><br>Discussions between the participants<br><br>Face-to-face meetings to build trust<br><br>Open communication<br><br>Visualize the ecosystem structure and connections | Company visits between the participants<br><br>Workshops, Teams or face-to-face meetings<br><br>Regular meetings with closest partners<br><br>Selecting and modifying the targets<br><br>Active collaboration and development | Discussions with the project participants and with orchestrator<br><br>Additional short Teams meetings<br><br>Schedule status reporting<br><br>Actively presenting questions and demanding resources | Orchestrator to present external partners<br><br>Discussions with external partners<br><br>Benchmarking other ecosystems |

Table 6: Revised framework with learning practices

# 5 Discussion

This research was conducted to answer the following research question: “What are the learning practices that take place in collaborative open innovation ecosystem?”. As mentioned in the previous findings, several key practices that enable successful learning in ecosystem were highlighted by the interviewees and in this chapter the results will be compared to the theoretical review. Theoretical implications will be presented with five stages which present the gradual learning process which can be seen in revised framework in Table 6.

## 5.1 Theoretical implications

1st Stage - Intuiting

The first stage of the 5I-model, intuiting, included motivation and the role of orchestrator. Results show that these both are in extremely important and appreciated role when it comes to ecosystem development and learning. Following paragraphs will summarize and combine them to the framework.

Motivation is one of the main factors to join ecosystem, because personal interest is critical to be persistent with the learning process (Danatzis et al., 2022). The results show that participants in case project see motivation as a one of the key factors towards successful cooperation because participation is voluntary and ecosystem partners most likely are joining because they have the need and motivation for it. Rodrigo and Palacios (2021) highlighted that working together in ecosystem is reciprocal, which can also be seen in the results of this analysis. Interview results show that participant companies are required to invest in the processes to be developed and as they continue this process, they will receive something relevant back in the cooperation. However, the data also mentioned that the information-sharing should not be only transactional and based on contracts, but rather real and natural cooperation, which would then make it more open and approachable.

The importance of the role of orchestrator was clearly highlighted in the results as participants appreciated that the guidance needed was available for them provided by the orchestrator. As Huang et al. (2020) mentioned, the orchestrator manages the vision and helps to guide participants towards the successful ecosystem processes, it can be noted from the results that these actions provided by the orchestrator are positively noticed and appreciated among the case participants. Results show that the competence and experiences that the orchestrator has, are highly appreciated in the case project, and it was seen as one power that kept everything, and everyone included in processes.

When including these two first factors, motivation and the role of the orchestrator, into the above presented revised framework, it shows that companies willing to participate in ecosystems are required to review their own intentions and find out what are the factors that motivate them to join, what they are willing to reach and how much they are able to invest to the cooperation with other participants. Also, the orchestrator has been in large role in case project and therefore it would be necessary to have orchestrator on board already from the first steps of the ecosystem as it will provide expertise for instance with selecting suitable partners or building some main processes. It can be said that finding the motivation and finding ways to keep every participant motivated is required to enable learning in the ecosystem. Orchestrator should concentrate to motivate the environment by sharing the developments created within the projects or in the working environment, so that every participant has the view of the full picture and might find extra motivation and ideas to continuously improve their own process. As the results highlighted the importance of companies own motivation and the role of orchestrator are one of the key components for successful ecosystem, these have been included in the first stage of the framework as they are required to be determined in the beginning of the learning process.

2nd Stage – Interpreting

The second stage, interpreting, emphasized the importance of trust and the determination of the roles of the participants. It can be seen from the results that trust-building

will begin after starting to work with other participants and the roles for every company have been determined, which means that the companies are aware of who will be their main cooperation partners. Next paragraphs will shortly combine theory and results and include these factors to the framework.

Steinbruch et al. (2021) expressed in their research that trust has a critical role among the ecosystem participants, which is required to have successful and innovative outcomes from the processes. For companies to learn from each other, it is required to relationship building (Huo et al. 2022). Good practice to build sustainable base for relationships is to have face-to-face introduction meetings where participants can discuss and get to know each other, especially as today the most daily communication will happen in online environments. Results also underlined transparency in addition to trust as a great enabler for learning and this is in line with Dirani et al. (2021), who determined these as successful learning factors. When companies are committing and investing to the ecosystem, it will enhance the trust-building between the participants (Tsvetkova et al. 2017) and this was also highlighted by the interviewees, who mentioned that participants need to be able and willing to invest time and resources to enjoy the results within the trustworthy environment. If they are not investing, they cannot expect to benefit from the outcome. Therefore, it can be beneficial to have follow up-meetings where every participant can share their progress, which then gives better opportunity to build sustainable and trustworthy relationships as participants can see that every participant is proceeding and conducting their tasks.

Results presented that roles for the participants were quite well planned before starting the ecosystem. This was mainly because the participants are having similar issues and looking for to develop the processes in their industry. As Adner (2017) presented, every participant in the ecosystem will be influenced by others and their capabilities and resources and therefore their capabilities may change in the process of ecosystem development. It is necessary for successful collaboration and learning that each participant has clearly determined role (Adner, 2017), which is based on their strengths and

knowledge (Tsujimoto et al., 2018). This was clear with the case ecosystem that companies were divided into projects based on their own motivation and targets, which indicates that it will outcome in a more successful way when the capabilities have been considered. Suitable practice to enhance the understanding of the role structure would be to have chart, in which participant companies are defined and connected to each other according to how they are participating in the project.

As the second stage is interpreting, it means that companies have their roles in the ecosystem stated and they start to build relationships with each other. Trust is in extremely important role when it comes to collaboration and therefore it is important to start making relationships with other participants in early stage, especially with the partners cooperating within the sub-projects. To learn with the partners, it is necessary to spend time together, get to know each other and have open discussions about strengths and uncertainties, which show the parties that every company is determined and willing to be part of the ecosystem to learn and develop. When the environment is open and trustworthy for discussions, participants can ask for help with a lower threshold, which can accelerate the progress of the processes when no company is left alone to consider solutions. Due to the necessity of trust and clear roles for the participants, these have been selected to the interpreting stage to successfully start the next stage.

3rd Stage - Integrating

The third stage, integrating, includes target determination and the rules for way of working. The results show that determining the targets clearly, provided clear vision of the progress and established the most suitable methods to conduct the work. Following paragraphs will provide short overview of the targets and way of working and integrate them into the model.

One of the main cornerstones for ecosystem learning is collaboration and its way of working. Felin & Foss (2023) presented those connections between the ecosystem participants is crucial to be able to share resources accordingly. Good collaboration requires

stable ways of working as well as clear targets with common understanding. Results presented that targets were determined in the beginning of the case ecosystem project, and they were modified during the progress, which indicates its ability to adapt to changing situations and participants ability to react and adjust their processes when needed. This practice could be reviewed regularly to see if modifications are required or the targets can remain the same.

Results showed that the most beneficial learning practices for participants in the case ecosystem were different kinds of workshops, discussions that enhanced the knowledge-sharing, regular meetings and company visits. It was highlighted that different kinds of methods to develop and through that learning occurs are required. Tsvetkova et al. (2017) mentions that common understanding about the suitable way of working is required to co-develop the knowledge into new innovations. As everything in ecosystems is based on trust, all the discussions and getting to know each other is important part of the process. These discussions can enable wider understanding if the participants are reaching towards short-term targets or longer-term targets, which may cause deviations between the participants and that should not be the case. Useful practice to avoid deviations in understanding is to have regular meetings with the closest partners to discuss and ensure that everyone is on the same page. Ates (2022) mentions that ecosystem to be successful it should be able to provide long-term targets and participants should be on the same page to reaching those targets. Therefore, the clear understanding through discussions is necessary and communication is key factor for ecosystem to be able to develop and learn (Ma & Hou, 2021).

Above explanations provide short overview of targets and working ways, which have been selected to be part of the integrating stage. As integrating stage already develops new and adjusts the processes, it is important to have clear guidelines in the form of targets (company-specific and ecosystem-specific) as well as ways of working.

4th Stage - Institutionalizing

The fourth stage, institutionalizing, includes own activity and determined progress. The results from data show that participants are required to be actively involved to get the full potential of the ecosystem, and the progress is required to be determined and constantly evolving towards the goal. Next paragraphs will shortly present these two elements and include them to the framework.

Ecosystem participation requires constant collaboration, but to reach the successfully working and collaborative environment, it is obligatory that companies participate actively and are motivated to be part of the ecosystem. Ketonen-Oksi and Valkokari (2019) mention in their research that to develop the ecosystems productivity, it is crucial that participants are actively heading towards clearly determined vision and goal. Results show that willingness to learn and being part of the ecosystem are essential, and they highlight that if company is not active and not investing, it cannot assume that it will receive something. Companies should be active and ask questions and demand resources in case they are required. There must be the motivation and eagerness to get full benefits of the ecosystem cooperation as if participants have common trust and they have built strong relationships, it benefits the ecosystem to become more innovative and successful (Steinbruch et al., 2021). Therefore, participants should have clearly determined the main reasons of why they are attending to the ecosystem as if they have clear goal or outcome in mind, they will most likely also be active to reach those targets.

According to Tsou et al. (2019), it is required that every participant has understood how processes within this ecosystem work and how they are required to proceed with the plans. This highlights the role of planning to reach determined progress within the projects. The results indicate that regular meetings were held to have discussions about the next steps that are required for. In this kind of collaborative environment, it is notable that every change or decision will have effect to other participants (Kohtamäki et al., 2019; Tsujimoto et al., 2018; Rong et al., 2018), therefore it is important to have regular meetings, either in Teams or face-to-face as the communication plays large role in

ecosystem. These meetings provide opportunities for different parties to share their progress and show that they are in schedule as they are conducting these projects inside the ecosystem and therefore every participant is responsible for their own part of the project. This helps with trust-building (Tsvetkova et al., 2017) as well as every party can concentrate their own progress and there is no need to constantly monitor what others are conducting (Theurl & Meyer, 2018).

When learning progress is heading to the institutionalising stage, it already has certain ways of working determined and the next steps are stabilizing the situation and creating common ways to run the processes. Companies are motivated to cooperate and find successful solutions within the ecosystems processes. Activity and determined progress are suitable for this stage as they already have been established and ecosystem partners should be aware of the ways of working.

5th Stage - Intertwining

The fifth stage, intertwining, includes the factor that develops innovation ecosystem to become open innovation ecosystem. External partners and resources are important for ecosystems if they have some specific requirements that they cannot supply by themselves. Following paragraph will connect external partners to the intertwining stage of the framework.

In addition to the participants and orchestrator, open innovation ecosystems use also external sources, which enables ecosystem to use external partners in case some knowledge is available there and not inside the ecosystem (Haukipuro et al. 2023). Results show that in case ecosystem the external resources were able to conduct some parts of the projects, which would not be successful without their cooperation. By collaborating with external partners, the participants of the ecosystem were provided an opportunity to increase the knowledge and learn from the external partners. Aparecida et al. (2022) mentioned that it can be more efficient to benefit from the external resources as they might have necessary technology or solutions available, and in that case

the ecosystem does not need to use its time and resources to inventing something that already exists outside of the ecosystem. In addition to the benefits that ecosystem will receive from this kind of cooperation, it will also provide external partner a way to build relationships with the internal partners and learn from them.

Intertwining stage provides a good opportunity of external cooperation for the whole ecosystem as well as for the ecosystem internal partners and external partners. Orchestrator with previous experience can connect different companies to have discussions and build relationships, which can be seen also as a good practice to succeed with learning in the ecosystem. Both parties will have possibility to build relationships which can lead to successful outcomes in other projects as well. As most likely the external partner will have knowledge that is not available inside the ecosystem, it will also provide great opportunity to learn and finalizes the framework of the learning progress.

## 5.2 Conclusion

As discussed, many interviewees emphasized the importance of motivation, trust and own activity as a key determinants of successful ecosystem learning. It can be concluded that to learn, the starting points required are participant motivation, willingness to build trust and be active and constantly participate (Ketonen-Oksi & Valkokari, 2019) in workshops and discussions, which will enhance the ecosystems result as well as participants own targets. Own activity in meetings and discussions will increase the possibility for trustworthy environment and can lead to better outcomes. In addition to the ecosystem's internal cooperation, the external resources can be providing new necessary information and enhance the internal processes which makes their role also remarkable. When some new knowledge is collected from external sources, it will move to the beginning of the learning process and complete all the stages presented in the revised framework which indicates that learning in ecosystem is continuous process with several different stages.

To answer to the research question of this study: **What are the learning practices that take place in collaborative open innovation ecosystem?** It can be noted that learning in open innovation ecosystem is a step-by-step process, and each step has different factors that are required to be able to successfully proceed to the next step. The main learning practices are different forums for discussions (e.g. face-to-face meetings, Teams meetings, workshops), which also enable to strengthen the relationships and increase trust by having open communication between the participants. Constant reporting about success or failure will enhance the development and collaboration between the participants. Behind these factors are participant's own motivation factors and readiness to constantly be active and arise questions to orchestrator or other participants in case needed. By having possibility to open the ecosystem learning progress by including external partners, the possibilities to learn continue to grow as the possibilities to find new knowledge outside of the ecosystem are quite unlimited.

## 5.3 Limitations

This study is based on one ecosystem case project and the data has been collected only from participants who have taken part in this specific project. Even though some participants might have had previous experiences about similar projects, the data collection is concentrated only to this specific case. There has not been any comparison between similar projects. However, five participants from different companies were interviewed and even though this provided good quality data and understanding of the learning processes in open innovation ecosystem, including more interviewees could have widen the perspective of the results.

## 5.4 Suggestions for future research

As organizations are arising their interest to operate in open ecosystem environments, it gives an opportunity for future research topics. This study concentrated a single case ecosystem and its learning practices; therefore, it would be interesting to broaden the scope by involving other ecosystems as well. That would provide an opportunity to

create comparison between different ecosystems and their learning practices and give an opportunity to research how the learning occurs between the ecosystems and what kind of challenges or opportunities that provides. As this study focuses on learning during the project, it would be constructive to establish similar study in future projects, which could show the possible changes, similarities and development of the learning processes.

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# Appendices

## Appendix 1. Interview template

*Interview is part of master's thesis research. All interviews will be anonymous and confidential. Interview will be recorded if permission is given by the interviewee, but only the author will have access to the recordings which will be deleted after finishing the process.*

**Introduction of the author and the thesis topic and the interview structure**

**Introduction questions:**

1. Do you have previous experiences working with ecosystems? What has met your expectations or have there been any surprise factors?
2. Did you determine some targets in the beginning of the ecosystem development process?
    a. Were they company-specific or ecosystem-specific or both?

**Expertise**

3. What kind of knowledge your company has brought to the ecosystem?
4. What kind of role did your company have during the ecosystem development?
    a. Was the role division process clear?
    b. Did the roles consider participants experiences/not having experience previously working in the ecosystem environment?
5. What kind of knowledge has been beneficial or required in ecosystem development?
6. Do you acknowledge that knowledge-sharing has been open and enabled successful learning processes?
    a. In which ways the successful or unsuccessful information- or knowledge-sharing occurred?

**Collaboration**

*As most of the work has been based on a collaborative environment, the next questions are related to that topic.*

7. How would you describe collaboration in ecosystem?
8. Did the cooperation happen with every participant or was the project divided into smaller groups that cooperated more?
    a. What influenced this?
    b. Do you think that deeper cooperation with selected companies provides better possibilities to learn?
    c. What is the effect of trust in successful cooperation and information-sharing?
    d. How more versatile cooperation could have been encouraged?
9. Did you get to know other companies' operations?
    a. What kind of benefits this has provided in developing the ecosystem?

**Learning processes**

*Next part will include questions related to learning and different methods that have been used in the ecosystem work.*

10. Which has been the most suitable way of developing the processes and learning for your company?
    a. Did some methods happen regularly? (For example, workshops, trainings, consultations etc.)
    b. What kind of workshops? Did they occur in smaller or larger groups?
11. How did the ecosystem record the suitable processes which were found to be working?
12. Did you have meetings where experiences of the new processes or developed/learned things could have been shared?
    a. Do you think these were beneficial to learn?

   b. What kind of other routines occurred regularly?
   c. In which other ways the communication inside the ecosystem work? Did you have direct communication between the participants?
13. What kind of new routines or procedures were developed during the ecosystem development that helped to share information and learn between the participants?
   a. Which were the most suitable for your company's needs? Which were irrelevant?
   b. Have these been emerged to you daily work at your company?
14. Do you acknowledge that resources were divided equally to every participant to have successful learning experience?
15. What kind of cooperation occurred with external partners?

**Closing questions**

16. What are the main foundations for organizations to learn in ecosystem?
17. What kind of learning practices contributed to the ecosystem to proceed towards determined targets?
18. What are the most important factors to continue developing the ecosystem?
   a. What are the future challenges?
19. Will you proceed with the processes developed in the project?
20. Do you have something to add or to comment?

Thank you for the interesting discussion and taking part in the interview.