

Aalto University
School of Science
Master's Programme in ICT Innovation

José Carlos Camposano

Design of Product-Service Systems for Finnish Early Childhood Education and Care

Thesis submitted in partial fulfillment of the requirements for the degree of
Master of Science (Technology)

Espoo, September 14, 2017

Supervisors: Maurizio Marchese, Professor (University of Trento)
 Kari Smolander, Professor (Aalto University)

Author: José Carlos Camposano	
Title of the thesis: Design of Product-Service Systems for Finnish Early Childhood Education and Care	
Number of pages: 75 + 6	Date: 14.09.2017
Major: Service Design and Engineering (SCI3022)	
Supervisors: Professor Maurizio Marchese Professor Kari Smolander	
<p>Over the last decades, the Finnish education system has often reached the top position in international rankings, backed-up by the results of well-established international evaluations such as PISA. Along with the good reputation, there has been a surge in educational tourism and an increased interest in bringing Finnish education into other countries. This thesis aims to provide a deeper insight on the composition of the Finnish Early Childhood Education and Care (ECEC) services and how their packaging, export, distribution, adaptation and execution can be improved with the help of Information and Communications Technologies (ICT).</p> <p>This exploratory study follows an abductive approach, combining theoretical and empirical evidence to determine qualitative and distinctive attributes of Finnish ECEC. It starts with an overview of the national education system, its welfare context, operational characteristics and pedagogical principles. It continues with the analysis of previous academic research related to the productization and export of Finnish education, distinguishing common characteristics and models applicable to the ECEC level. The background research finalizes with a detailed description of existing service theories and their evolution over time, leading into the field of Service Design (SD). This discipline and its key concepts are presented as a holistic and comprehensive approach to model complex product-service combinations, such as the ones found in Finnish ECEC.</p> <p>The second half of the thesis is the exploratory case study of a Finnish start-up that wants to sell an ECEC franchise. The author's own observations while working inside the company are validated through SD workshops to determine the key process areas and stakeholders involved in the current business strategy. Based on the case study and the theoretical framework, the author proposes recommendations for the company and other practitioners, aiming to clarify their offerings and devise an efficient use of various technological solutions that facilitate the export of Finnish ECEC products and services.</p>	
Keywords: early childhood education and care, education export, services, service design, productization, strategy, social informatics	Publishing language: English

Acknowledgements

This thesis marks the end of a journey beyond expectations. I met incredible people, who have given me several reasons to be thankful for. The entire document is already long enough, so I will try to be brief:

Thanks to the people at EIT Digital, for giving me the opportunity to study in Finland and Italy – with shorter stops along the way in Karlsruhe, Eindhoven and Rennes. You have truly opened new doors for many young people like me around the world, allowing us to grow professionally and contribute back to Europe, regardless of our financial or economical limitations.

Thank you Prof. Maurizio Marchese, for accepting the supervision of this thesis despite the remote logistics and the busy schedule. Your encouragement and permanent support allowed me to gather confidence to look for companies in Italy and abroad, explore different project options and still manage to graduate on time.

Thanks to Prof. Kari Smolander for agreeing to mentor a previously unknown second-year Master's student, who moved back to Finland with many initial ideas – but no concrete thesis topics. I am deeply grateful for the prompt revision of my draft, which had a bit too many pages, and from which I got in return very concise feedback. Most importantly, thanks for offering me the opportunity to continue improving my research skills as a Doctoral candidate.

Thank you Benji, for helping me question the actual reasons to enter a Master's program, which in turn convinced me to change countries again. More than once in a lifetime, it is necessary to take a leap of faith and leave everything behind. Interesting life experiences always come out of the toughest decisions, but at least for now I am already a bit tired of moving so often.

Thank you Noora and Jonna, for the trust vested in me to join your world-saving quest. I hope this thesis provides you some practical tools for things to come. Your dedication and perseverance are living examples of entrepreneurship in action, and a great lesson on how to keep a cool head – and above the surface, to avoid drowning in a sea of worries.

Thank you Heikka, for giving me your support and for cheering me up during these last few months. Thanks for the professional career advice, the quick and cheap Finnish translations, and for feeding me with healthy food (and with “un poco” of ice-cream). Without smiling too often, you still brought happiness and some light at the end of this tunnel of work, internship and thesis.

Thanks to all the amazing friends I met during my first year in Finland (...Finland, Finland!), to the friends that I met in Trento, and to the friends that I met somewhere else, before or after. You helped me survive my first winter in the north, accompanied me during holidays that otherwise would have been quite lonely, and allowed me to enjoy some nice moments, even during the most stressful periods of uncertainty.

Of course, thanks to Finland itself, the beautiful country that has allowed me to settle in despite the climatic and linguistic differences. I consign this thesis as a gift – shared with Trento – in occasion of those 100 years of independence. Paljon onnea!

Finally, very special thanks for the motivation to everyone who ever betted I would not last more than a year living abroad.

All of you have made this possible.

Espoo, September 2017

José Carlos Camposano

Abbreviations and acronyms

CRM	Customer Relationship Management
DMS	Document Management System
DRM	Digital Rights Management
ECEC	Early Childhood Education and Care
EdTech	Educational Technology
G-D logic	Goods-Dominant logic
GST	General System Theory
HCD	Human-Centred Design
HCI	Human-Computer Interaction
HEI	Higher Education Institution
ICT	Information and Communication Technologies
IxD	Interaction Design
IHIP	Intangibility, Heterogeneity, Inseparability, Perishability
KPI	Key Performance Indicator
MVP	Minimum Viable Product
OECD	Organization for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PSS	Product-Service System
QA	Quality Assurance
RQ	Research Question
SD	Service Design
SQ	Research Sub-Question
S-D logic	Service-Dominant logic
UCD	User-Centred Design
UI	User Interface
UX	User Experience

Table of Contents

Acknowledgements	i
Abbreviations and acronyms	ii
List of tables	v
List of figures	v
1 Introduction	1
1.1 Background: “The Finnish miracle”.....	1
1.2 Research methods.....	3
1.3 Research objective and questions.....	4
2 Background and related research	7
2.1 ECEC in Finland.....	7
2.1.1 Overview of the national education system.....	7
2.1.2 Characteristics and organization of ECEC.....	8
2.1.3 Curriculum guidelines and methodologies.....	10
2.1.3.1 <i>Participatory pedagogy</i>	11
2.1.3.2 <i>Play-based pedagogy</i>	12
2.1.3.3 <i>Phenomenon-based learning</i>	12
2.1.4 International quality assessment.....	13
2.2 Finnish education export.....	15
2.2.1 Evolution of the education export strategy.....	15
2.2.2 Main characteristics and actors of the education export process.....	17
2.2.3 Modelling of education export services.....	19
2.3 Service design: History, scope and key concepts.....	22
2.3.1 S+D = SD? A holistic approach to the field.....	22
2.3.2 The evolution of service theory.....	23
2.3.3 Integrating design into service.....	26
2.3.4 Service design in a multidisciplinary context.....	27
2.3.5 Main characteristics and working definition.....	31
2.3.6 Key concepts from practitioners’ language.....	32
2.3.6.1 <i>Front-office and back-office</i>	33
2.3.6.2 <i>Service offerings and service outcome</i>	33
2.3.6.3 <i>Participant roles</i>	34
2.3.6.4 <i>Customer journey, service moments and touchpoints</i>	34
2.3.6.5 <i>Servitization and productization</i>	35
3 Case study: WellEdu Fennica Oy	38
3.1 Company presentation.....	38
3.2 Research process.....	39
3.3 Data collection.....	40
3.3.1 Observation.....	40
3.3.1.1 <i>ECEC contents</i>	40
3.3.1.2 <i>ECEC environment</i>	41
3.3.1.3 <i>Educator competences and skills</i>	41
3.3.1.4 <i>Pedagogical leadership</i>	41
3.3.1.5 <i>ECEC partnership between staff and parents</i>	42
3.3.2 Workshop 1.....	42

3.3.2.1	Methodology.....	42
3.3.2.2	Results.....	43
3.3.3	Workshop 2.....	45
3.3.3.1	Methodology.....	45
3.3.3.2	Results.....	46
3.3.4	Benchmarking.....	48
4	Discussion.....	50
4.1	Discussion on the case study process and methodologies.....	50
4.1.1	Challenges and weaknesses.....	50
4.1.2	Strengths and opportunities.....	51
4.2	Discussion on the case study results.....	52
4.2.1	Challenges and weaknesses.....	52
4.2.1.1	<i>Dynamics of the Finnish ECEC export industry</i>	52
4.2.1.2	<i>Trade-offs between revenue and early testing</i>	53
4.2.1.3	<i>Technology design and usage</i>	53
4.2.1.4	<i>Sales process and customer-value fit</i>	54
4.2.1.5	<i>Recognizing the true strategic value of Finnish ECEC export</i>	55
4.2.2	Strengths and opportunities.....	55
4.2.2.1	<i>Uncontested market space</i>	55
4.2.2.2	<i>Technology solutions to improve productization</i>	56
4.2.2.3	<i>Splitting the service offering</i>	56
4.2.2.4	<i>Delivery process of the Finnish ECEC services</i>	56
4.2.2.5	<i>Finnish ECEC franchise package</i>	58
4.3	Recommendations.....	59
4.3.1	Changes and improvements on current products and services.....	59
4.3.2	New PSS supported by ICT.....	59
4.4	Possibilities for future research.....	63
4.5	Final remarks.....	63
5	Conclusions.....	65
5.1	Answers to research sub-questions.....	65
5.1.1	How does the Finnish ECEC system work and what are its unique attributes?.....	65
5.1.2	How to model Finnish ECEC from a services perspective?.....	65
5.1.3	What are the weaknesses and strengths of the current productization strategy?.....	65
5.1.4	What technology solutions can be proposed to improve the productization of Finnish ECEC?.....	66
5.2	Summary of findings.....	66
	References.....	68
	Appendices.....	I
	Appendix 1 : Observation of Finnish ECEC centres.....	I
	Appendix 2 : Questionnaire templates for Workshop 1.....	IV
	Appendix 3 : Workshop 2 stakeholder map results.....	VI

List of tables

Table 1: Structure of the thesis.....	6
Table 2: Steering documents governing the provision of ECEC in Finland	10
Table 3: The "Starting Well Index" categories and indicators	14
Table 4: Education export stakeholders in Finland and their key assets	19
Table 5: The updated foundational principles of S-D logic	25
Table 6: Similarities and differences between IxD and SD.....	29
Table 7: The characteristics of SD, their descriptions and related terms	31
Table 8: List of stakeholders and their level of contact with the case study company.....	47
Table 9: Proposed ICT solutions for the productization and servitization of Finnish ECEC.....	61
Table 10: Comparison between off-the-shelf and in-house solutions	62
Table 11: Stakeholders questionnaire used in Workshop 1.....	IV
Table 12: Stakeholder tasks questionnaire used in Workshop 1	V
Table 13: Case study company stakeholders and their relations	VI

List of figures

Figure 1: The abductive research process	3
Figure 2: The Finnish education system.....	7
Figure 3: Finnish ECEC system for children 0-7 and parental benefits.....	9
Figure 4: The selling process of education export.....	18
Figure 5: Education as a service.....	21
Figure 6: Comparison between the G-D logic and S-D logic.....	24
Figure 7: The four ways to conceptualize SD	27
Figure 8: SD located within the four orders of design and their objects of concern	28
Figure 9: Areas with specialized expertise and perspectives brought together by SD.....	30
Figure 10: The two main components of a service.....	32
Figure 11: The Service System Model	33
Figure 12: The Basic Service Package	34
Figure 13: The solution provider firm	35
Figure 14: The layer model of extended product	36
Figure 15: The servitization process	36
Figure 16: Framework for designing effective PSS	37
Figure 17: The case study process and author's contributions during each phase	39
Figure 18: Participants filling out questionnaires during Workshop 1.....	43
Figure 19: Game board and cards for Workshop 2	45
Figure 20: Participants filling out the stakeholder map during Workshop 2.....	46
Figure 21: Creation of a unified stakeholder map for the case study company	47
Figure 22: Unified stakeholder map for case study company	48
Figure 23: Front-end and back-end of Finnish ECEC services	57
Figure 24: Service outcomes of the Finnish ECEC franchise package	58
Figure 25: Sample packages of ECEC services: Basic, full and custom.....	59
Figure 26: Combined PSS framework for Finnish ECEC.....	60
Figure 27: SWOT matrix of the Finnish ECEC productization strategy.....	66
Figure 28: Finnish maternity and child health clinic (neuvola).....	I
Figure 29: Fenced preschool outdoors with playground and green areas	I
Figure 30: Preschool classroom interior.....	I
Figure 31: Dollhouse play area	II
Figure 32: Exercise area.....	II
Figure 33: Reading and relaxation area.....	II
Figure 34: Stage for artistic performance and audiovisual contents	III
Figure 35: Play area.....	III
Figure 36: Play area.....	III

1 Introduction

This chapter provides the background information for the present study and outlines its main objectives and research questions.

1.1 Background: “The Finnish miracle”

Finland declared its independence from the Russian Empire the 6th of December of 1917. During its first years as an independent nation, the country was divided into two factions with opposing visions on how to run the new state. Industrial and agrarian workers confronted the wealthier land-owners and peasants (Aalto, 2006) and entered a Civil War that wiped out more than 1% of the population (Yle, 2016). Several laws were passed in the next few years, giving shape to its Nordic welfare state as it is known nowadays. The reforms considered aspects such as land distribution, securing free education for all citizens, and providing healthcare services for children and new mothers (Tenz, 2017). Social progress stalled once more as WWII started to unravel across the continent and the country entered the Winter and Continuation Wars with the Soviet Union (ibid.). However, despite all the historic conflicts – or perhaps due to the painful lessons they provided – Finland has somehow managed to prevail as a stable country that provides equal opportunities for all its citizens.

One century later, in 2017 the country is internationally known because of its Nokia phones, F-1 racers, heavy metal bands, ubiquitous saunas, extreme weather conditions and its consistently high living standards – among many other aspects. It appears frequently among the top performers in the world across a wide range of international rankings, landing for instance the second place among 133 countries in terms of social progress (Social Progress Imperative, 2017), the first place for human capital endowment (World Economic Forum, 2016), one of the first places in the EU in terms of digital economy progress (European Commission, 2017), the fifth happiest country on earth (World Happiness Report, 2016), or the third least corrupt nation (Transparency International, 2017). These are just a few examples among several other categories where Finland gets the spotlight (Statistics Finland, 2017).

One of the main aspects that has been brought to attention in recent years is the national education system, getting high praises because of its quality, affordability, and unorthodox practices such as the lack of homework and assessments for the youngest children (Taylor, 2012). To illustrate this with numbers, a survey performed in 2016 by the expat community website InterNations asking the question “*How satisfied are you with life abroad in general?*” ranked Finland as the best place for raising a family among a list of 45 participating countries (Brinded, 2017). To be included in the list, each country required at least 30 survey respondents raising children abroad, who provided their opinions about different aspects of life on a scale of 1 to 7. The “Family Life Index” addressed criteria such as the participants’ perceptions about childcare and education options, their availability and costs, the quality of the education and the overall family well-being. 70% of expat parents living in Finland ranked the quality of education in the country as “excellent”, compared to the worldwide average of 21%. Furthermore, 74% of them also agreed that the education options were easy to afford (InterNations, 2016).

The quality of Finnish education is not only a matter of perception, as it has been also statistically proven by the results of well-established international evaluations such as the Programme for International Student Assessment (PISA), an international survey conducted by the OECD every three years to evaluate the different education systems worldwide, by testing the skills and knowledge of 15-year-old students in reading, science, mathematics, finance and collaborative problem solving (OECD, 2017). During the early 2000s, Finland was ranked among the best countries in the world, outperforming not only its Nordic neighbours but any other European country (Schatz, 2016, p. 59). The country gained top results in 2000, 2003 and 2006 consecutively (ibid.) and although it slipped a few positions during the latest edition in 2015, it still maintains itself as one of the best performers in the EU and ranks among the top five worldwide (Euronews, 2016).

Countries who would like to replicate the “miracle” of the Finnish education system have long been asking themselves whether all these sustained improvements can be simply attributed to well-prepared teachers, empowered with the empirical and anecdotal evidence on what constitutes the best pedagogical practices. They may also question themselves how big was the role of the local culture and mindset of the population on the

feasibility of this educational model. Furthermore, they would be wondering up to what extent did the political decisions compromise or guarantee its sustainability. On the academic side, one could also argue how much of a structured research process has been applied so far into the current class programme, how often are the methodologies reviewed and updated, and so on.

To answer these questions, educators have poured from all over the world to visit Finland (D'Orio, 2017), trying to discover the secrets of the national success and bring any useful lessons back home. Comparisons between national systems become inevitable (Jackson, 2016) and so these academic visitors have discovered that the differences begin at the earliest stage of education, when children are still going through their very first years of life. Key factors such as the application of scientific research, experimentation and collaboration, the respect for teachers, the importance of playtime and the universality of access to high-quality education are all elements that can be found at the Early Childhood Education and Care (ECEC) level (Weller, 2017) (Economist Intelligence Unit, 2012, pp. 13-15).

While a visit to Finland may be a wise approach to gain insights on how the national ECEC system functions and succeeds in its own local context, it does not explain by itself how can this model be translated into something more tangible and concrete, that may be exported to other nations, generating equally successful results. The main objective of this thesis is to address this latter question, by providing a deeper insight on the composition of the Finnish ECEC services and how their packaging, export, distribution, adaptation and execution can be leveraged with the help of Information and Communications Technologies (ICT). It follows an abductive research approach, based on the combination of existing academic literature and the author's own experiences while working in the field. Both the theoretical knowledge and empirical evidences are used as inputs to address the existing deficiencies and propose new business strategies and technological solutions for the export of ECEC services. Hopefully these ideas will be implemented in the future, to prove that technology represents a cost-effective solution to reach and scale in the foreign markets.

The study begins with a review of the literature that explains the Finnish ECEC system, its characteristics, context and pedagogical principles. The focus is switched into service theory and the discipline of Service Design (SD) as a holistic and comprehensive approach to model effective product-service combinations, such as the ones found in Finnish ECEC. The theoretical research ends with a summary of previous academic work related to the productization and export of Finnish education, both in general terms and in the scope of ECEC, describing its current state of the art from the academic and industry perspectives.

The next part of the thesis is the exploratory case study of a small local company that wants to sell a Finnish preschool franchise. The author's own observations while working in the field are complemented by SD workshops to determine the key stakeholders and tasks involved. Based on the case study and the theoretical framework, the author proposes recommendations to improve the company strategy and presents various technological solutions for the productization and servitization of Finnish ECEC.

It is a strong belief of the author that this thesis represents one of the first initiatives to start conceptualizing in more formal terms Finnish ECEC as an export product. Hopefully, it will help to generate significant knowledge in the fields of Service Design and Social Informatics, allowing any future researcher or practitioner to understand how educational services can be modelled and brought to other countries, opening new doors of opportunities to bring the best from Finland – at least in the scope of ECEC – to the rest of the world.

1.2 Research methods

The purpose of this thesis is to give an insight on the current state of Finnish ECEC export industry and provide recommendations for the design of effective business strategies, supported by ICT tools that facilitate the delivery of products and services. Considering the relative novelty and open nature of the proposed topic, the study is mostly exploratory.

The desired outcomes are descriptions of potential solutions, which can be better defined through a qualitative research approach. (Corbin & Strauss, 2012) define qualitative analysis as “(the) process of examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge”. According to Creswell, this approach is especially useful when the phenomenon needs to be explored and understood because there is little previous research, or when the important variables to examine are unknown beforehand. Qualitative research is often differentiated from quantitative research by its framing in terms of words rather than numbers, or its use of open-ended rather than close-ended questions (Creswell, 2014).

As Dubois and Gadde explain, every research has the main objective of matching the theory with the real world (Dubois & Gadde, 2002). To confront the theory with the practice, there are three main approaches. The first one is the deductive approach, which tests existing theories in the real world, in the form of hypotheses (H) and propositions (P), and then sets its conclusions based on their corroboration or falsification (i.e. H/P validation) (Kovács & Spens, 2005). The second one is the inductive approach, which works the other way around, by using empirical data to generalize findings and systematically generate new theoretical knowledge (ibid.). And the third approach is called abductive, which stands somewhere in between and combines the previous two. It is characterized by the intuitive leap back and forth between theory and practice, referred to as “theory matching” or “systematic combining” (Dubois & Gadde, 2002).

This thesis follows an abductive approach because of its suitability to *expand* existing knowledge rather than *generate* new theory, so other variables or relationships can be discovered when compared to previous literature (ibid.). This process is illustrated by Figure 1. In the scope of Finnish ECEC export, limited knowledge already exists but it is mostly empirical, non-generalizable or dependant on the own experiences and contacts of the actors involved. Furthermore, previous formal academic research has aimed for the broader topic of Finnish education export, or focused mostly on the higher education level.

For the reasons above, a suitable research framework has been structured with a review of existing literature – whenever applicable to the Finnish ECEC export context – and the author’s own experiences working in the field. The empirical evidences are presented in a descriptive case study performed during the spring and summer of 2017 through observations and workshops using service design methods. Both the theoretical knowledge and the empirical evidence are used as basis to address the existing deficiencies and propose new solutions for the productization of ECEC services.

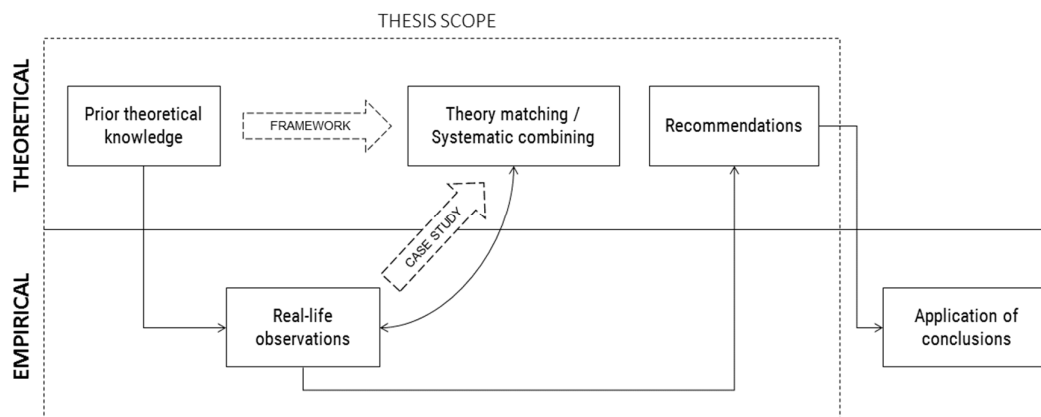


Figure 1: The abductive research process
Adapted from (Toskovic, 2016), (Kovács & Spens, 2005) and (Dubois & Gadde, 2002)

The results of this thesis are presented as recommendations of new business models and design approaches supported by ICT. These ideas can be used to facilitate the understanding of the Finnish ECEC system as a system composed of both products and services, which can be effectively sold and deployed to foreign markets. Because of its abductive approach, this thesis does not aim to generalize findings and establish new theoretical frameworks. It does, however, provide a list of potential solutions for companies aiming to export ECEC services and products under a more consistent business strategy.

1.3 Research objective and questions

The objective of the thesis is described by the following research question (RQ) and sub-questions (SQ):

RQ: How to enable an effective productization and export of Finnish ECEC services through technology?

SQ1. How does the Finnish ECEC system work and what are its unique attributes?

SQ2. How to model Finnish ECEC from a services perspective?

SQ3. What are the weaknesses and strengths of the current productization strategy?

SQ4. What technology solutions can be proposed to improve the productization of Finnish ECEC?

The four SQ above also describe the order of steps that the thesis follows to answer thoroughly the RQ. Each step is linked to a specific goal, which involves various tasks and the generation of some outputs in one or more chapters of the thesis:

1. Identify the distinctive tangible and intangible components of Finnish ECEC
 - Research about the guiding principles, policies and pedagogical methodologies of Finnish ECEC
 - List of key terms, concepts or definitions to be considered in the service delivery process
 - List of services have been turned into an export product so far, or could be exported in the future
2. Model the Finnish ECEC system with a service-dominant logic and using service design methods
 - List of main stakeholders and service touchpoints
 - Map of the service delivery process by separating the front-office and back-office aspects
 - Map of the service outcome by differentiating core, supporting and supplementary services
 - List the Finnish ECEC services that can be enabled or improved through technology as a scalable export product
3. Identify the current strategies for productization of Finnish ECEC, their weaknesses and strengths, from the perspective of both customers and providers
 - Identification of the challenges for customers to understand, adopt, engage with, or use these existing technologies
 - Identification of the challenges and difficulties for the technology providers to reach, teach, or encourage the users
 - Benchmarking of existing solutions in the market for the productization and export of Finnish ECEC
4. Provide recommendations to improve the productization (and servitization) strategy, supported by technological solutions that address the existing gaps and deliver more value to stakeholders
 - Proposal of new strategies for the productization and export of Finnish ECEC services
 - Suggestions to change and improve existing technologies which effectively enable those strategies

Table 1 summarizes the structure of this thesis, its RQ, SQs and goals, the list of tasks with the outputs they produced, and the chosen methods together with the chapters where these were employed.

The academic framework that supports the research process is constructed from three different streams of background literature reviewed in Chapter 2. These sources are: (a) the overview of the Finnish ECEC system, (b) service theory and the fundamentals of service design, and (c) the current state of internationalization and export of Finnish education services.

To keep in line with the technology focus of this thesis, the revision of ECEC literature is expanded only to the extent that allows an understanding of the main methodologies applied in Finnish preschools and their characteristics, required to answer SQ1. A deeper, critical analysis of the psychological, sociological and pedagogical theories is a task better reserved for early education professionals.

Similarly, the scope of research related to services theory and service design methods is limited to the collection of points needed to answer SQ2. This thesis does not aim to model the entire customer journey for all services that may be delivered as Finnish ECEC, but rather use a selected number of tools from the service design discipline to identify the productized service business model or touchpoints that can be enabled with the support of ICT-based solutions, both in their current (i.e. deficient) and desired (i.e. optimal) states.

The review of background information provides the necessary knowledge to partially answer SQ1, SQ2 and SQ3. The remaining information needed to achieve these goals is obtained through the case study from Chapter 3. It describes the situation of small company based in Espoo, Finland, where the author was employed at the time this thesis was written. The information presented is a combination of the empirical knowledge from the author's own observations, two team workshops carried out using service design techniques, and other data collection methods such as market research (i.e. benchmarking).

Chapter 4 contains the discussion about the research methodology and results of the case study. Both are explained in terms of their negative (i.e. challenges or limitations) and positive (i.e. advantages or opportunities) aspects. The case study results are combined with the information from the literature review to recommend changes and propose new solutions which answer SQ4 and the main RQ, respectively.

The conclusions of this thesis are mostly based on the empirical knowledge from SQ3 and SQ4, but they also build upon the theoretical framework established by SQ1 and SQ2. These are required to model Finnish ECEC from a services perspective, using existing literature of both Finnish ECEC and service design. While SQ1 and SQ2 can be positioned in the realm of theory, SQ3 and SQ4 are highly dependent on empirical evidence, obtained from the case study observations, workshops and benchmarking. The combination of both types of inputs, theoretical and empirical, enables to design the potential solutions which address the main RQ.

RQ: How to enable an effective productization and export of Finnish ECEC services through technology?			
Sub-question	Goal	Specific tasks or outputs	Method(s) or input(s)
How does the Finnish ECEC system work and what are its unique attributes?	Identify the distinctive tangible and intangible components of Finnish ECEC	<ul style="list-style-type: none"> - Research about the guiding principles, policies and pedagogical methodologies of Finnish ECEC - List of key terms, concepts or definitions to be considered in the service delivery process - List of services have been turned into an export product so far, or could be exported in the future 	<p>+</p> <p>Literature review</p> <p>2</p>
How to model Finnish ECEC from a services perspective?	Model the Finnish ECEC system with a service-dominant logic and using service design methods	<ul style="list-style-type: none"> - List of main stakeholders and service touchpoints - Map of the service delivery process by separating the front-office and back-office aspects - Map of the service outcome by differentiating core, supporting and supplementary services - List the Finnish ECEC services that can be enabled or improved through technology as a scalable export product 	<p>Theoretical</p> <p>Literature review Case study</p> <p>2, 3</p>
What are the weaknesses and strengths of the current productization strategy?	Identify the current strategies for productization of Finnish ECEC, their weaknesses and strengths, from the perspective of both customers and providers	<ul style="list-style-type: none"> - Identification of the challenges for customers to understand, adopt, engage with, or use these existing technologies - Identification of the challenges and difficulties for the technology providers to reach, teach, or encourage the users - Benchmarking of existing solutions in the market for the productization and export of Finnish ECEC 	<p>-</p> <p>Case study Author contributions</p> <p>3, 4</p>
What technology solutions can be proposed to improve the productization of Finnish ECEC?	Provide recommendations to improve the productization strategy, supported by technological solutions that address the existing gaps and deliver more value to stakeholders	<ul style="list-style-type: none"> - Proposal of new strategies for the productization and export of Finnish ECEC services - Suggestions to change and improve existing technologies which effectively enable those strategies 	<p>Empirical</p> <p>+</p> <p>Author contributions</p> <p>4</p>

Table 1: Structure of the thesis

2 Background and related research

This chapter explains the main concepts that constitute the theoretical framework of this thesis. The information presented here is the result of an extensive literature review from both academic and industry sources and is required to understand the subject of the case study, as well as to enable the formulation of concrete and effective recommendations.

2.1 ECEC in Finland

This section begins with an overview of the entire education system in Finland, describing its overall structure. Later, the focus is switched toward the ECEC level to explain its decentralized and comprehensive approach. The section continues with a review of the current ECEC curriculum guidelines in Finland, its pedagogical methodologies and guiding principles. Finally, the quality of Finnish ECEC is explained through the lens of different international assessments.

2.1.1 Overview of the national education system

The Finnish education system is divided into the following levels: ECEC (ages 0-5), pre-primary education (age 6), basic education (age 7-16), upper secondary education (general and vocational), and higher education (universities and universities of applied sciences) (Ministry of Education and Culture, 2017). Pre-primary education and basic education are compulsory. Furthermore, all levels of education from pre-primary to higher education are publicly funded and free of charge, except for the higher-education level tuition fees for non-EU and non-EEA students introduced in autumn 2016 (Finnish National Agency for Education, 2017).

Figure 2 shows the structure of the entire Finnish education system. This thesis is focused on the productization of services for the ECEC level only.

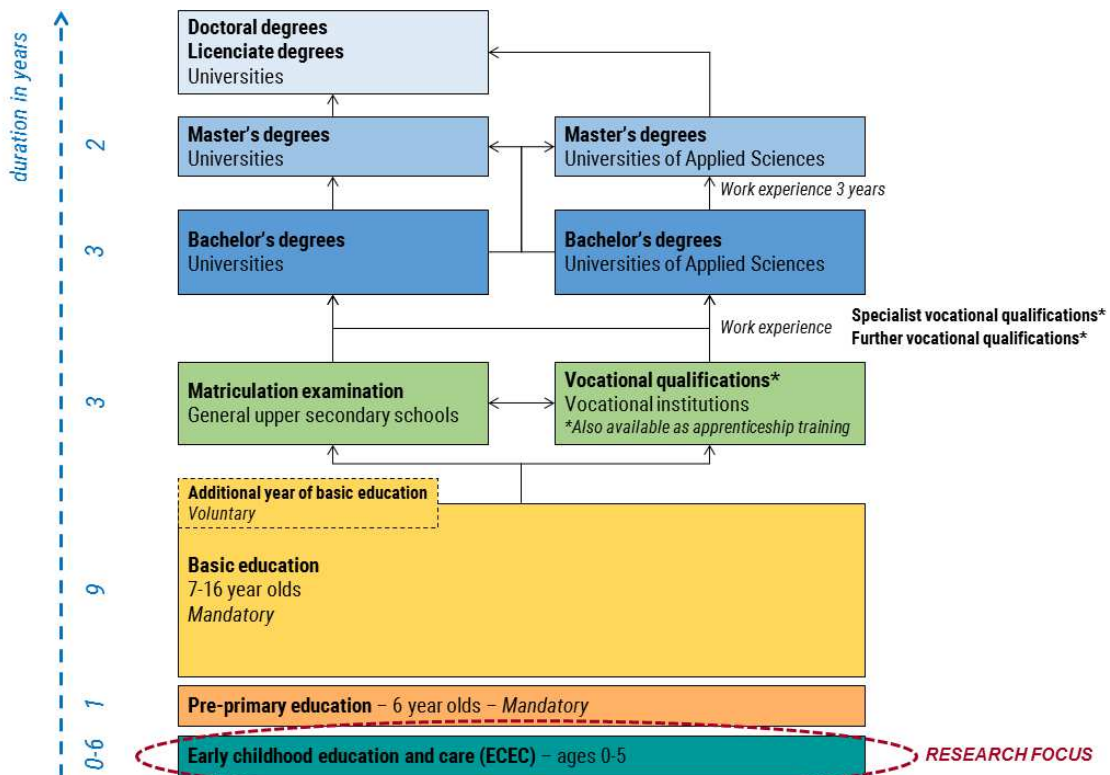


Figure 2: The Finnish education system

Reproduced from (Ministry of Education and Culture, 2017) and (Finnish National Agency for Education, 2017)

The national education administration in Finland is carried out by two public institutions: The Ministry of Education and Culture, which sets the policies, prepares relevant legislation and provides funding; and the Finnish National Agency for Education, which is responsible for the implementation and monitoring of the policies, the preparation of the national core curricula, its qualification requirements, objectives and methods (Finnish National Agency for Education, 2017) (Ministry of Education and Culture, 2017, p. 12).

Since the early 1990s the system has been highly decentralized, giving a predominant role to local governments in the execution and operation of the school units. Municipalities or joint municipal authorities decide on the allocation of public funding, the implementation of the curricula and the recruitment of personnel. They can delegate some of this decision-making power to the schools, such as in the case of budget management, equipment acquisitions or staff recruitment, responsibilities that are usually carried out by the principals (Ministry of Education and Culture, 2017, p. 12). Teachers also have a high level of pedagogical autonomy, as they can determine themselves the teaching methods or the selection of textbooks and materials, for instance. There are no regulations on the class size and group formation criteria, as education providers are free to decide the practical arrangements that better suit them depending on their context (ibid.).

The national core curriculum for basic education is prepared by the Finnish National Agency for Education and reviewed approximately every 10 years. It contains the main objectives and contents for the different subjects, the principles for assessment, welfare, special needs education and students' guidance. It also outlines the general principles for creating good learning environments and pedagogical work approaches. The national core curriculum acts as a framework so the local authorities can develop their own local curricula aligned to the same underlying principles and objectives, but leaving room also for local or regional particularities (Ministry of Education and Culture, 2017, pp. 15-16).

The professional autonomy given to teachers showcases the “culture of trust” bestowed on them by Finnish society (Schatz, 2016, pp. 63-64). Along with the greater autonomy comes also a greater social responsibility, which has turned teaching into a highly-respected and desirable profession. The admission rates for educator instruction programs are around 10% of the applicants for class teachers (i.e. working in the first six years of basic education), between 10% and 50% for subject teachers (i.e. working in the last three years of basic education and in the upper secondary level) and around 30% for vocational teachers (Ministry of Education and Culture, 2017, p. 24), which means that in Finland is more difficult to become a teacher than a lawyer or doctor (Schatz, 2016, p. 64). All applicants are individually tested and interviewed before they are admitted into the programs (ibid.). ECEC teachers require at least a bachelor's degree, while teachers in all other levels must hold a master's degree (Ministry of Education and Culture, 2017, pp. 24-25) (Schatz, 2016, p. 64).

2.1.2 Characteristics and organization of ECEC

In Finland, the participation in ECEC is voluntary for children under school age, should their parents decide to enrol them into the system. In 2014, the enrolment rates were 28% for children under 3 years old, 68% at the age of 3, 74% at the age of 4, and 79% at the age of 5. All these numbers are below the OECD average of 34%, 76%, 86% and 95%, respectively (OECD, 2017, p. 26). These low rates are justified by the various forms of governmental support enabling the home care of children in Finland (Kumpulainen, 2015, p. 8).

The provision, supervision and quality assurance of ECEC services are duties of the local authorities (i.e. municipalities), who must provide day-care centres in one of the three official languages of Finland: Finnish, Swedish or Sámi. ECEC programs are funded primarily by taxation (Ministry of Social Affairs and Health, 2003, p. 16) but also subject to a client fee, based on the family income, the number of children, and the time the kids spend inside the ECEC facilities (Ministry of Education and Culture, 2017). In a full-day setting, this fee may vary between €0 and €290 for public units (Eurydice, 2017), which accounts for approximately 14% of the total operational costs (Finnish National Agency for Education, 2017). For low income families, day care is free (Ministry of Social Affairs and Health, 2004). Additionally, parents can decide for publicly-subsidized, private-run ECEC centres (ibid.) which usually have higher fees (Eurydice, 2017). Over 80% of the children at this level are enrolled in public ECEC settings (OECD, 2017, p. 131).

The right for parents to stay at home and take care of their new-born and young children has also been improved in Finland since the 1960s. Maternity leave and allowance were approved in 1964, while similar benefits for

the fathers were granted in 1978. The period of parental leave is currently around 43 weeks and the law guarantees job protection during the entire leave period (Ministry of Social Affairs and Health, 2004, p. 4). Additionally, since 1985, parents can take care for the child at home and receive child home care allowance until the youngest child in the home turns three years old or enters the municipal day care (ibid.). Half of the parents of children under 3 years of age (i.e. entitled to the home care allowance) opt for taking care themselves of their kids at home (Kumpulainen, 2015, p. 8).

All parents of children under school age have the right to place their children into publicly subsidized municipal ECEC as soon as the parental leave period ends, when the child is around 9 or 10 months old. Since August 2016, this entitlement has been limited to 20 hours per week, but is increased to full-time if the parents work or study full-time, or when it is considered in the child's best interest. Municipalities must ensure a placement for every child within 4 months of application. However, due to capacity constraints, the child can be placed in a different setting than the one originally selected by the parents (Eurydice, 2016). In the case parents decide instead to apply for a placement in a private ECEC centre, the admission procedures fall at discretion of the service provider. Parents are still entitled to receive the child care allowance, regardless of whether they choose a public or private setting (ibid.). Figure 3 shows the structure of the ECEC system in Finland and the social benefits given to parents.

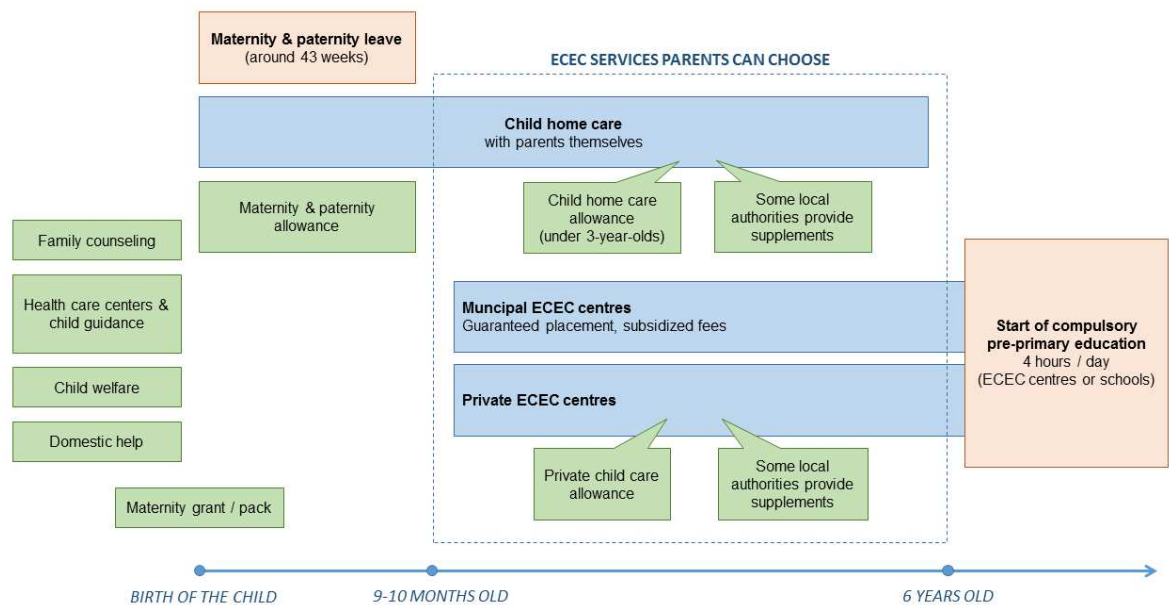


Figure 3: Finnish ECEC system for children 0-7 and parental benefits
Adapted from (Ministry of Social Affairs and Health, 2004) and (Eurydice, 2017)

The adult-child ratio in Finnish ECEC centres is regulated by law. In day care facilities providing full-time service, the ratio is 1:8 for three- to six-year-olds, or 1:4 for kids under the age of three (Eurydice, 2016). In centres operating on a part-time basis, the ratios are 1:13 and 1:4, respectively (Ministry of Social Affairs and Health, 2004, p. 6). If the group size exceeds 13 children, the teacher must have an assistant with at least upper secondary level training. The child-to-staff ratio is an important indicator of the resources invested in ECEC and the quality of the services. A lower ratio indicates better staff working conditions, among other factors such as workload and salary levels. It affects job satisfaction and staff retention, contributing to the quality of ECEC overall (OECD, 2016).

Academic literature has also proven that staff training level and duration are positively associated with ECEC quality (OECD, 2017, p. 103), although the exact relationship between the two is still unclear (OECD, 2012, p. 31). In Finland, one in every three staff members of the ECEC centre must have a post-secondary level degree, such as Bachelor of Education, Master of Education, or Master of Social Science (Ministry of Social Affairs and Health, 2004, p. 6). Although it is not the qualification itself that influences the staff performance

and child outcomes, it is the ability of better qualified staff to create a high-quality ECEC environment what makes the difference (OECD, 2015, p. 132) (OECD, 2012), along with their knowledge of the pedagogical content and practices, and their ability to engage in more sensitive and stable interactions with children (OECD, 2012, p. 27).

Finnish ECEC is governed by various policy documents, both at national and local level, as indicated in Table 2. Some of these documents merely outline the core principles that guide the system, while others are legally-binding or mandatory, such as the latest version of ECEC curriculum, enforced from August 2017 (Yle, 2017).

Level	Document	Year	Content and objectives
National	Act on ECEC and Decree on Children's Day Care	1973 (revised 2015)	Regulates the implementation of ECEC and defines the minimum operational standards
National	Government Resolution Concerning the National Policy Definition on ECEC	2002	Contains the central principles for publicly operated and supervised ECEC
National	National Curriculum Guidelines on ECEC	2003 (revised 2005)	Acts as a framework to promote the same principles, content and quality guidelines of ECEC throughout the country and provides recommendations for the preparation of the local curricula
National	National Core Curriculum for ECEC	2016 (implemented from August 2017)	Basis upon which the ECEC providers must draw up their local and unit-specific curricula and plans
Local	Local policy definitions and strategies for ECEC	N/A	Define the central principles and development priorities in the organization of ECEC services in the municipality and describe its ECEC system
Local	Local ECEC curriculum	N/A	Policy document drafted by one or several municipalities, based upon the National Curriculum Guidelines and Core Curriculum, considering the context, strategies and goals of the municipality
School	Unit-specific ECEC curriculum	N/A	More detailed than the local ECEC curriculum, describing a district's or unit's special features and priorities
Child	Individual ECEC plan	N/A	Drawn up jointly between the professionals and the parents to provide a baseline for the implementation of the child's ECEC

Table 2: Steering documents governing the provision of ECEC in Finland
Adapted from (National Research and Development Institute for Welfare and Health, 2005) and (Eurydice, 2016)

2.1.3 Curriculum guidelines and methodologies

Finnish ECEC is based on an integrated approach to care, education and teaching commonly known by its shorted name as “educare” (Ministry of Social Affairs and Health, 2000, p. 6). The term has been internationally used to describe the model of a Nordic welfare state that combines the educational and instructional perspectives with a complete coverage of the day-care needs of small children (ibid.), such as illustrated by the various components of Figure 3. This model is based on a holistic view of the child's growth, development and learning, which feeds from several streams of pedagogical knowledge, cross-disciplinary information and research, and from the practical expertise on pedagogical methodologies (National Research and Development Institute for Welfare and Health, 2005, p. 12). It implies a systematic, goal-directed interaction and cooperation between families and educators (ibid.), where the child's free and spontaneous play is a central tool of the pedagogical activities (Ministry of Social Affairs and Health, 2000, p. 6).

The National Policy on ECEC establishes that the primary right and responsibility for nurturing and educating children lies within the parents, while public ECEC services merely support the work that parents carry out at home (Ministry of Social Affairs and Health, 2003). Therefore, the dialogue between the educational staff and the parents is fundamental to the success of ECEC. It has been given a predominant role in the National Curriculum Guidelines under the term “ECEC partnership” (Ministry of Social Affairs and Health, 2004, pp. 10-11), which aims to denote an approach beyond co-operation, implying also participation through mutual, continuous interaction in all matters regarding the child. This is achieved for example, by providing parents the opportunity to discuss their child’s education with the whole staff, to participate in the planning and assessment of activities, or to jointly elaborate the individual ECEC plan for their child, considering any special care and educational needs such as rehabilitation (ibid.). ECEC partnership is thus concerned not only with the attitudes from parents and staff but is a conscious commitment in the practical arrangements and organization of ECEC, in such a way that meets the wishes of both parties (National Research and Development Institute for Welfare and Health, 2005, p. 28). This allows an early detection of the areas of child growth, development and learning that need more support, and helps to deal with problematic situations that may arise in the interactions between staff and parents (ibid.).

The National Curriculum Guidelines for ECEC published in 2003 reflect the development and convergence of three main pedagogical approaches applied in Finland: Participatory pedagogy, play-based pedagogy and phenomenon-based learning. These will be briefly presented and explained below:

2.1.3.1 Participatory pedagogy

Since the principal aim of ECEC is to promote the child’s overall well-being (Ministry of Social Affairs and Health, 2004, p. 8), the *view of the child* himself is the core element considered to design the provision of ECEC services. The Finnish methodologies follow the approach of the “whole child” derived from the theories of developmental psychology and sociology. As opposed to the constructivist learning approach, in which the educator provides the information for the child to assimilate and transform into knowledge, in the Finnish participatory pedagogy the child is perceived as a *competent cultural actor* and *active learner*, motivated by curiosity, the will to explore and the joy of realization (Ministry of Social Affairs and Health, 2004, p. 9). This means that the child can shape the learning by himself, throughout systematic and goal-oriented social interactions with other children and adults.

In this approach, teaching is not a one-way information transmission process in which the educator is the “owner of the truth”, but a guide who engages actively with the children as their learning peer and applies a systematic framework to orient the learning process towards specific goals. As the educators interact and discuss with the children, they also get new insights on their thinking and motivations. This information is obtained partially through passive observation. However, it is not enough for the educator to only listen, but also gather information from children’s activities and interpret them to find essential information about their development, interests and competences (Kangas, 2016). These views and interests are then considered by the educators to plan the learning environment and activities, through a negotiation and decision-making process (ibid., pp. 61-63), so the children feel that their opinions, questions, thinking and explorations are valuable, generating a positive disposition for learning (Ministry of Social Affairs and Health, 2004, p. 10).

The National Curriculum Guidelines also describe the design of the ECEC environment¹, which considers various physical, psychological and social aspects. Some of its components are the facilities and infrastructure, the immediate neighbourhood, the psychological and social settings, or the equipment and materials (National Research and Development Institute for Welfare and Health, 2005, p. 17). Educators procure a safe and positive atmosphere for learning, while maintaining a flexibility to adapt its space configurations, so children can feel encouraged to explore and experiment, or express themselves in various ways among other children

¹ The official term used in the National Curriculum Guidelines is “ECEC environment” instead of “ECEC learning environment” or simply “learning environment”. This is a purposeful definition, meant to reflect the specificities of the ECEC level, which is not connected exclusively to learning but also to caring, playing, etc. (Eurydice, 2016) In other words, the term is aligned to cover the overall well-being of the child, main goal of the ECEC model of “EduCare”.

and with the educators. Children are also invited to plan and arrange the spaces or equipment, depending on their themes of interest (ibid.), which denotes another way of application of the Finnish participatory pedagogy.

2.1.3.2 Play-based pedagogy

Another recurrent theme emphasized in the National Curriculum Guidelines is the *joy of learning*. It describes the natural way of children to discover and learn about the world through exploration and curiosity. If they are active and interested, they are also able to make use of all their senses and combine things and situations from their environment with their own experiences, feelings and concepts (National Research and Development Institute for Welfare and Health, 2005, p. 17).

The guidelines summarize this approach in a clever way by explaining that “children do not play with the purpose of learning, (but) they still actively learn through play” (National Research and Development Institute for Welfare and Health, 2005, p. 19). To achieve this goal, both real and fictional elements are necessary, as children can use everything they perceive with the senses and still fill out any voids with imaginary elements. Younger children tend to explore actively their environment in preparation for the transition to an imaginary play. Older children, on the other hand, are more skilled at detaching themselves from the real world and feel particularly attracted to games with more complex rules (ibid.).

The process of guided or “scaffolded” play – when the teacher proposes imaginative activities, enriches storylines or adds learning concepts during the children’s play – is a pedagogical technique that has gotten increasingly regarded by the scientific community as a hallmark of high-quality preschool education (Wenner Moyer, 2017). It encourages children to engage with materials, shapes and concepts in more meaningful ways, and has demonstrated to help improve their literacy skills (ibid.). Researchers also argue that play is more important and useful nowadays because kids do not experience the same type of rich exploration activities as in past decades, when they spent more time outside playing with mixed-age groups of neighbour peers. Children living in modern urbanized societies are particularly vulnerable to lack these learning experiences, due to environmental factors that inhibit their natural capacity to play, such as parental over-supervision and stress (Whitebread, Basilio, Kvalja, & Verma, 2012).

2.1.3.3 Phenomenon-based learning

One of the most recent trends across various levels of the Finnish education system is to approach the learning process by covering multiple subjects simultaneously in the form of broader topics. Educators advocating for this phenomenon-based approach (also called topic-based or project-based learning) argue that the human brain can achieve a better understanding of the world by adopting a holistic perspective rather than examining isolated disciplines (Spiller, 2017) and that it helps foster critical thinking, a necessary skill in a world that becomes increasingly more complex and interconnected by technology (ibid.).

In the ECEC Curriculum Guidelines, six core content areas are presented under the name of orientations, a term defined as “(the) different ways of feeling about or reacting to phenomena and things” (National Research and Development Institute for Welfare and Health, 2005, p. 24). These six orientations are:

1. Mathematical orientation
2. Natural sciences orientation
3. Historical-societal orientation
4. Aesthetic orientation
5. Ethical orientation
6. Religious-philosophical orientation

By using the concept of orientation instead of subject, it is highlighted that the intention is not for children to study different subjects, but to acquire new tools and capabilities to increase gradually their ability to examine, understand and experience the phenomena in the world around them (ibid.). This framework aims to provide the child with a multi-sided, integrated and comprehensive image of the world. The chosen themes should be thus linked to the children’s immediate environment, their daily life and concrete experiences so they can participate actively and engage in the discussion from their own points of view (National Research and Development Institute for Welfare and Health, 2005, p. 24).

On the other hand, this approach has also raised criticism, as some educators argue there is a lack of empirical evidence to prove it leads to a better performance during the next levels of education (BBC News, 2017), or that it gives too much creative freedom for teachers to drift away from the traditional education (BBC Mundo, 2015), which could put in a privileged position those smartest students who are able to grasp the complexity of the topic-based projects faster, against those who require more support and guidance from the teachers (Spiller, 2017). For this matter, the National Curriculum Guidelines do not set any performance requirements, as the child is not expected to study the content of the different subjects or orientations (National Research and Development Institute for Welfare and Health, 2005, p. 25). However, it is also highlighted that the orientations act merely as a framework, but ultimately is the responsibility of the educators to “ensure children’s balanced growth and development”, based on their knowledge of the children’s experiences, needs, interests, situations and environment (ibid.) (Eurydice, 2016).

2.1.4 International quality assessment

The definitions of ECEC quality differ across countries, regions and stakeholder groups. These are subject to the beliefs, values or socio-economic context of the country or region, as well as the needs of each community (OECD, 2012). However, various indicators have been established to assess the level of ECEC services among heterogeneous national systems.

One of the organizations that has actively pursued the research and measurement of such indicators is the OECD, through its series of thematic reviews called “Starting Strong”. These periodic reports aim at identifying the successful ECEC policies in various countries around the world, discuss their strengths and opportunities, and provide policy orientations to promote the access to high-quality ECEC (OECD, 2017). So far, five thematic reviews have been published, in 2001, 2006, 2011, 2015 and 2017, respectively. From these, the 2011 edition identified five key “policy levers” (i.e. focus areas for policy makers) which are proved to encourage the quality of ECEC (OECD, 2012):

1. Setting out quality goals and regulations
2. Designing and implementing curriculum and standards
3. Improving qualifications, training and working conditions
4. Engaging families and communities
5. Advancing data collection, research and monitoring

Finland performed above the OECD average in most of the “inputs” for the policies that affect the ECEC workforce quality and outcomes, such as: Above-average public spending levels on child care and education for 3- and 5-year-olds, higher than average direct public spending on ECEC services, longer than average paid paternity leave benefits, higher minimum qualifications for ECEC staff in educating positions, and the favourability of its child-to-staff ratio (OECD, 2012, pp. 9-10, 17-23). Regarding the specific policy outcomes, the country also performed above the OECD average in terms of fertility rates, performance on PISA assessments for reading, mathematics and science, low child poverty, school survival rates and maternal employment rates. Some of the aspects where Finland performed below the OECD average were: The enrolment rates for under 3-year-olds and 3- to 5-year-olds, gender equality in median earnings, below than average cash and tax benefits for families, and a shorter than average paid maternity leave entitlement (ibid.).

Other example of international benchmarking for Finnish ECEC quality indicators is the “Starting well” research programme commissioned by the Lien Foundation in Singapore and elaborated by the Economist Intelligence Unit (EIU) in 2012. It ranked the preschool environment of 45 countries (29 OECD nations and 16 important developed or emerging market economy countries), by assessing 21 indicators across four thematic categories: Social context, availability, affordability and quality. Each one of these categories and indicators were assigned weights based on consultations with internal analysts and external ECEC experts, and measured using official data collected between December 2011 and March 2012. Table 3 provides an overview of the preschool quality categories, indicators and weights used in the index.

Category	Weight	Indicators
Social context	5%	Malnutrition prevalence
		Mortality rate under the age of 5
		Immunisation rate
		Gender Inequality Index
		Adult literacy rate
Availability	25%	Preschool enrolment ratio, pre-primary age (1-year duration) at 5 or 6 years of age
		Pre-school enrolment ratio, official age group
		Early childhood development and promotion strategy
		Legal right to pre-school education
Affordability	25%	Cost of a private preschool programme
		Government pre-primary education spending
		Subsidies for underprivileged families
		Subsidies for preschool providers aimed at including underprivileged children
Quality	45%	Student teacher-ratio
		Average preschool teacher wages
		Curriculum guidelines: Presence, scope and comprehensiveness
		Preschool teacher training (i.e. qualifications) and effectiveness
		Health and safety guidelines: Training, monitoring and enforcement
		Data collection mechanisms, regular reviews and dissemination
		Linkages between preschool and primary school
		Parental involvement and education programmes

*Table 3: The "Starting Well Index" categories and indicators
Adapted from (Economist Intelligence Unit, 2012)*

In the Quality dimension as well as in the overall rank, Finland occupied the first position, followed by Sweden and Norway, due to the “sustained, long-term investments and the prioritisation of early childhood development, which is now deeply embedded in (these societies)” (Economist Intelligence Unit, 2012, p. 6). Furthermore, Finland score highest among all participating countries in the following elements, setting the baseline of what can be considered a top ECEC environment (Economist Intelligence Unit, 2012, pp. 14-15):

- Comprehensive and effective ECEC strategy
- Clear legal right to preschool education
- Effective subsidies that reach underprivileged families
- Student-teacher ratio under 15
- Well-trained teachers in ECEC
- Parental involvement in school
- At least 98% of pre-schoolers enrolled at age 5 or 6
- Well-defined curriculum and health and safety standards
- Healthy and nourished children coming into the system

2.2 Finnish education export

The productization of Finnish ECEC services has not been widely addressed as the core subject of existing academic literature. The exhaustive background review that precedes this thesis revealed no papers or projects devoted exclusively to this level of the national education system. Some of the closest matches were related to the export of Finnish education in general terms, without tackling the peculiarities of ECEC, or giving a higher predominance to the role of higher-education institutions, such as in the case of (Schatz, 2016) and (El Cheikh, 2015). Other research streams have been focused on the potential market entry models and the importance of partnerships in cross-border education services, such as addressed by (Kemppainen, 2016). With the aim of offering new perspectives on top of the existing academic literature, the current section will examine some of the topics covered by the authors mentioned above, in the areas that are most relevant, applicable or adaptable to the context of Finnish ECEC exports. Hopefully, the present research will provide a solid starting point to support the focus on ECEC products and services as a research subject on its own right, with the aim of promoting new business opportunities based on differentiated strategies to attend this market.

2.2.1 Evolution of the education export strategy

The doctoral research by (Schatz, 2016) constitutes a starting point to understand the current state of the art in Finnish education export, as well as the factors that influenced the strategic vision of the Finnish government and other stakeholders to consider offering these services internationally. First, she argues that education export is a concept that may appear at first self-explanatory, such as the transfer of education from one country to another, but is also inherently ambiguous (ibid., p. 46). The reason is education can be considered a human right, whereas the idea of exporting also implies turning it into a commodity that can be sold and purchased in the international markets. Therefore, she uses the following definition to clearly distinguish the business approach to education:

“education export [is] an international business transaction concerning educational practices, services and materials from one country to another” (ibid., p. 52)

As Schatz explains, the popularity of Finnish education rose due to the outstanding PISA results throughout the early 2000s, which placed the country among the best performers in the world (ibid., p. 59). Consequently, Finland became an international “role model” for educators and policy makers, who started to visit the country to gain first-hand insights about the practices behind this PISA success and “take back home” some of the lessons (ibid., p. 65). After realizing there was a high demand for educational “know-how” behind these international pedagogical tourism activities, which could potentially benefit other actors in society, the Finnish government also attempted to capitalize on them by outlining their first official education export policies (ibid., pp. 67-70).

The initial strategy document, published in 2010 under the title *“Finnish education export strategy: summary of the strategic lines and measures”*, defined the education export product only in vague terms as “educational know-how” or “educational solutions” (ibid., p. 94), as these strategies were outlined without a clear service or product ready to be sold (ibid., p. 70) (Ministry of Education and Culture, 2010, p. 3). Among the guidelines outlined in the report were the need of having a well-operating home market as a precondition for export, with relevant actors collaborating in networks and operating in a cluster-like manner, and provisioning themselves with further resources and knowledge for productization. As Schulz argues, the document was not precise on how to proceed with the implementation of these guidelines and transferred the responsibility of product development and financial risk to other actors, giving a predominant role to higher education institutions (Schatz, 2015, p. 332).

In 2013, another working group was established to promote education exports and elaborated a second policy document called *“Finland into the international education markets”* (available only in Finnish, under the original title *“Suomi kansainvälisille koulutusmarkkinoille”*) which expanded further the business and economic aspects of the education export strategy, such as the expected profits and the perceived threats, with

a clear focus in the higher education (Ministry of Education and Culture, 2013). By comparing the two policy documents, Schatz suggests they reflect a change of attitude in the Finnish government and an evolution of the field, considering that the sector did not turn out to be as profitable as initially thought, despite the government investments and the quantity of actors involved (Schatz, 2015, p. 336).

In the end of March 2017, the Ministry of Education and Culture published a further update to their policy for internationalization of higher education and research until 2025, called “*Better together for a better world. Policies on promoting internationality in higher education and research 2017–2025*” (available only under the original title in Finnish “*Yhteistyössä maailman parasta. Korkeakoulutuksen ja tutkimuksen kansainvälisyyden edistämisen linjaukset 2017–2025*”) (Ministry of Education and Culture, 2017), which establishes seven concrete measures or “packages of actions” to promote the country brand as exporter of high-quality education, and gather the interest and efforts of the relevant internal actors (Ministry of Education and Culture, 2017). The action plan also mandates that by 2020, every Finnish HEI should have established clear goals for internationalization, as well as the action plan to achieve them. The measures relevant in the context of ECEC have been underlined in the list below:

1. Launch a program to renew the international interest toward science and leading edge research
2. Develop a positive country brand of Finland as home of high-quality education
3. Entrust the marketing of Finnish education services to a common operator
4. Simplify the processes of seeking education and employment in Finland, with the pledge of providing these official services in English
5. Launch internal consultations and discussions to identify ways to make higher education and research more international
6. Establish a Team Finland Knowledge network to represent Finnish higher education and research in selected countries
7. Invite expat Finns with higher education and alumni of Finnish HEI’s to join the network

Based on these education policy objectives set by the Ministry, an action plan was commissioned to promote the country education export brand. The report “Action Plan Report for Global Education Brand Finland” was submitted in March 2017 and establishes the following seven proposals (Doyle, 2017):

1. Expand the (internal stakeholders’) vision. The benefits of Finland education export and exchange can inspire only if the story is communicated clearly and the offering correctly articulated among educators and policy makers. The Global Education Brand can only succeed if it is structured, packaged, marketed, managed and leveraged to its maximum potential (p. 10)
2. Move the marketing focus from product exporter and position Finland as a global partner, authority, networker host, co-developer, collaborator and leader in all matters related to education, using international rankings, testimonials and expert networks (pp. 12-13)
3. Create an Education Futures Institute for R&D, collaboration, exchange, leadership, innovation and school operations. This institute would have a consulting for-profit arm that advises and assists other national school systems on education planning, architecture, school operations, certification, proprietary systems, among other aspects. Simultaneously, it would also have an R&D non-for-profit arm to collect and curate the best research on a wide variety of educational topics, such as teacher training, early education, school building and playground design, digitalization, childhood social-emotional care and whole child learning, textbooks, future skills, project-based learning, arts and music instruction, communications and critical thinking, play and physical activity for learning and health, etc. Furthermore, partnership options should be explored with similar existing institutes in Singapore, New Zealand, Canada, Netherlands, South Korea, and select U.S. institutions (pp. 14-16)
4. Establish a Global Education Infrastructure Fund with both public and private capital for supporting all phases of the education infrastructure chain, such as school building design, teacher training and

- systems architecture, with both non-profit (development) and for-profit (impact investing) arms (pp. 17-18)
5. Fully marketize Finland's HEIs globally to international students, by developing exchange semester or degree programs, off-shore and virtual campuses, joint programs and other distance and e-learning options (p. 23)
 6. Build a network of Global Lab Schools for the world's children, in partnership with governments, NGOs and civil society, showcasing schools inspired by Finnish and Nordic themes, yet adapted to the local cultures and practices. For instance, a demonstration school could be opened in the capital city of each selected country as joint public-private ventures or social benefit corporations between Finland and the host countries They would operate under specific guidelines and teachers trained under the Finnish curriculum, allowing to pilot new assessments and metrics and evaluate pedagogical methods, products and curricula. These schools would be also tuition-free for everyone but high-income students (pp. 24-25)
 7. Establish a Global Teacher Development Academy to professionally co-develop the world's teachers and principals through continuous year-round programs, such as lectures and workshops on the latest research from Finland, sandbox simulations, conferences, webinars and seminars, coaching, exploration of best practices and the study of the interactions between all the relevant stakeholders. Finland could also host groups of international visitors for development experiences and provide ongoing professional development over the web (p. 27)

In conclusion, from an extensive review of the government policies and recommendations listed above, it can be observed that the prospects for the internationalization and export of Finnish education are at the present date still quite open and continuously evolving. It is worth reiterating that at least during the last five years, the focus has been almost entirely on higher education, pushed most likely by the awareness of the involved parties about the sale of higher education degrees in international markets. Meanwhile, ECEC and primary education have been excluded until the most recent policies, as the marketing strategies to promote the offering of education services abroad get further refined. However, the common factor which has persisted throughout these documents and still gets the spotlight is the call-to-action for a more meaningful collaboration between the stakeholders.

2.2.2 Main characteristics and actors of the education export process

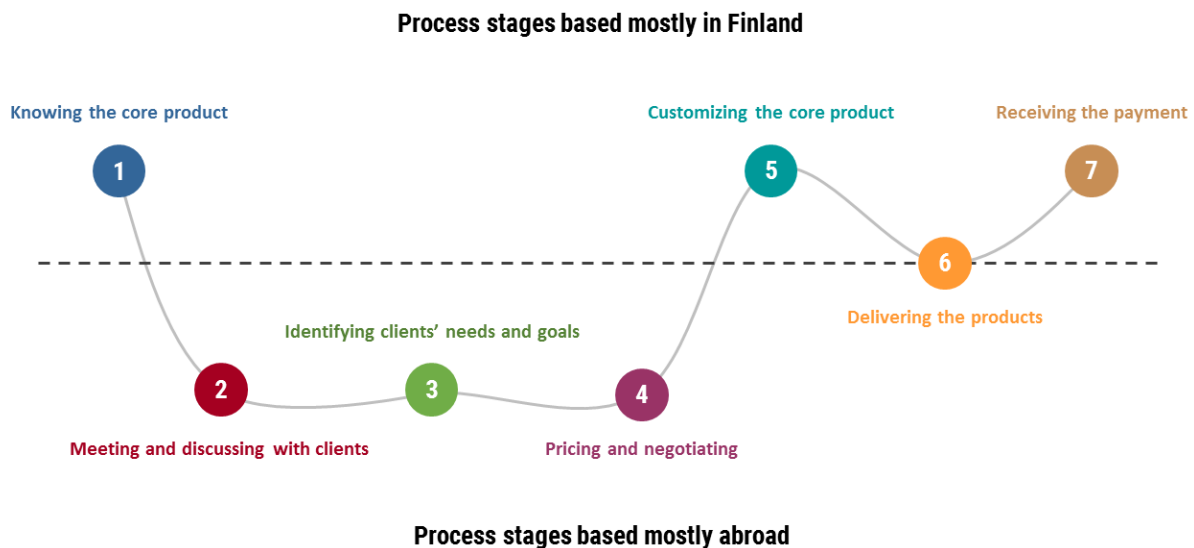
The productization of Finnish education for export was also the main topic addressed by El Cheikh in 2015, as part of a master's thesis research commissioned by Future Learning Finland² to design a sustainable and profitable business strategy for such purposes. The scope of the study was to outline the field of action for higher education institutions (HEI's), but its main findings reflect the entire situation of the Finnish education export market now and then. Twelve participants involved in the export activities, including companies, universities and technical institutes were interviewed, providing information about their key barriers and enablers, which were later categorized into 215 SWOT elements. Based on this process, El Cheikh reached five conclusions which describe the Finnish education export activities in general. These conclusions are listed below, matched or contrasted with the evolution of the export strategy described by Schatz:

1. Every stakeholder has a different definition of "education export": The business potential is still not completely understood by the Finnish society and its relevant actors, who consider education not just

² Future Learning Finland (FLF) was a growth program offering Finnish educational know-how and learning solutions globally (Rautakoura, 2013), which was rebranded in the latter half of 2015 as Education Finland (Education Finland, 2017). It is operated by the Finnish National Agency for Education, and lead and coordinated by Finpro, the public trade and investment organization – supported by the Finnish Ministry of Education and Culture, the Ministry of Employment and Economy, and the Ministry for Foreign Affairs – which helps local SMEs to go international ("Export Finland"), encourages foreign direct investment ("Invest in Finland") and promotes travel to the country ("Visit Finland") (Finpro, 2017). All these initiatives belong to a greater network of publicly funded organizations, government authorities and education institutions called Team Finland (Team Finland, 2017).

as a for-profit activity, but also about changing the world and supporting the wellbeing and sustainability of societies through collaborative learning (El Cheikh, 2015, p. 49). As (Schatz, 2016) points out, this “Finnish way” of perceiving education also represents a paradox: The success and differentiating factor of the national education system lies in its core social values, opposed to the neo-liberalist vision of commodification and marketization of the education services. On the other hand, education export tries to capitalize on these same values by turning the system into a lucrative business (Schatz, 2016, pp. 143-145). Because of the conflicting visions and lack of a clearly defined export product (Schatz, 2016, pp. 141-142), the term “education export” falls into a wide and heterogeneous set of categories such as R&D, international cooperation or sustainable development projects, which involves different activities like training, consulting, school visits and know-how transference deals (El Cheikh, 2015, p. 49) that could be vaguely described as “educational solutions” (Schatz, 2016, p. 94), or “educational expertise” (Schatz, 2016, p. 143). While this procures more flexibility, it also makes the Finnish education landscape difficult to trace and analyse, as any participating entity is encouraged to become education exporter with an individually defined product or service that falls under the same label (Schatz, 2015, p. 332).

2. Finnish education is an excellent product, but the process of selling it is still complex and requires extensive human and financial resources, throughout the seven stages illustrated in Figure 4
3. Business networks and personal contacts play an important role, particularly in the establishment of meaningful partnerships and the selection of the right markets
4. Entities involved in Finnish education export activities adopt both negative and positive attitudes, such as lack of trust and shared vision with other involved actors, risk aversion, and competitiveness over cooperation in the first category (El Cheikh, 2015, pp. 48, 65); or humbleness, innovativeness, flexibility and motivation to succeed in the second one (El Cheikh, 2015, p. 64). As described by (Schatz, 2016), the difficulty of Finnish society to perceive education as a private product or service for export should be considered an important driver of negative attitudes
5. Customers are the most important element when productizing and internationalizing education, so Finnish exporters should focus on building and delivering products that meet customers’ needs and expectations. The domestic experience of education as a public service or good provides insufficient feedback to fully comprehend these customer needs and expectations. Thus, the awareness of the local providers from a business standpoint is also limited



*Figure 4: The selling process of education export
Adapted from (El Cheikh, 2015, p. 52)*

El Cheikh also highlights that the necessary skills, resources and capabilities to productize and internationalize Finnish education are scattered throughout different entities, such as illustrated in Table 4. Therefore, the country as a whole has the potential to perform education export activities, but organizations that engage in the process alone by themselves will struggle, if not fail (El Cheikh, 2015, p. 70).

Entity	Key assets
Universities	Reputation (ranking, accreditation) Faculty / Students Academic research Teaching expertise Government funding
Polytechnics	Networking (alike and interconnected) Specialized degrees Practical learning approach Government funding
Vocational institutions	Life-long learning programmes (youth and adult education) Multi-field coverage Link with municipalities, foundations, etc.
Companies	Marketing & sales <ul style="list-style-type: none"> - Selection and vetting of target markets and partners - Administrative and operational capabilities - Commercial, legal and financial expertise - Understanding of the customer - Networking (private sector) Digital & software components <ul style="list-style-type: none"> - Scalability and profitability - Technical and human resources for development and deployment - Flexible and agile development, iterative improvements
Government / Ministries / Education Finland / Team Finland	Public servants, paperwork, official procedures Pro-education promotional events and support activities Networking (public and private sector) Funding
Students' organizations and/or representatives	Active values and vision New ideas and solutions

*Table 4: Education export stakeholders in Finland and their key assets
Adapted from (El Cheikh, 2015, p. 47)*

2.2.3 Modelling of education export services

Kemppainen describes various market entry models and the importance of partnerships for cross-border education, with focus on Finnish HEIs (Kemppainen, 2016). Many theoretical concepts from the background research and the case study of her Master's thesis provide a basis to understand how education in general can be modelled as a service, among other important considerations for the education export companies. First, she proposes to divide the delivery of education services as a twofold transaction³:

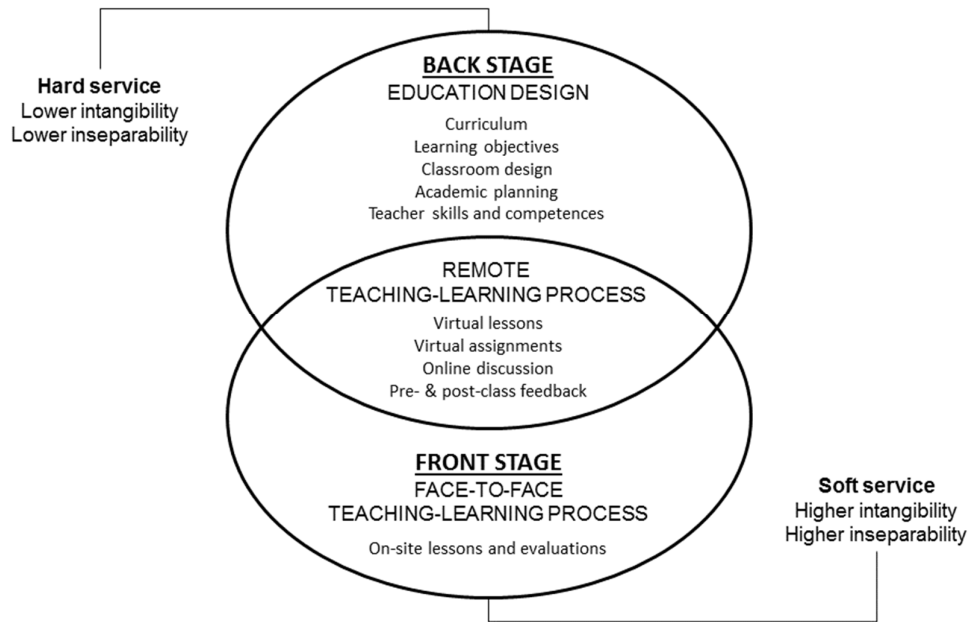
- **The front-end** or teaching-learning process, which consists in the classes and other educational activities that require the physical presence of the students, and
- **The back-end**, composed by a wide variety of education design operations, such as the planning of teaching activities, the curriculum design, setting up the learning environment, training, grading, etc.

³ The concepts of front-end and back-end are also part of the services theory explained in Section 2.3.6.1, differentiating what is visible to customers or not, respectively. In Kemppainen's model, the students take the role of the customers.

The description of these layers is complemented by Erramilli's model of soft and hard services, which takes two attributes from the IHIP model – inseparability and intangibility – to make a clear distinction between service delivery modes. Soft services require simultaneous production and consumption, as these two cannot be separated. Furthermore, in most cases they must be tailored to the needs of each customer. Consequently, soft services also have a higher dependency on the individual producer. On the other hand, hard services allow to decouple their production and consumption, either due to the very nature of the service provided, or because technological developments break the distance barrier between the parties involved. This allows to generate physical artefacts that increase the tangibility of the service and expose its existing methods in the form of standardized and transferable evidence, such as in the case of electronic banking (Erramilli, 1990).

Based on these two definitions, Kempainen argues that the back-end is also the hard services layer, as most of the educational design can be produced remotely in advance. For instance, the contents of the curriculum, the learning objectives, the grading criteria and the physical arrangements for the classes can be all defined up to the smallest detail beforehand, to be delivered then to each external location in the form of documents, manuals and blueprints. The front-end, however, can be perceived as the soft services layer, since the teaching-learning process is highly dependent on the individual skills, knowledge and capabilities of the teacher, as well as on the interactions between the teacher and the students (Kempainen, 2016, p. 30).

A key difference between the original definitions of soft and hard services outlined by Erramilli and the delivery framework of education services proposed by Kempainen is that the first one argued that soft services *cannot* be exported because the producer and receiver should be in close proximity (Erramilli, 1990, p. 57). However, both perspectives could be considered inaccurate, depending on the channels by which the teaching-learning process is conducted and whether its pre- and post- service stages are considered also inside the scope of the word “export”. If the teachers must be physically present on site (i.e. face-to-face lessons) then Erramilli's definition is correct, as the service can be advertised and its terms can be negotiated, but the process cannot be exported directly. In that case, what is exported is simply *the promise* of the service (e.g. service-level agreement) rather than the service itself. However, if the teaching-learning process is executed through e-learning platforms, mobile applications, or other types of technologies, then the service itself can be indeed delivered as an export. Furthermore, the teaching-learning process has a longer lifetime that covers other activities besides just the lessons themselves, like pre- and post-assignments, feedback and other types of teacher-student interactions. In those cases, the teaching-learning process would overlap between the definitions of soft and hard service, depending on the way it is delivered (i.e. face-to-face, remotely or both). These considerations have been deemed an important reason to adapt Kempainen's framework. The updated version is represented graphically by Figure 5.



*Figure 5: Education as a service
Adapted from (Kemppainen, 2016)*

Based on this categorization, the intangible components that are handled through the education services can be vaguely categorized as cultural, human or knowledge assets. The outcome of the service, on the other hand, also constitutes knowledge itself, as the recipient gains a deeper understanding of bigger entities, smaller details, stimulated minds, new technologies, techniques and tools, innovation skills, experiences, and so forth (Kemppainen, 2016, p. 28).

The efforts to pursue the internationalization of education are affected by both *push* and *pull* effects. In the home country, the need to improve the organizational reputation and increase revenues due to limited domestic markets are the two key factors pushing the offerings abroad. Meanwhile, in the host market the main reasons to import foreign solutions are the growing demand for higher quality services, increased visibility among competitors and the potential cost efficiencies achieved by an easier scalability (Kemppainen, 2016, pp. 16-17, 54).

Another point to highlight from the research is the determining role of the so-called “human factor” in the selection of local partners for the cross-border education services, which can be reflected in every interview and most of the documentation (Kemppainen, 2016, p. 77). Kemppainen argues that the selection of adequate partners is mostly subjective and thus highly unpredictable throughout all stages of the partnership formation. Furthermore, real-life experiences, proofs-of-concept, credibility and personal connections allow to achieve a greater appeal than distance marketing during negotiations (Kemppainen, 2016, pp. 67-69).

2.3 Service design: History, scope and key concepts

“Service Design” (SD) emerged in the shift between the 20th and 21st century, intertwined along several other concepts, such as “Interaction Design” (IxD), “(User) Experience Design” (UX) and “Transformation Design” (Kimbell, The turn to service design, 2009). These new fields in the already busy category of design aimed to reflect two recent developments: First, how the latest Information and Communications Technologies (ICT) had changed the traditional outputs of design, providing electronic products arranged on distributed interfaces and devices. Second, how design had evolved in the management theory and practice, as way of organizing production and consumption, and playing an increasingly significant role in the creation of new or innovative products and services (ibid.).

Even though the roots of SD can be traced back in time, there is still no clear consensus among practitioners and researchers about its actual meaning. This difficulty arises mostly from the continuous inflow of empirical evidences. The design practice changes constantly, leaving little room for considerations on definitions (Toskovic, 2016). In other words, attempting to provide an exact and comprehensive definition of SD is considered by most of its practitioners a challenging task, since it is a relatively young discipline which feeds from several fields of action and keeps constantly evolving.

From the point of view of (Stickdorn & Schneider, 2016), SD should not be simplified into a single common definition, because that might constrain it to some specific use-case scenarios. They argue that SD is an evolving approach and as such, a working definition may be found in any combination of examples and points of view from agencies and academics. For this reason, this thesis does not aim to provide a definitive explanation of what is SD, as that would require not only the consideration of a wide variety of current applications of the discipline, but also adjusting it to any future changes that could arise in its methods and tools due to technological developments, the evolution of other related design practices, or the inflow of contributions from researchers and practitioners. This chapter will nevertheless aim to find a suitable theoretical approach to SD that can be used specifically to outline the reasoning and methods employed in the context of this thesis project, by examining the notions behind services and goods, the history of SD as an emerging discipline related to other fields of design, some of its essential characteristics and how it can be used to address the case described in later sections.

2.3.1 S+D = SD? A holistic approach to the field

A previous approach that has been utilized to elaborate a working definition of SD is to split the concept into the two words that constitute it, which means, to define first *what* is a service and later analyse *how* a service that falls into the previous characterisation can be designed, such as done by (Segelström, 2013) and (Grekula, 2016). This approach has the convenience of matching the way how the “S” in “Service Design” has been historically understood, and how it evolved hand in hand with the advancements in technology, as they started to challenge the traditional formal notions of what can be considered a “service”. Furthermore, opening the discussion of how these services can be designed (the “D” in “Service Design”) also allows to examine the relation of SD with similar approaches in the specific context of IT systems, such as HCI, UCD, UI and UX design, which continuously shape and influence the way SD is applied nowadays. This comparison with related disciplines becomes fundamental to understand SD as a holistic approach which cannot be defined by just its own component words, as the combination of both “service” and “design” transcends its own individual meanings and opens the door for new application fields.

Holism is a scholarly word originated from the Greek *‘holos’* (whole) and embodies the idea of how the properties of a system cannot be determined or explained by the sum of its components alone (Härkönen & Jämsä, 2005). The philosophical roots of holism may date back as early as the times of Heraclitus (c. 535-475 B.C.) and Socrates (c. 469-399 B.C.) (Mirza Iqbal, 2012), but the term was thoroughly elaborated in its current definition by Jan Smuts (1870-1950), former Prime Minister of South Africa and Commonwealth military leader, in his book “Holism and Evolution” (1926), in which he stated that holism is *“a unity of parts which so close and intense as to be more than the sum of its parts”* and *“a process of creative synthesis, (in which) the resulting wholes are not static but dynamic, evolutionary, creative”* (Smuts, 1926, pp. 85-86).

The concept of holism also acted as the cornerstone for the movement of German Gestalt psychology during the second decade of the twentieth century, and which is often referenced in the fields of HCI and IxD as a set of guidelines to design good user interfaces (Soegaard, n.d.). Gestalt is a word which literally means “form” in German, but it was used in a wider context to describe the principles that determine how people react to visual patterns or ordered arrangements. This school of thought concluded that the basic unit of human perception is not an isolated, independent sensation, but rather a configuration different from the sum of experiences associated with each individual stimulus taken separately (Lewis).

Holism makes a further appearance in the General System Theory (GST) outlined by Ludwig Von Bertalanffy (1968). Although he originally aimed to address the mechanistic approach in the field of biology prevalent at that time, which explained living “organisms” by reducing them to the laws of mechanics – or physics – and chemistry (i.e. non-living systems), most of the principles outlined in his GST can be also applied in the present to SD as a holistic discipline. Bertalanffy established the notion of “open systems” as a model that could be applicable to any field of science (Drack) (Kompa, 2012). Among the principles of his GST, Bertalanffy described a system as an assembly of components that fit together in an organized way and for a particular purpose, with different components making up different systems dependent on that purpose. Furthermore, these components are arranged in such a manner that if one of them was removed or altered, the behaviour and functioning of the entire system as a whole would be changed as well (Sims).

Considering the various definitions of holism listed above, the reductionist approach of defining SD by examining each one of its component words may not reflect the current “whole picture” of its holistic, open-system nature. However, throughout this thesis and other related research, standalone references to the concepts “service” (singular), “services” (plural) or “design” may be found, as well as in various other combinations such as “designing for services”. SD practitioners should understand, differentiate and use properly these terms, to develop what (Stickdorn & Schneider, 2016) call “a common language and terminology” which communicate effectively the intrinsic value of the discipline to customers and people unfamiliar with it. In other words, to grasp a better comprehension of what Service Design does, it necessary to understand what is (or has been historically) considered a service, how a service can be designed, and what other design fields relates to, covers partially or fully, and expands upon or complements.

2.3.2 The evolution of service theory

The second half of the 20th century was characterized by the rise of service industries in what was described as the “the service economy” or “post-industrial society” (Miles, Kastrinos, & Flanagan, 1995). The word “service” can be defined in many ways (ibid.), as it is the generic category commonly used to describe a wide range of economic activities present in society, such as banking, healthcare, education or transportation. The common factor among all these cases is *the application of competences (knowledge and skills) by one entity for the benefit of another*, which is the way how (Vargo, Maglio, & Archpru Akaka, 2008) define services⁴.

Services are highly diverse in terms of where they happen, their level of organizational complexity, the amount of experience required to design and deliver them, the involvement of people or technologies, and the extent to which they can be personalized (Kimbell, 2009). Yet they are also omnipresent and increasingly important for the modern economy: To put things in perspective, a report published by the Business Innovation Observatory of the European Commission in 2014 indicated that over two thirds of the people employed in Europe were working in the service sector. Furthermore, between 60% and 70% of the annual gross value figure achieved by the majority of European states could be attributed to services (Dervojeđa, Verzijl, Nagtegaal, Mark Lengton & Elco Rouwmaat, & Erica Monfardini & Laurent Frideres, 2014).

Services have been conceived typically as the counterpart of products (Kimbell, 2009). Academics and marketers have struggled with the distinction between goods and services since the 1970s, when the substantial

⁴ This is a broad definition that is used to introduce the theoretical fundamentals of services as an academic research subject approached from the marketing and management perspectives in the last decades of the XX century. A more specific definition is provided in Section 2.3.6 in the context of SD, which incorporates the language and rationale by which SD professionals carry on their design process. Although they both refer essentially to the same word, the first definition has a broader scope of application beyond SD and therefore, the latter is the one preferred for use in the following chapters of this thesis.

economic value of services started exceeding that of other sectors (Kimbell, 2016). Since then, the IHIP framework presented by (Zeithaml, Parasuraman, & Berry, 1985) has become one of the most predominant efforts to characterize the distinctive nature of services into a formal model (Grekula, 2016) as it attempted to condensate the four essential characteristics that were used as the main differentiators between services and goods. The name IHIP is an acronym that stands for each one of these attributes:

- **Intangibility:** Services do not have a physical form (Segelström, Stakeholder Engagement for Service Design, 2013), are immaterial and cannot be perceived (Grekula, 2016) in the same manner as goods can be experienced by the senses
- **Heterogeneity:** The outcome of the service cannot be standardized, as goods in a production line (Segelström, Stakeholder Engagement for Service Design, 2013) because the result is different every time they are delivered (Grekula, 2016). The variation is caused by both the provider and the consumer of the service.
- **Inseparability:** The production and consumption of services cannot be separated from each other, highlighting the crucial role of the customers (without them, the service cannot be delivered) (Segelström, Stakeholder Engagement for Service Design, 2013).
- **Perishability:** A service cannot be pre-produced and stored for later use, highlighting the importance of resourcing (Segelström, Stakeholder Engagement for Service Design, 2013)

During the next two decades after the IHIP model was published, it was subject to the critical scrutiny of academics and scholars, who found the characteristics to be both non-extensive and non-exclusive (Grekula, 2016): They could not be generalized to all services and they were also present in some goods (Lovelock & Gummesson, 2004). A series of papers published by Vargo and Lusch addressed this problematic, by proposing a new perspective for marketing, which according to their rationale “has shifted much of its dominant logic away from the exchange of tangible goods (manufactured things) and towards the exchange of specialized skills and knowledge, and processes (doing things for and with)” (Vargo & Lusch, 2004). Instead of finding new ways of describing services as a sub-discipline of marketing (i.e. “services marketing”), they proposed to build a more comprehensive and inclusive dominant logic, which integrated both goods and services, with the latter taking the centre-stage (Segelström, Stakeholder Engagement for Service Design, 2013) (Vargo & Lusch, 2004). They argued that goods and services are not two mutually exclusive categories (e.g. tangible versus intangible), but part of the same economic exchange that has *service* (in singular) as its basis. Sometimes this service is delivered directly and sometimes it is delivered indirectly, through the provision of tangible goods that simply act as their *distribution mechanism* (Vargo & Lusch, 2004). This view became known as Service-Dominant logic (S-D logic), as opposed to the traditional Goods-Dominant logic (G-D logic). Figure 6 illustrates the difference between these two perspectives.

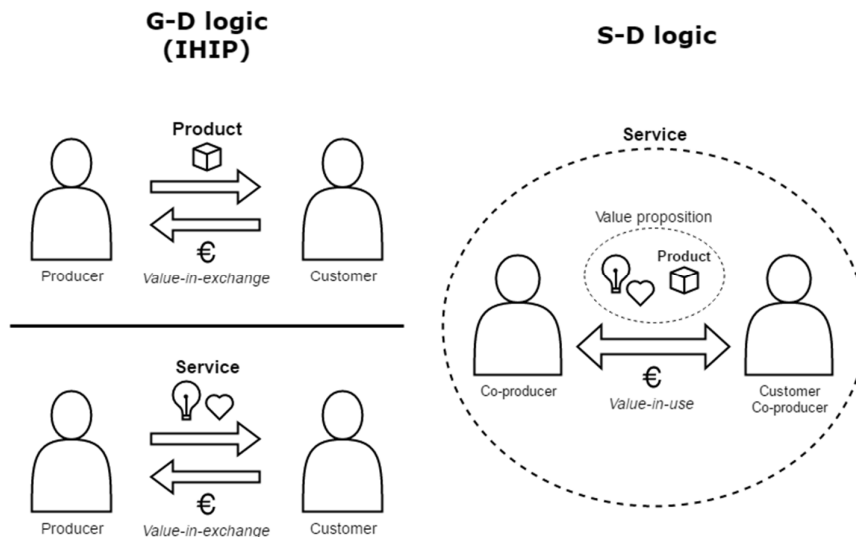


Figure 6: Comparison between the G-D logic and S-D logic

The S-D logic was initially based upon 8 foundational principles (Vargo & Lusch, 2004), which were later adjusted and expanded to 10 (Vargo & Lusch, 2008). These principles are explained in Table 5.

FP1	Service (in singular) is the fundamental basis of exchange, as people acquire the benefits of specialized competences (knowledge and skills), regardless of whether the output of those activities takes the form of tangible goods or services
FP2	Indirect exchange (i.e. through goods) masks the fundamental basis of exchange
FP3	Goods are just a distribution mechanism for service provision, because they hold inherent value derived through their use ("value-in-use" rather than "value-in-exchange"): Humans transform matter into a state that satisfies their desires
FP4	Operant resources (i.e. dynamic resources that produce effects on other resources, such as knowledge, skills, core competences or organizational processes (Madhavaram & Hunt, 2008)) are the fundamental source of competitive advantage
FP5	All economies are service economies, as the word service (in singular) describes the process by which the resources of one entity are used for the benefit of another
FP6	The customer is always a co-creator of value, since the value occurs as result from the interactions between the customer and the service delivery system
FP7	The enterprise cannot deliver value, but only set up the environment to offer their applied resources as value propositions
FP8	A service-centred view is inherently customer-oriented and relational, because is the customer who accepts the value proposition and determines its benefit
FP9	All social and economic actors are resource integrators, leading to networks of exchanges
FP10	Value is always uniquely and phenomenologically determined by the beneficiary, through the combination of own experiences, context and meanings

*Table 5: The updated foundational principles of S-D logic
Adapted from (Segelström, 2013) and (Vargo & Lusch, 2008)*

As (Blomkvist, Segelström, & Holmlid, 2011) argue, the S-D logic has a broader scope for services management, while SD is just the part of it that focuses on developing new services and improving existing ones. Therefore, among all the foundational principles of the S-D logic, they highlight four of them which are the most relevant in the context of SD: FP3, FP6, FP7 and FP8. Their importance derives from the way they explain the user-centric nature of services and describe value as a co-creation process between the customer and the service provider, who simply sets its available resources (e.g. employees, competences, specialized skills or goods) in a particular configuration environment and proposes it to the customer (i.e. value proposition), so the customer can determine the actual benefit from the interactions with it (Segelström, 2013).

An important clarification as (Grekula, 2016) notes, is that the term co-creation carries different meanings in the scope of S-D logic and the language of SD practitioners. In the first case, it is referred to the co-creation of value in a service system between provider and customer, whereas in the latter it is used to describe broadly the set of collaborative activities that involve designers, users and other stakeholders in the generation of ideas and concepts for new services or for improving the existing ones, a process which is called co-design in S-D logic. It is therefore possible to establish a hierarchy of "co-" terms in the S-D logic and locate SD as an equivalent way to refer to the co-design of the service structure along with the stakeholders, which is just a part of the co-production of the service system. This co-production of the system establishes in turn the base conditions so the customer and provider can jointly co-create the value of the service as it is delivered and used (Segelström, 2012).

Furthermore, the S-D logic was not the only current of academic research in services derived after IHIP, nor was it free from questioning. (Grönroos, 2008) separated the concept of service into three aspects as they were addressed in academic literature: (1) service as an activity, (2) service as a perspective on the customer's value creation and (3) service as a perspective on the activities (i.e. business logic) of the provider. He concluded that the foundational principles of the S-D logic give a secondary role to the customers as facilitators in the co-creation of value, when it is the other way around: The providers are the helpers, by providing value-facilitating goods and services as input resources to the customer's own self-service process of generating the desired value in their lives. He also emphasized that the adoption of S-D logic is a strategic decision, which creates further opportunities for the provider to develop new interactions that can actively influence how the customers create value from the value proposition. Therefore, companies that adopt an S-D logic are not only restricted to deliver value propositions as stated in FP7, but also have the opportunity to influence the value fulfillment process by engaging directly with the customer (ibid.)⁵.

The emergence of the Internet as an important business tool during the late 1990s and the resulting explosion of interest in e-commerce challenged even further the existing service concepts. New business models surged as the delivery of information-based services and the relation with customers changed in radical new ways, in some cases without interacting with a human provider, as explained by (Lovelock & Gummesson, 2004). The traditional division between goods and services was thus considered to be outdated, and required a shift in focus from the means and the producer into the utilization and the customer. In response to this changing scenario, they proposed a different perspective around the notion that "*marketing transactions that do not involve a transfer of ownership are distinctly different from those that do*" (ibid.), which they called the "rental/access paradigm". It characterizes services as an opportunity to share resources, either manufactured goods, labor or expertise, during a limited time. Ownership is temporary, until the resource ceases to exist or the owner decides to dispose of it.

This perspective has expanded along with the development of cloud computing technologies and can be used as a lens to understand the underlying business model of companies operating with "as-a-service" acronyms, such as "Software as a Service" (SaaS) or "Mobility as a Service" (MaaS) (Grekula, 2016), as illustrated by current companies that provide over the Internet digital services once considered physical products available only in brick-and-mortar stores, such as Netflix (movies and series) or Spotify (music). An additional level of flexibility in the dynamics between providers and consumers is present in other modern companies like Kickstarter (crowdfunding), Airbnb (accommodation) or Uber (transportation), which have gone one step further and built a platform for the participants to interact or transact between each other with a high level of autonomy. Several labels have been used interchangeably and sometimes inconsistently as synonyms to describe this model, such as: "network orchestration" (Libert, Wind, & Beck, 2014)", "sharing economy", "collaborative consumption", "access-based consumption", "collaborative economy" and "circular economy" (Codagnone & Martes, 2016). The implications of this model in different aspects of society, such as policy making, have been strongly debated (Penn & Wihbey, 2016) and may provide additional opportunities for discussion, a topic which falls out of the scope of the present research.

2.3.3 Integrating design into service

One of the most relevant theoretical efforts to bridge the gaps between the conflicting points of view about services, originating from the background of marketing and operations management fields, and the role of the relatively young discipline of SD was done by (Kimbell, 2011). She pointed out that according to the existing literature either (a) everything is a service, based on Vargo and Lusch's S-D logic, or (b) new ways must be found to understand the specific properties of the organization and consumption of services, for instance by emphasizing the ownership and access to resources, such as described in Lovelock and Gummesson's "rental/access paradigm". She proposed then a framework modelled as a matrix, with the two conflicting aspects she attempted to conciliate on each axis:

⁵ Personalization and recommendation engines like the ones used by Netflix and Spotify are some examples of how the providers can influence continuously the value fulfilment of their customers: The value proposition remains the same (e.g. delivery of movies or songs to entertain) but they facilitate and make the consumption more pleasant by tailoring the selection of contents to the customer's own individual preferences.

- **The role of design:** Either as a *problem-solving* activity to comprehend what has already been conceived, or as an exploratory *inquiry* to build understanding about the designed artefact and create meaning together with stakeholders; and
- **The role of service:** Either the distinction between goods and services *matters* significantly and is therefore maintained as a separate category (i.e. the IHIP perspective), or service is better understood as a base activity with various actors *within* the entire value-generation process (i.e. the S-D logic).

Together, the combination of these quadrants outline the four distinct ways of understanding SD, as illustrated in Figure 7.

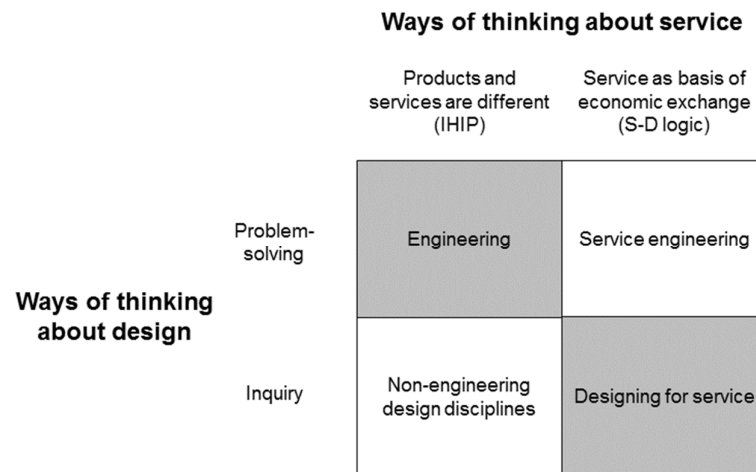


Figure 7: The four ways to conceptualize SD
Adapted from (Kimbell, 2011)

Based on this framework, Kimbell performed an ethnographic research of three firms of professional service designers to find out what these designers understand themselves to be designing and how they do it. Based on the results, she concluded that the activities performed by the professional service designers fall into the bottom right quadrant of the matrix, in other words “designing for service”: They adopted a constructivist approach to design, combined with the view that the distinction between goods and services was not relevant for their work:

“In their research and proposals to redesign aspects of the enterprises’ services, the designers focused on how the various actors involved in the service were configured to create value. By referring to this as designing for service, makes clear that the purpose of the designers’ enquiry is to create and develop proposals for new kinds of value relation within a socio-material world.” (Kimbell, 2011, p. 49)

This analysis helps to understand how design practices have been integrated into service theories, converging into a vision that aligns mostly with the S-D logic of service being the basis of economic exchange. Even if SD has been acknowledged as the disciplinary term, “designing for services” was an important push to move designers away from the IHIP understanding of services into a vision more aligned with the S-D logic (Segelström, Stakeholder Engagement for Service Design, 2013). By using the word “*for*”, Kimbell also emphasized that what is being designed under the concept of SD (i.e. the services) is not the end result, but a platform for action that sets the prerequisites for the diverse actors involved in the service delivery to engage over time (ibid., pp. 25) (Kimbell, 2011, p. 45).

2.3.4 Service design in a multidisciplinary context

Designers started to talk about “Service Design” (SD) in the early 1990s, relying on the early work about services marketing. The basis of the discussion by that time was clearly influenced by the IHIP framework, portraying services as something different than products (Segelström, 2013). As practitioners who were trained in other areas moved gradually into SD projects, much of the early scholarly research was focused on

connecting SD with other existing design fields and advocating for it as a standalone discipline on its own right (Blomkvist, Holmlid, & Segelström, 2016). The focus gradually changed from justifying the existence of SD into further examining and describing its characteristics. By 2008 and 2009 there were already two main trends of research, as identified on a review of SD literature by Blomkvist, Holmlid and Segelström (ibid.):

1. Widening the scope of SD, by integrating practices and ideas from non-design fields, such as marketing and engineering, and
2. Challenging and exploring the (traditional) basic assumptions in SD, as well as the (application of) methods inherited from other disciplines.

Furthermore, they also identified five distinct perspectives from which the SD research had been conducted so far (adapted from (Segelström, 2013)):

- **Design theory:** Exploring the fundamentals of the SD discipline such as co-creation, the language and practical terminology, and the relation with other design fields like HCI and participatory design
- **Management:** Using a service marketing and management thinking to understand SD
- **Systemic approach:** Analysing product-service systems from an engineering perspective (i.e. components, interfaces, systems, sub-systems)
- **Design-techniques:** Describing the specific tools and processes used in SD projects
- **Case studies:** Exploring projects executed with (or labelled as having) an SD focus

By approaching SD from design theory, scholars aimed to describe its origins based on other related fields. One of such frameworks that allows to understand the incremental evolution of the design disciplines was proposed by (Buchanan, 2001). He used the target object of the design process as a core element to establish the “four orders of design”. Each order represents the level of comprehension about the designed object – symbols, things, actions and thoughts, respectively – that humans have grasped and for which a concrete design discipline has been thus established. Each successive level incorporates and builds upon the knowledge of the previous ones, to create a new design field of greater complexity.

This can be also described as a manifestation of holism and the nature of open-systems, as new levels of abstraction can be reached when human needs and the knowledge of the world (which in most cases go together) evolve and become increasingly more comprehensive. Every design discipline contains all the theory, tools and applications of the previous ones, but at the same time constitutes a whole new discipline by itself.

This model is represented in Figure 8, where each successive square can be understood as being part of all the larger ones that contain it. Based on Buchanan’s framework, SD takes its own position in a multidisciplinary context as a standalone discipline – located in the outer boundary of the Interaction Design (IxD) order (Segelström, 2013, p. 14) – but at the same time collects all the knowledge from the other fields of design.

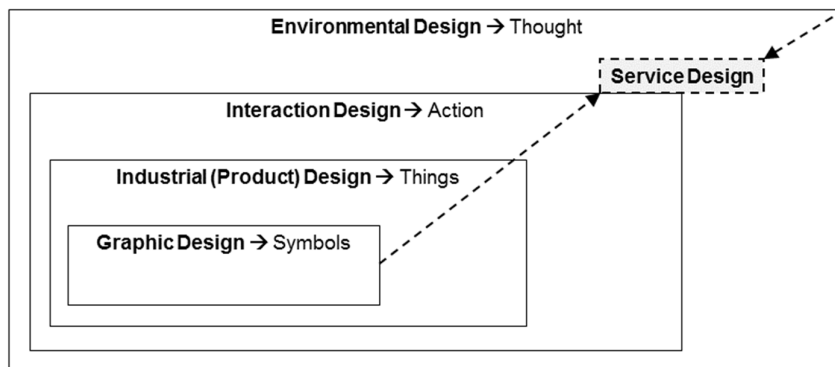


Figure 8: SD located within the four orders of design and their objects of concern
Adapted from (Segelström, 2013) and (Buchanan, 2001)

The perspective of SD located in an order of abstraction above IxD is corroborated by (Holmlid, 2007), who used Buchanan’s framework as a partial model to establish the commonalities and differences between these two disciplines. He argued that the service perspective was bringing challenges into the IxD practice, while technology usage (i.e. the “Interaction Design” order of Buchanan’s model applied to digital artefacts) was challenging the scope of SD. He concluded that both IxD and SD could act as boundary openers or integrating disciplines across all four orders of Buchanan’s model: The first one integrates to some extent in the digital material the symbols, things and actions, whereas the latter brings together the actions and the thought governing the environment where these actions take place, as illustrated in Figure 8. A complete summary of the results of the comparison between IxD and SD is provided in Table 6.

Interaction Design (IxD)	Service Design (SD)
Practitioners see themselves as working from the “outside-in”, rather than from the “inside-out” of the company	
Have a social dimension to address	
The designed object has dynamicity and temporality attributes	
Employ various design methods	
Highly analytical but not significantly explorative	Highly explorative and somewhat analytical
Representations are not significantly depictive (lack capacity to illustrate a specific perspective), highly symbolic (cover most or all the potential scenarios) and somewhat enactive (difficult to recreate)	Representations are somewhat depictive (show only a specific perspective), highly symbolic (other scenarios can be inferred from it) and enactive (can be recreated)
Immateriality of the designed artefact and ongoing production process (e.g. end-user created content)	Often composed of ready-made and more “tangible” artefacts (e.g. service interface, blueprints, manuscripts)
Limited dynamicity in the deliverable (e.g. limited number of ways to perform an action)	The deliverable is somewhat final (the design of the artefact is finalized before it is produced) but highly dynamic (i.e. multiple possibilities of action paired with human judgement)
Appropriate when the company perceives its main role as delivering products or artefacts, otherwise the process, material and deliverables must be adapted	Fits easily when the company views itself as a service provider
The customer (i.e. the firm) is more important than the customer’s customer	The customer’s customer is equally important as the customer
Can provide its specialist competence to SD	Cannot operate on its own, depends on specialist competence from disciplines like IxD or Product Design
Focus on the design of the interactive artefact	Focus on the design of the service that the interactive artefact is part of

*Table 6: Similarities and differences between IxD and SD
Based on (Holmlid, 2007)*

Besides the disciplines described above, the introduction of ICT products to consumer markets from the 1970s onward led to the appearance of other encompassing terms to describe the design of User Interfaces (UI) from the user’s own perspective. Computer Supported Cooperative (or Collaborative) Work (CSCW), Participatory Design (PD, also known as Cooperative Design) and Human-Computer Interaction (HCI)⁶ are examples of such terms, which are all covered under the umbrella term of User-Centred Design (UCD) (Segelström, 2013, pp. 11-12). Besides the latter, another umbrella term commonly used is Human-Centred Design (HCD) and although UCD and HCD are often used interchangeably, some authors prefer to highlight the inclusiveness

⁶ As explained by (Grekula, 2016) and (Segelström, 2013), HCI is just another term that has appeared over time to describe the design of technological user interfaces. Among other equivalent ways of describing this same discipline are user interface (UI) design, usability design, user experience (UX) design and interaction design (IxD), which positions all of them in the same order of design addressing the “action” object from Buchanan’s model, and at a lower level of abstraction than SD.

and ethics that the word “Human” adds to the design process, which after all has the ultimate objective of improving people’s lives (Grekula, 2016).

Based on the analysis above, SD can be understood as a more comprehensive discipline with a broader scope, which in some cases deals with the design of technology user interfaces and in some other cases does not. It brings together all the fields from the IxD/action order of Buchanan’s framework (i.e. CSCW, PD, HCI, UX, UCD, HCD, etc.), connecting them to other areas which fall outside the scope of design and reflect more upon the order of environment/thought, such as management, marketing and research. In this sense, SD acts more as a platform that allows to bring together the customer’s perspective and the organizational perspective, mediating between the two of them (Toskovic, 2016) (Moritz, 2005). Figure 9 provides an example of how SD can link these various fields of expertise. It does not provide an exhaustive collection of the related disciplines, which may be arranged into different configurations depending on each project, but acts as an illustrative explanation of the different angles to approach the multi-disciplinary context of the SD process.

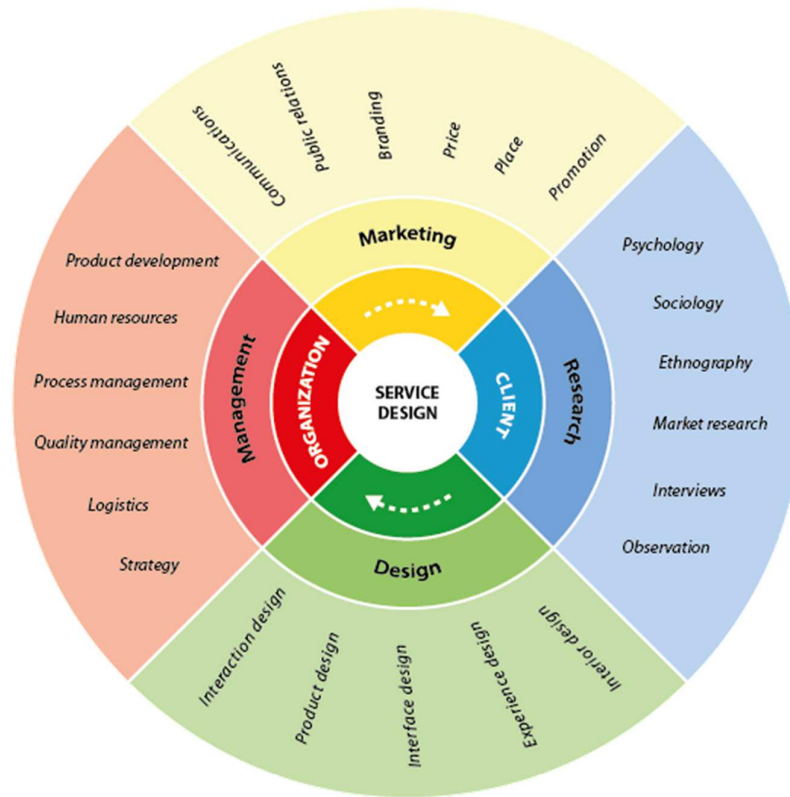


Figure 9: Areas with specialized expertise and perspectives brought together by SD
Adapted from (Toskovic, 2016) and (Moritz, 2005)

2.3.5 Main characteristics and working definition

As part of an extensive research to understand how the participants of a SD project understand the field, analyse the impact of the participants' perception on the SD process and incorporate their perspective into the definition of SD itself, (Toskovic, 2016) reviewed the characteristics that were most often related to SD in the academic literature. She identified 28 individual traits from 48 different sources and clustered them into larger groups according to their similarity, listing only those ones that appeared in more than five sources. The 9 most significant characteristics of SD, the aspects they address, their descriptions and their sub-traits or related terms have been condensed in Table 7.

Aspect addressed	Characteristic	Description	Sub-traits or related terms
Actors involved	User-centred	Highlights empathy for user needs and problems as a perspective for designing better services	<ul style="list-style-type: none"> – User needs / empathy – Human-centred – Highlights user experiences – Mediator between organization and users
	Multidisciplinary and collaborative	Facilitates collaboration between stakeholders, representatives of the client organization and/or the service users that have different backgrounds and know-how	<ul style="list-style-type: none"> – Multidisciplinary and collaborative – Highlights informal and tacit knowledge
Process	Holistic	Understands every aspect of the service ecosystem, shifting the focus between the big picture and the details, such as the material and digital components	<ul style="list-style-type: none"> – Holistic – Involves a business model – Observes a service on large and small scale
	Complexity	Tackles open-ended and wicked problems without a clear brief	<ul style="list-style-type: none"> – Complexity – No clear brief / open-ended
	Iterative	Reframes the problem and its solution(s) continuously, to learn and test the viability of the ideas as soon as possible	<ul style="list-style-type: none"> – Iterative
	Heterogeneous process	Operates without a strict pre-determined process, but tailors it according to the requirements of the case at hand	<ul style="list-style-type: none"> – Heterogeneity – Inexplicit or explorative process
Ways of working	Visual methods and prototyping	Utilizes methods that capture services visually in a tangible form (i.e. customer journeys, blueprints or design games) and evaluates which parts of the service deliver value through prototyping	<ul style="list-style-type: none"> – Visual methods / boundary objects – Design-derived methods – Prototyping – Makes services visible and tangible
	Arranges entities into sets of relations	Organizes the way the building blocks of the service (e.g. people, materials, digital systems) operate in relation to each other	<ul style="list-style-type: none"> – Arranges entities into sets of relations
Outcome	Useful, usable and desirable solutions	Designs services that fulfil their functions, are easy to use and meet the needs or desires expected from them	<ul style="list-style-type: none"> – Useful, usable and desirable solutions

*Table 7: The characteristics of SD, their descriptions and related terms
Adapted from (Toskovic, 2016)*

Based on the nine characteristics identified from the publications research, Toskovic performed a critical analysis of each one of them, to contrast the perspectives of different authors. The results of that discussion were then collected together into the following working definition of SD:

“Service design is a design-derived field of practice, which aims at creating useful, usable and desirable service solutions to wicked and complex problems by pursuing a holistic understanding of the whole service ecosystem. Service design processes are heterogeneous, but design the multiple service components and their relations by utilizing a user-centred, multidisciplinary and collaborative approach together with visual design tools and prototyping” (ibid., p. 28).

The definition above, she argued, collected all the necessary aspects to build a holistic image of SD, understand its nature and working ways, the actors involved, the tools and methods employed during its process and the expected outcomes. Nevertheless, a missing key element according to her point of view, was the perspective of the SD process participants, as this definition was elaborated on the basis of the practitioners’ and scholars’ input. The remainder of her thesis research was focused on revealing that missing component and integrating it into the original definition. She concluded that participants acknowledged user-centeredness as the most significant characteristic of SD, but the term denoted different things to different parties (ibid., p. 78). They also connected SD more often to the development of digital services than to the design tradition on which it is rooted, focusing on tangible and practical aspects which highlighted their role in the process. In conclusion, the original definition elaborated from the existing literature proved to be more comprehensive, as contrasted to the narrower approach of the participants (ibid., p. 79).

The criteria above are shared by the author of this thesis, based on his own literature review of services and SD theory. As stated in the beginning of Section 2.3, SD is a holistic approach which cannot be described by its constitutive elements alone. In line with this circumstance, the author considers that the definition by Toskovic has been skilfully formulated using the right words, because it provides an adequate balance between specificity and comprehensiveness, describing each one of the systemic components of SD, but also the unique picture that arises when all these elements are put together. For this reason, it will be also the working definition adopted for the present thesis.

Finally, after reviewing the history of SD, clarifying its relation with other disciplines and providing a reasoned definition to grasp its meaning, the following section will explain some key terminology that forms part of the practitioners’ common language and which will be also relevant for the practical case study work.

2.3.6 Key concepts from practitioners’ language

Service designers conceive services as *dynamic processes* that take place over a certain period of time, created from a series of interactions between customers and the service system (i.e. “the provider”) in a physical environment using physical artefacts, through many different touchpoints during the customer journey, and which produce some *outcome* for the customer, which may adopt in some cases some kind of physical form⁷. (Stickdorn & Schneider, 2016, pp. 36, 40, 44, 80). A visual representation of this definition is provided in Figure 10, offering a clear distinction between the two main components of a service: Delivery process and outcome. Both components can be examined further through the lens of two different models originally outlined by (Grönroos, 2000).

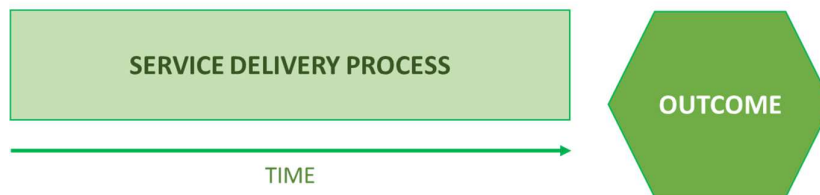


Figure 10: The two main components of a service
Adapted from (Koivisto, 2009)

⁷ As compared to the definition of service provided in Section 2.3.2, this one is more descriptive as it incorporates the language of SD and therefore, it is the one preferred for the remainder of this thesis.

2.3.6.1 *Front-office and back-office*

First, for the service delivery process (Grönroos, 2000) established the Service System Model, based on the core concept of a Line of Visibility that exists to separate those parts of the process which are visible to the customer from those ones which are not. The visible part is called the Interactive Part or front-office, while the part hidden to the customer is called the Support Part or back-office. Customers experience the service only through the interactive part, but the support part is fundamental to enable the functioning of the service and can influence indirectly its outcome. The Service System Model and its layers are shown in Figure 11.

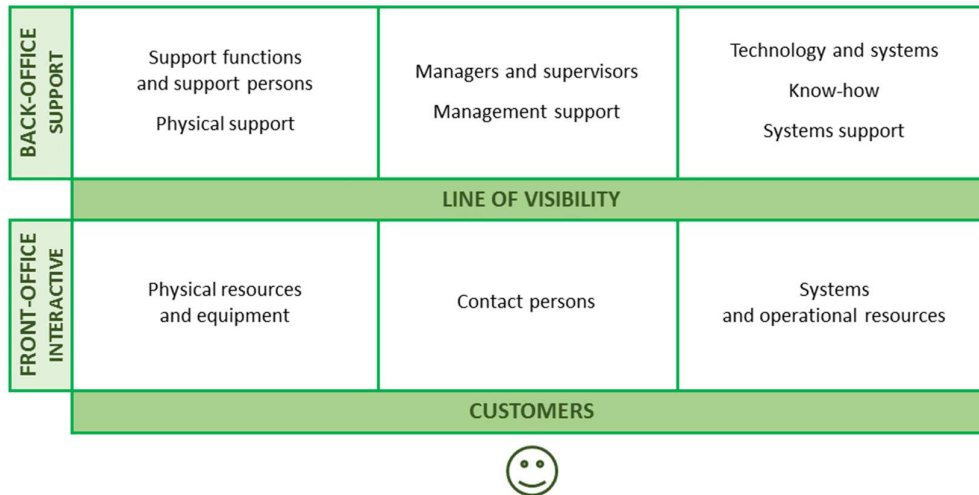


Figure 11: The Service System Model
Adapted from (Koivisto, 2009) and (Grönroos, 2000)

2.3.6.2 *Service offerings and service outcome*

On the other hand, the outcome of a service can be modelled by means of what (Grönroos, 2000) called the Basic Service Package. It describes the two dimensions that must be covered to fulfil the needs of the customers: The core service, which satisfies the primary needs and determines in ultimate instance what the customer will receive from the provider; and the supplementary services, which are necessary to carry on the core services and allow differentiation between competing companies.

For instance, the core service of an airline is transportation, because that is the primary customer need that aims to be fulfilled. Meanwhile, everything else that the airline offers can be considered supplementary services. Some of them, like ticket purchasing and check-in are mandatory and therefore considered facilitating services, whereas all the other additional and optional perks that simply add convenience and allow differentiation between competitors, like in-flight entertainment, meal selection and frequent flier programs are considered supporting services (Koivisto, 2009).

The hierarchy of this Basic Service Package model is also represented in Figure 12. However, since services are produced and consumed through customer-provider interactions, (Koivisto, 2009) argues that service offerings cannot be considered only by their (final) outcome, but also need to include three more elements to take account of the customer's perception during the entire process leading to that particular outcome. These elements are:

- **Accessibility of the service:** Elements that affect how easy or difficult it is to buy or use the service, for example the schedules, locations and skills of the staff
- **Interaction with the organisation:** The communication channels available and how direct they are, the availability and experience while interacting with physical and technical resources, systems or appliances, and the possibilities to interact simultaneously with other customers
- **Customer's participation:** When the involvement of the customer produces noticeable effects in the service he perceives

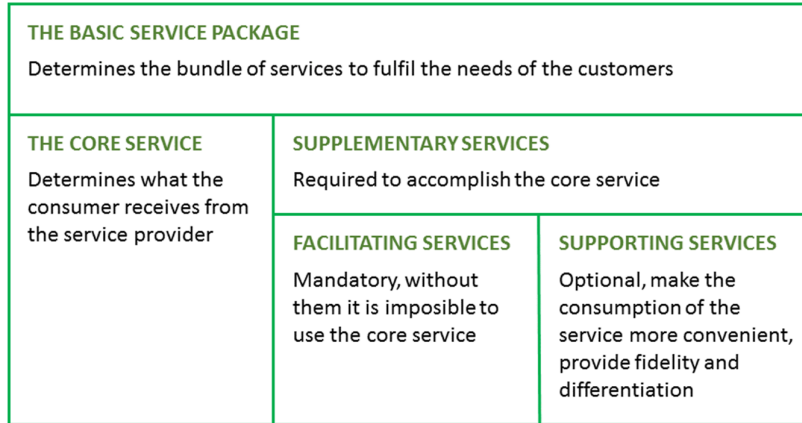


Figure 12: The Basic Service Package
Adapted from (Koivisto, 2009) and (Grönroos, 2000)

2.3.6.3 Participant roles

An important distinction should be made between the people who participate in the process of *designing* the service and the people involved in the process of *delivering* the service. Service designers participate only in the first one as external actors who aim to understand, (re)create, improve and innovate on the latter. Customers, on the other hand, are the group of people who participate in the service delivery process as co-producers to obtain their desired outcome – either directly as buyers, or indirectly by influencing in any other ways the service experience (Koivisto, 2009). Customers need therefore to be also actively involved in the design of those services as co-designers.

There is potentially more than just one group of customers with different needs and expectations (Stickdorn & Schneider, 2016, p. 38). Furthermore, the service delivery process involves other groups of people, who also participate on its creation, provision and delivery, even though they are not the recipients of the service outcome themselves. These people can still contribute with their expertise and competences to the definition of the user requirements, the suggestion of technical solutions, or even to determine the visual aspect of the service touchpoints and service evidences (Colleoni, 2016). Any person or entity that has an interest in the service delivery process and thus contributes to its design can be considered a stakeholder.

It is the main task of the service designers to consciously generate an environment that facilitates the generation and evaluation of ideas within heterogeneous stakeholder groups. The selection of participants during the design process should be representative enough to recreate the service and procure a smooth interaction during the actual delivery process (Stickdorn & Schneider, 2016, p. 39).

2.3.6.4 Customer journey, service moments and touchpoints

Based on the systemic understanding of services as dynamic processes with an outcome, it is a common practice of SD professionals to make the analogy of services as movie-like sequences composed of many different photograms, each one representing a moment of interaction between the customer and the service system (Stickdorn & Schneider, 2016, p. 40). These individual moments of interaction are known as service moments and can take place through a wide variety of contact mediums, also called touchpoints. Among the common sub-categories of touchpoints are channels, objects, processes and people (Koivisto, 2009). The sequence of all service moments put together one after another is described in the SD literature as the customer journey. Customer journeys often reflect the single unique point of view of a persona, the term used to describe an idealized fictional person, based on a real customer or customer segment (Korhonen, 2015, p. 41).

From a practical point of view, these concepts help to address the complexity of the design activities, turning the intangibility and abstractness of services into a more manageable form (Korhonen, 2015, p. 36). By modelling existing services or creating new ones as a sequence of moments using the customer’s journey perspective, the service delivery process and its outcome can be approached by looking at both the macro (i.e.

organizational) and micro (i.e. individual interaction) levels, facilitating also the continuous iterative improvements of these components. Any service moments that the customer does not like or do not provide value should be deleted from the customer journey. Similarly, the customer journey can be prolonged at the beginning (pre-service), the end (post-service), or even in between existing service moments, to satisfy new customer needs and generate additional revenue opportunities (Koivisto, 2009).

2.3.6.5 *Servitization and productization*

The IHIP framework established clear distinctions between products and services, with the aim of providing guidelines for companies selling either one of them to establish their concrete marketing strategies. However, many companies that traditionally sold only products are being challenged nowadays to increase their profitability, growth and customer retention by selling service propositions altogether with those products. This has led to the development of new product-service hybrids, also called product-service systems (PSS) or hybrid products (Miettinen, 2016). They support the idea that the distinction between goods and services is not relevant for the customers, but what matters are the solutions and value provided to them by any combination of both elements (Colleoni, 2016). Therefore, this distinction should not be relevant for companies either, demanding a cultural and strategic transformation into solution providers. Organizations that bring complementary services into their existing products are engaging in a process known as servitization. On the other hand, organizations that incorporate product-like elements for the development of new service offerings are adopting instead the strategy of productization⁸. These two concepts should not be regarded as antonyms but more as having “reverse directions”, as the link between them is considered by scholars a result of the existing correlation and convergence between the manufacturing and service sectors. Each one of them could thus be positioned in the opposite ends of the same imaginary PSS continuum, in what could be regarded as “two faces of the same coin” (Leoni, 2015). The described scenario is depicted in Figure 13.

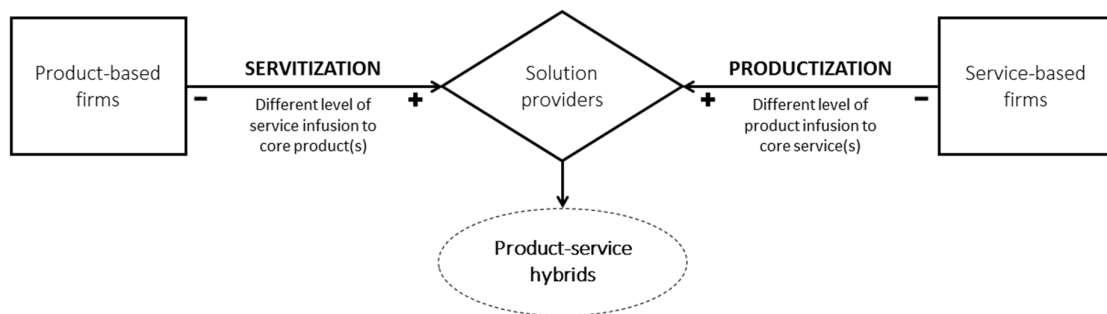


Figure 13: The solution provider firm
Adapted from (Leoni, 2015)

The term servitization was originally adopted by (Vandermerwe & Rada, 1988) to describe the customer-driven process by which modern corporations added value to their offerings through packages or “bundles” of goods, services, support, self-services and knowledge. Among the advantages of servitization, they highlighted the creation of competitive barriers to differentiate from other companies offering similar products and to increase customer fidelity. They also analysed how technology was responsible for making services more transparent, giving customers a greater bargaining base and turning them more demanding and critical.

Based on these initial premises and after reviewing 58 papers published during the next two decades, (Baines, Lightfoot, Benedettini, & Kay, 2009) defined servitization as “*the innovation of an organization’s capabilities and processes to better create mutual value through a shift from selling product to selling PSS that deliver value in use*” (pp. 555, 563) and identified three main drivers for companies to engage in the process: financial (e.g. increased revenue streams and profit margins), strategic (e.g. raising competitive advantage and establishing market barriers) and marketing (e.g. improvement of customer relationships and product differentiation) (ibid., p. 558).

⁸ Some academic publications use equivalent terms with the alternative spelling “productisation” and “servitisation”.

Given that servitization is a process which takes place inside the continuum of PSS, the degree to which a product can be “servitized” varies greatly, ranging from products that have supporting services only as “add-ons” to products in which the main value driver are the services themselves, while the tangible goods become the “add-ons” (ibid. p. 556) (Colleoni, 2016, p. 12). The levels of this scale were better conceptualized by (Thoben, Eschenbächer, & Jagdev, 2001) as a layer model of “extended product”, in which the core product is wrapped by additional functions, first the tangible ones and then the intangible, as illustrated in Figure 14.

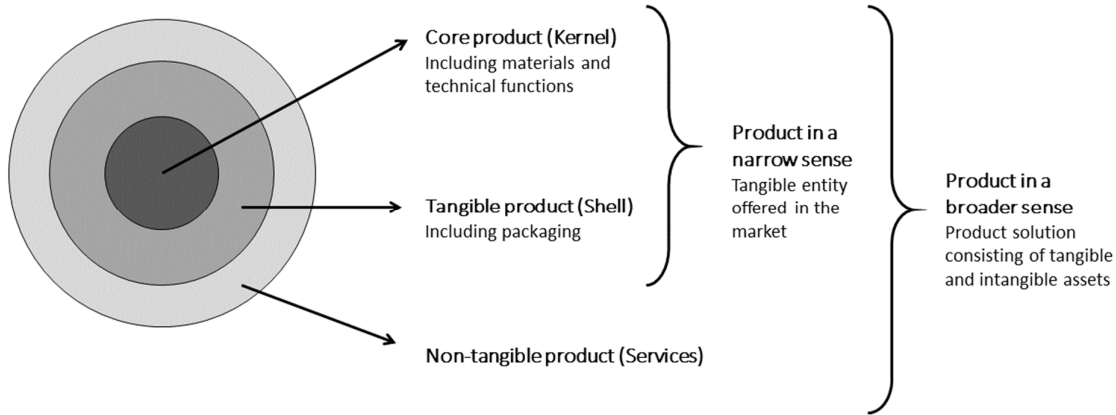


Figure 14: The layer model of extended product
Adapted from (Thoben, Eschenbächer, & Jagdev, 2001)

As more layers are added surrounding the core product, a greater portion of the value-share can be attributed to the intangible assets. The services infused into the core product switch the focus from supporting the product to differentiating it, until they finally become the main offering for the customer. This process is shown in Figure 15.

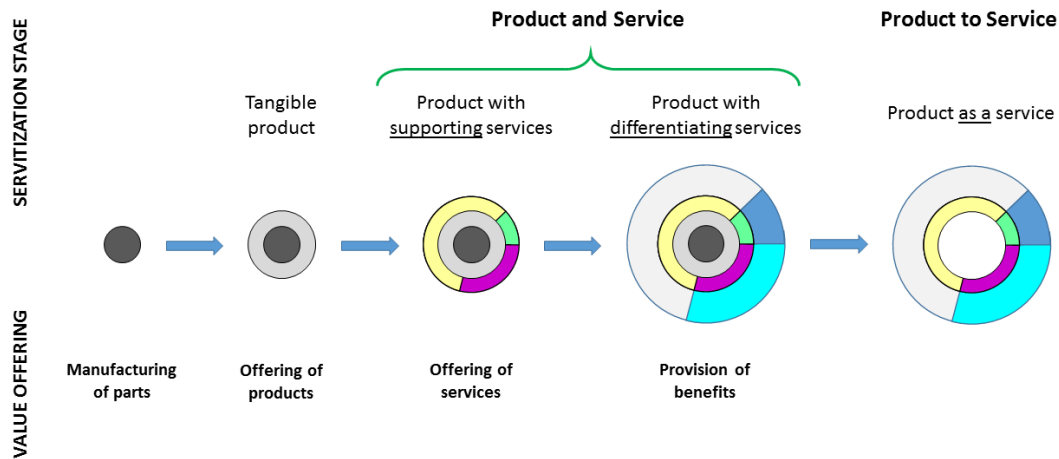


Figure 15: The servitization process
Adapted from (Chen & Cusmeroli, 2015) and (Thoben, Eschenbächer, & Jagdev, 2001)

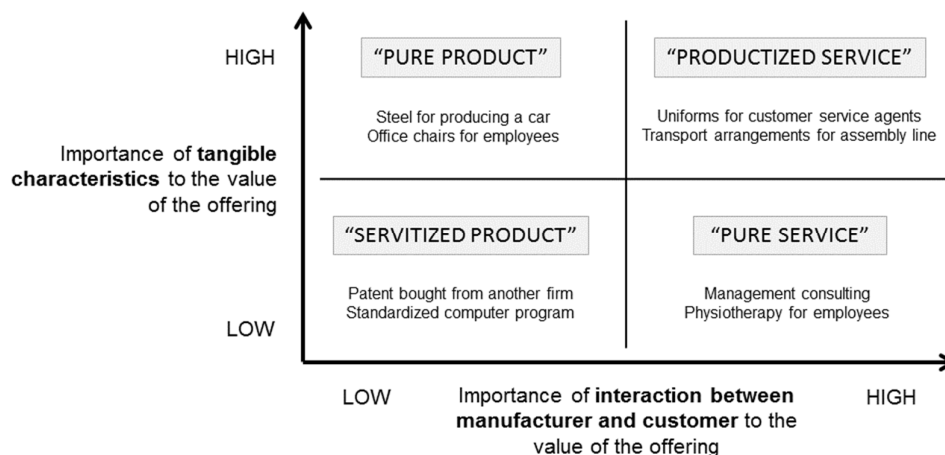
On another hand, (Harkonen, Haapasalo, & Hanninen, 2015) define productization in general terms as “the process of analysing a need, [translating,] defining and combining suitable elements, tangible and intangible, into a product-like object, [which constitutes] a standardized, repeatable and comprehensible (...) offering that can be sold to customers to satisfy their needs”. This process deals with the abstract and intangible nature of services by clarifying the offering, addressing inefficiencies and making them more tangible, product-like, scalable and repeatable (ibid., pp. 70-71). From the customers’ point of view, productization increases brand recognition and enables a better understanding of the service (ibid., p. 70) (Colleoni, 2016, p. 11).

The strategies adopted by managers of small professional service firms to engage into productization were analysed by (Jaakkola, 2011). She identified the following three common practices:

1. **Specifying and standardizing the service offering:** To facilitate the marketing strategy by making it clear to the customer what the company is offering. This is achieved by standardizing at least to some extent the service or dividing it into smaller parts (e.g. “service modules” or “packages”) that can be easily explained and sold to them, separately or together. This also helps the company to save costs in the standardized parts of the service, which can be reused with many different customers, or create new offerings with minimal customization.
2. **Tangibilizing and concretizing the service offering and professional expertise:** To make the offering more tangible in the eyes of the customer, reducing the perceived risk of acquiring the service due to its traditional abstract nature and the lack of evidence. It can be achieved for instance by developing brand names or visual identities, or providing tangible materials such as brochures, leaflets or cardboard packages, which illustrate and explain clearly the service delivery process and outcomes. This also allows to communicate the competence and trustworthiness at company-level, rather than at the level of the individual employees who maintain frequent contact with customers.
3. **Systematizing and standardizing processes and methods:** To develop more systematic and unified methods, tools and processes to make the service delivery more controllable, particularly when it comes to routines or repetitive tasks. Standardization is not only a pre-requisite for delivering the same quality to all customers, but also reduces the person-centricity of the service on individual professionals in terms of their knowledge, customers and projects. This can be done for example by developing document templates, process charts, databases and analysis methods that systematize the processes and centralize the know-how from the individual experts inside the company.

(Shostack, 1982) argues that all products and services are indeed product-service hybrids, and that the balance between the goods and service elements is what determines at the end if the combination will be perceived by the customer as a product or a service. Nevertheless, companies like the one addressed in the case study are still struggling to determine what is the best equilibrium between products and services to maximize the real value for their customers, as they realize that the bundling does not always result in the expected performance outcomes. Although literature on the subject is still at early stages, (Kuijken, Gemser, & Wijnberg, 2017) proposed a framework to guide the design of effective PSS, based on the following three principles:

1. The product or service elements should have sufficient autonomous value to be sold separately as stand-alone offerings on the market
2. The combination of the separate offerings should create synergy in terms of its added value
3. Each one of the offerings should come from a different quadrant of the 2x2 matrix that allows to contrast their degree of intangibility and interaction, shown in Figure 16



*Figure 16: Framework for designing effective PSS
Adapted from (Kuijken, Gemser, & Wijnberg, 2017)*

3 Case study: WellEdu Fennica Oy

This chapter provides an insight into the case of a Finnish start-up company which aims to sell their ECEC services in selected growth markets as an export product based on a franchise model. It begins with a description of the company and the role of the author during the period in which the research took place, followed by a description of the methods used to collect the information. It continues with a walkthrough description of how the process unfolded. Finally, it lists and describes the results obtained from the research.

3.1 Company presentation

WellEdu Fennica Oy was established in 2015 by Noora Laitio, an economist specialized in cross-border finance and impact investment, and Jonna Kangas, professor and researcher of play-based methodologies for ECEC. The idea matured across a few years, as Noora observed there was a high interest for Finnish education abroad. During her assignments as advisor for the World Bank Group in developing countries, she got frequent inquiries about the options available to capitalize on the know-how behind the successful PISA results of the Nordic country, and particularly the special features of the ECEC system. She found herself unable to provide an answer, because there was no educational product ready to be exported yet. This led her to take the decision of starting her own company to provide a comprehensive, affordable and scalable solution to attend the needs of growing economies in terms of children's education, care and development, inspired mostly by the success stories of similar international franchises such as Bridge International Academies in Africa.

After some inquiry among acquaintances and a tailored professional search, Noora got in contact with Jonna, who was already familiar with participatory play-based pedagogical methods and had direct involvement in the creation of the Finnish ECEC curriculum guidelines. They began to develop their own franchise concept as a single package that would provide all the necessary components for the operation of a Finnish ECEC centre. Their "school-in-a-box" aimed to address five main challenges identified in the target markets:

- Lack of teacher education and guidance
- Lack of age-specific programmatic approach and structured content
- Access and inclusion
- Lack of quality controls and benchmarking
- No value in money to the consumer in the private sector, although parents are willing to pay

To achieve their goal, they proposed the design of a programmatic and comprehensive curriculum based on the latest research in participatory learning, play-based pedagogy and phenomenon-based learning. Teachers would receive scripted day-to-day classroom instructions along with the curated contents and reference materials. Additionally, they would provide educational staff with initial training sessions to learn about the core concepts of Finnish ECEC and continue developing their professional skills throughout the school year by completing remote on-the-job assignments. Monitoring and assessment of KPIs for both students and teachers would be incorporated on their system, to assure the consistency and quality of the services.

Since the earliest concept presentations, they had marketed the use of technology to support several aspects of the franchise package. Terms such as "mobile platform", "content distribution" or "teachers' community of best practices" reflected upon this intention to employ ICT as a strategic asset for the scalability and cost-efficiency of their solution. Being unable to find any ready-to-market product inside Finland that would cover all their needs, they started to look abroad for other alternatives that would allow them to test their proposal. They finally opted for an online platform and mobile app provided by a Singaporean company specialized in educational software.

At the time of this research, the company has become increasingly familiar with the usage of the outsourced software and prepared a demo environment, which is used to showcase some of their pedagogical contents, the documentation of children's learning process and the follow-up by parents. However, the company is still struggling to persuade decision makers, investors and potential partners about the convenience and effectiveness of their solution, as the selling process of ECEC proves to be complex and time consuming.

The present case study and thesis are framed inside the strategic challenge of making the technology offer less abstract, by proposing changes to the existing products or proposing new ones which support the processes in better and innovative ways. Even though the company services aimed to be sold as a single packaged franchise solution, any other viable commercial strategies will be also taken into consideration.

3.2 Research process

The case study is composed of three consecutive stages presented in the following sections of this chapter. The first two parts reflect the empirical knowledge of the company team members, as understood and collected by the thesis author throughout observations and SD workshops, respectively. The third section provides a brief overview of the broader competitive situation and some other actors involved in the market of ECEC services export. In other words, the first two stages reflect the internal situation of the company during the first half of 2017, whereas the remaining stage provides the external picture during the same period. These phases are shown in Figure 17.

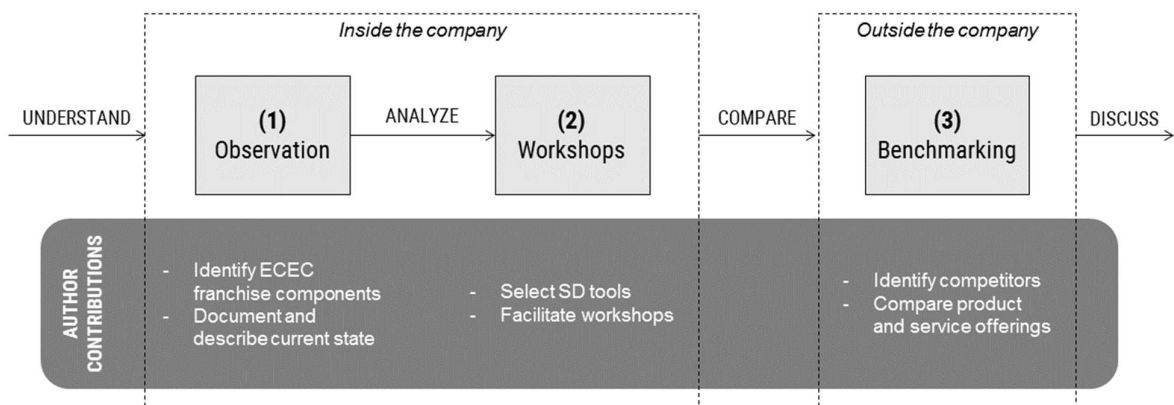


Figure 17: The case study process and author's contributions during each phase

The observations were carried out while the author of this thesis was working in the company under the role of Business Development Associate. One of the main duties for this position was to maintain strategic contacts with potential investors and customers in Spanish-speaking markets, helping the Finnish team members to offer their services more effectively, by bridging any communication and cultural gap differences between Finland and Latin America. Another important task was to define and supervise the technical requirements with the company's external software provider based in Singapore. The author's contribution for this phase was the analysis and documentation of the core components of ECEC franchise offered by the company.

After the observations, two workshops were organized with company staff located in Finland (i.e. attending in person) and abroad (i.e. participating remotely), to understand in more detail some of the aspects identified during the previous phase. All the workshop participants had professional background in areas related to pedagogy, finance or management, with limited knowledge about technology. Therefore, SD methods were used to collect their expertise in more playful and engaging ways, without addressing directly any complex technical issues. The author's contribution during this phase was to ideate and conduct the workshops as an "external" service designer⁹.

The information collected from observations and workshops allows to create a full picture of the company service offerings and business strategy. This baseline was used to search and compare similar alternatives in the market of Finnish ECEC exports, during the third phase of the case study. The author's contribution during the benchmarking phase was the identification of competitors and comparison with similar Finnish ECEC product and service offerings.

⁹ However, as it will be discussed in the next chapter, having previous knowledge about the internal workings and daily operations of the company may interfere with the neutrality required to act effectively as a consultant.

3.3 Data collection

3.3.1 Observation

This section provides a general overview of the key ECEC service offerings identified by the author during his working period inside the case study company in the first semester of 2017. The continuous daily interactions with other team members coming from a pedagogical background were generalized into broader categories or topics through inductive reasoning, providing thus an initial list of candidate ECEC components.

This list aims to summarize the educational and pedagogical expertise that should be packaged into a replicable and distributable educational product. It should be noted that it is broadly defined and non-extensive, as it represents the rationalization of the product-service offerings from the perspective of a “newcomer” employee (i.e. the author) to analyse the company situation and plan the activities to be executed in the following case study phases. The distinctive franchise components are explained in the following sub-sections.

3.3.1.1 ECEC contents

For the last two years, the case study company has been working on the ECEC curriculum and its associated pedagogical contents, designed for the age groups between 0 and 6 years. These contents provide all the necessary information for teachers and school operators to manage the front-stage of ECEC (i.e. teaching-learning activities). It is composed of age-group and period-based learning goals, daily teacher instructions and classroom activity descriptions.

The company does not aim to position itself in the market as a content producer, so the curriculum, the teacher instructions and activity descriptions cannot be purchased separately. The main strategy and revenue model is to sell the educational contents along with their school franchise, which is advertised as a scalable turnkey solution, or in other words, a “Finnish school-in-a-box”.

Half of the personnel in the case study company is dedicated full-time to the creation of the pedagogical contents. This group is usually referenced as the “product team”, suggesting that even if the company does not consider itself to be competing in the content production business, the ECEC curriculum *is* currently the core product. Based on the observations, it can be also inferred that any other potential services are often relegated to a secondary role in supporting or complementing the content creation and distribution (i.e. mostly a G-D logic vision).

The ECEC curriculum has been designed upon the three pedagogical approaches described in section 2.1.3 above: Play-based pedagogy, participatory learning and phenomenon-based learning. Moreover, the content structure follows well-defined cycles per period, week and day. In a school year, there are five thematic periods of six weeks each, covering topics that support the concepts of active agency and “whole child” approach explained previously in the literature review:

1. Children’s self-identity, belonging and self-image
2. Active learning through participatory pedagogy
3. Children’s relations with their peers, family and society
4. Children’s citizenship and humanism as active members of society
5. Self-evaluation and own goals for life-long learning

Children explore the same phenomenon during an entire week, but each day offers a different perspective to approach it, based on a combination of various orientations from the Finnish ECEC curriculum guidelines (see 2.1.3.3 above):

- Mondays: Storytelling, language, culture and history
- Tuesdays: Exploration, nature and science
- Wednesdays: Arts, crafts and music
- Thursdays: Lifestyle, health and wellbeing

Fridays are destined for a recap of the weekly phenomenon, giving the teacher a chance to reinforce any aspect of learning, either at individual/child or class/group level.

Every day of the week, the teacher must follow a similar routine composed of five stages that combine directed group activities and free play:

1. Gathering the kids and warm-up to get their attention
2. Presenting and explaining the daily topic
3. Guided exploration activity to exercise the topic concepts
4. Play-based activity to stimulate children's creativity
5. Documenting the daily learning outcomes

3.3.1.2 *ECEC environment*

According to the pedagogical experts of the case study company, the infrastructure and interior design of ECEC spaces should be flexible for two reasons:

1. Children are constantly learning and changing during their first years of life. Therefore, their environment should also adapt to reflect the need for continuous exploration and discovery
2. To keep up with the latest trends and follow current research, which outlines the different types of activities that must be conducted during the teaching process

From a practical point of view, designing and equipping the educational spaces with flexibility and adaptation criteria in mind is also necessary to enable the functioning of the five stages of the daily cycle, which includes both teacher-guided and free-play activities. If the franchise is sold to existing school operators, the possibilities to adapt the infrastructure and interior design are limited. In these cases, special furniture arrangements or additional equipment may be needed to replicate the appropriate Finnish ECEC environment.

Considering the stages of the daily teaching process, the interior spaces should be distributed in such a way that participatory, playful and shared activities can be re-arranged easily. However, at any point of the daily cycle, children may also feel the need to disengage from the process flow and have their own individual "time-out", in which they could for instance take a nap or listen to music. Therefore, the building should also have separate, smaller rooms or environments for individual rest and relaxation time.

Appendix 1 shows various pictures of the outdoors and interior spaces of ECEC centres visited in the metropolitan area of Helsinki.

3.3.1.3 *Educator competences and skills*

In the franchise package of the case study company, an initial two-week training is provided to update the educational staff in the Finnish ECEC methodologies and the use of the technological support tools. Every teacher trainer should be thus able to follow the same training agenda and carry the sessions based on the standardized materials provided by the company HQ. These materials have been originally produced in English, and while there are some contents already translated into other languages, it is still unclear if the face-to-face training is going to be conducted entirely in English, entirely in the local language of the target market, or will rely on some type of simultaneous translation, as the Finnish trainers may not speak the foreign language, or the teachers in the foreign country may not speak English.

Besides the initial training, the company wants to provide continuous professional development to teachers across the entire school year, with remote on-the-job assignments every period. All interactions should be mediated remotely by an online platform, connecting teachers in different school branches around the world and the educational experts in Finland. At the present date, the development of the software destined to the teachers' distance learning has yet to be commissioned.

3.3.1.4 *Pedagogical leadership*

The company arranges frequent visits to ECEC centres in the Helsinki metropolitan area to showcase as real-life examples of the local system to potential partners and customers who come from abroad. During one of these visits to a bilingual ECEC centre located in the Suurpelto district of Espoo city, the school manager explained his point of view about the importance of separating the operational management aspects from the pedagogical activities that take place inside the classroom. He argued, based on his past experiences with pre-school units in the UK and Finland, that a clear separation of functions between administrative and educational

staff enables a better operation of the ECEC centres: Having a dedicated school manager to deal with HR requirements, supplies and inventory, legal paperwork, and any other time-consuming activities allows the head director to focus exclusively on the daily care and attention of children.

This experience opened an internal debate within the team about the importance to set guidelines for managerial roles and functions, as there are no clear definitions yet in the franchise documentation. From the author's perspective, the company co-founders seem to acknowledge the importance of partnering with individuals possessing strong management skills and capable of maintaining the same quality standards across all ECEC centres, but at the same time they appeared hesitant to impose any restrictions on how the local operators should arrange their staff. This could be mainly because of the cost of opportunity that would represent excluding all the potential operators who do not comply with the minimum staff requirements.

3.3.1.5 ECEC partnership between staff and parents

Altogether with the franchise offering, the company provides a mobile application developed by their external software provider in Singapore, so parents can review their child's learning reports, follow any news from the school and keep themselves informed about class events. Through this channel, they also receive push notifications about emergencies and other important updates. During the observation period, there were various team discussions about the level of participation that parents should be allowed to have through this app, or any other technologies provided to facilitate communication, as certain cultures tend to be more involved in the school matters than others. For instance, a potential partner in India specifically requested to disable any bi-directional messaging features because parents are "too curious" and may try to intervene in the daily activities of the ECEC centre. On the other hand, a contact in Peru expressed her desire of getting new tools to engage parents in their child's education and care, as they are usually uninformed or apathetic toward the school events and activities.

3.3.2 Workshop 1

3.3.2.1 Methodology

The first team workshop was conducted in the Computer Department of Aalto School of Science on the 24th of May, 2017. Both the pedagogical and commercial members of the team (altogether 6 people) attended this session, which had the purpose of identifying the stakeholders for the ECEC services that the company provides, and whether any of the identified groups has a relevant influence over the design of the supporting technology needed to deliver those services.

Two questionnaires in tabular format were given to the participants to fill out anonymously. The first one provided a list of proposed stakeholders, either identified by their name or as a category (e.g. teacher, school director, franchisee partner). For each one of them, the participant had to determine whether the proposed person or category was indeed a stakeholder, a customer who pays for the company services, or a user of the technology provided by the company. More than one option could be selected simultaneously for each person or category. In the cases where real names of former contacts were given, only one example was provided per each archetype of potential partner or customer. For instance, only one contact name was given to represent all the potential partners who want to build a new flagship school branded under the franchise, and only one contact name was given to represent any companies willing to buy the educational curriculum and commercialize it under their own brand. The initial list was based on the author's own experience performing the Business Development functions inside the company. Additional blank lines were also provided at the end of the form, so each participant could propose one or more of her own stakeholder candidates, if they were not included already in the list. After each participant completed the form, time was given for comparing the individual results with the rest of the group and conducting an open round of discussion. The original template and list of candidate stakeholders for this questionnaire is available in Appendix 2.

The second questionnaire consisted of a list of several activities, processes or tasks performed by some of the potential stakeholders listed in the previous form, who participate or interact directly in the daily operations of the pre-school units (e.g. teachers, directors and parents). The initial list of activities was based on the author's own experience inside the company and frequent interactions with the pedagogical and commercial team members. In this case, participants were asked to measure inside a 3-level scale how necessary is technology in their opinion for the fulfilment of each one of the listed tasks, grading its relevance as "not needed at all",

“helpful but not necessary” or “completely necessary”. Only one of these three options could be chosen at a time. These results were internally given numeric weights equivalent to -1, 0 and 1 respectively, for purposes of calculating an estimated measure of “perception rate of technological impact” among the entire team. Additional empty lines were provided as well at the end of the form, to allow participants to suggest new tasks that they considered relevant enough to include in the list. The original template and list of tasks for this questionnaire can be found in Appendix 2.

Before filling out the questionnaire, participants were also reminded that it was not a test of their knowledge about the company, but an exercise to learn their individual points of view about the stakeholders, to discover for which one of those stakeholders they consider technology should be specifically designed and to assess how much importance they place on technology for the successful completion of the stakeholder’s tasks. Therefore, there were no right or wrong answers, simply different points of view that had to be externalized and discussed together to create a shared company vision and goals.

As soon as the second questionnaire (i.e. tasks list) was handed out, one of the participants also noted that the form heading simply stated “Technology is...”, which derived into an interesting point of discussion: Should the supporting technology be the company’s *own* technology developed in-house, to guarantee a full control over its quality and provide additional value to the customer, or *any* partner technology included as part of the franchise package would suffice to cover these requirements, regardless of who and where is this software provider located? The participants were then instructed to check the respective boxes with the assumption that the company itself must develop those required technologies, but they would be given the chance afterwards to justify the reasons why they think any generic outsourced solution would also suffice. After the participants finished filling-out the form, discussion was centred around the additional tasks proposed by them, which were mostly related to the automatization of feedback gathering, continuous quality assurance and the provision of bi-directional communication channels between the educators and the franchise central management team, so any teacher could contribute to the improvement of the curriculum contents.



Figure 18: Participants filling out questionnaires during Workshop 1

3.3.2.2 Results

The results of the two questionnaires were collected into a single spreadsheet, adding up the following results:

STAKEHOLDERS

- 1) Most team members identified the following people as key STAKEHOLDERS, denoting that the company depends strongly on them because of their key resources needed to deliver the services:
 - a. Outsourced technology provider in Singapore
 - b. Investor (i.e. angel or venture capital)
 - c. Finnish architecture and interior design firm specialized in educational spaces

- 2) Most team members identified the following stakeholders as target CUSTOMERS, or those who will take the decision of paying or not for the services, which suggests that these people are the ones who need to be fully convinced and satisfied with the product-service offerings:
 - a. Franchisee partner (i.e. country/region operations and sales)
 - b. Potential partner in India interested in acquiring the franchise license for her school
 - c. School director/head
 - d. School operator/manager/admin

- 3) Most team members identified following stakeholders as the target TECH USERS, who could be seen as the people setting the requirements for the design and provision of technology:
 - a. Teacher
 - b. School director/head
 - c. School operator/manager/admin
 - d. Parents

STAKEHOLDER TASKS

- 4) Most team members indicated that TECHNOLOGY IS NOT REQUIRED for the following tasks, which may indicate that investing time, effort and money in creating technology for these purposes is unadvised, as they would not deliver any significant value to the customer:
 - a. Organize events and presentations
 - b. Select local stories, songs or poems
 - c. Match franchise curriculum with local curriculum

- 5) Most team members indicated that TECHNOLOGY HAS A LOW IMPACT for the following tasks, which suggests that their automation will provide low value for the users and is not a decisive factor to prefer the company services, as they have other priorities that require specialized technology:
 - a. Select or decide class activities
 - b. Publish description of class activities
 - c. Read description of class activities
 - d. Communicate with the parents or relatives
 - e. Create training material for teachers
 - f. Feedback / Reflect on franchise curriculum
 - g. Update child's personal information
 - h. Publish school news
 - i. Track child's attendance
 - j. Define learning targets
 - k. Register child's personal information
 - l. Collect materials for arts' day
 - m. Prepare the classroom

- 6) Finally, most team members indicated that TECHNOLOGY HAS A HIGH IMPACT for the following tasks, which could maximize the value that can be delivered to the users and optimize the resources spent on technology design and development:
 - a. QA / self-reflection of teachers
 - b. Follow child's participation
 - c. Take photos during child activities
 - d. Prepare child reports
 - e. Document executed class activities
 - f. Train teachers
 - g. Explain how to use web platform
 - h. Explain how to use mobile app
 - i. Publish child reports
 - j. Access and read child reports

- k. Measure accomplishment of learning targets
- l. Register children
- m. Unenroll children
- n. Give feedback to peers (i.e. educators)
- o. Feedback / Reflect on product quality

As a final point of reflection from this workshop, the collected data also suggests that the entire team has put high expectations on the technology they should provide, since the list of "high impact" tasks was the largest one. These same expectations could be accurately or wrongly transmitted to other stakeholders, so the participants were advised to procure that their communication strategy (e.g. emails, presentations, documentation) corresponds to the actual products and services that can be delivered to the customers.

3.3.3 Workshop 2

3.3.3.1 Methodology

A second workshop was conducted in the Computer Department of Aalto School of Science on June 1st, 2017, with the objective of gaining a deeper insight into the most relevant stakeholders identified during the first session. The focus was not only on providing a better description of these actors involved, but also on how they are interconnected by means of the resources, either tangible or intangible, that they bring into or take during the service delivery process, or in other words, their interdependencies and needs. Another objective was to represent in a visual way the closeness of these actors between each other and with the company. For these purposes, the stakeholder map was selected as the most appropriate tool to involve all the participants in the discussion and to translate into a tangible artefact their understanding of the complex relations.

The stakeholder map is a visual representation of the various groups involved with a particular service, usually in the shape of various circles contained within each other (Stickdorn & Schneider, 2016, pp. 150-151). It allows to chart and analyse the interplay between these various groups, a set of connections also referred to as the innovation ecosystem. As Kimbell suggests, the creation of a collective visual map provides a shared understanding of the complex world of people, things and organizations involved in co-creating value. It also allows to highlight mundane details that are sometimes omitted, and explore what could happen in the future by adding new actors and capacities, or combining the existing ones in different ways. The stakeholder map can be therefore used to analyse the current ecosystem (the as-is), or to assemble actors and capacities together into a new one (the to-be) (Kimbell, 2014).

Various gamification rules were devised by the author to increase the engagement of the participants during this session. The stakeholder map was introduced to them as an "RPG game board" on which they would have to place and connect their "characters", represented by paper cards with the name of each stakeholder identified during the first team workshop. Additionally, each character could be personalized with two types of attributes:

- "Requires (-)", which describe the needs or inputs that they would receive from another character, and
- "Provides (+)", which describe the outputs (i.e. resources, products or services) they offer

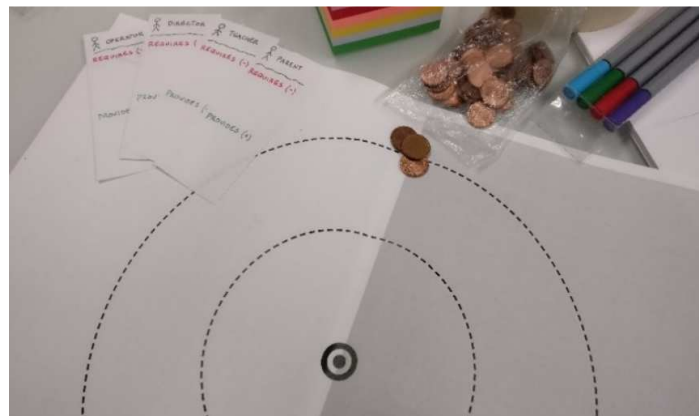


Figure 19: Game board and cards for Workshop 2

Each player was given her own stakeholder map and set of stakeholder cards, and instructed to start filling out their character profiles. Once they had completed all profiles, they had to place the cards on the board depending on their “closeness” to the company. The stakeholders that had a direct contact with the company team members were positioned inside the inner circle, closest to the centre point of the stakeholders’ map. Meanwhile, the stakeholders that had only an indirect communication through some other character – or no communication at all – had to be positioned on the broader outer circle.

The point system was explained to the participants. Their objective was to find all the possible connections between two or more characters, by linking their “Requires (-)” and “Provides (+)”. The connection had to be always of the type “(+)/(-)”, representing the mutual interdependencies between each stakeholder. They could also create new character cards to enable new stakeholder connections, but they had to use all the characters available. Points were awarded per the following rules:

- Unused character: -10 points
- New character: +10 points
- Linked two characters (+/-): +3 points
- Unlinked require (-): -1 point
- Unlinked provide (+): +1 point

Finally, participants could also spend a token to temporarily “spy” on any of the other participants’ characters, selecting a card by looking only at its stakeholder name. This would allow them to copy any “Requires” or “Provides” they did not have before in their own cards and thus enable more potential links.



Figure 20: Participants filling out the stakeholder map during Workshop 2

3.3.3.2 Results

During the workshop, each participant had her individual stakeholder map with its own actors and relations. Therefore, to process the results a new unified map was created, reflecting the common mindset in the company and highlighting the parts where each participant had a different opinion. Each individual map was reformatted for consistency and “overlapped” on top of the others to create a complete resulting picture, as illustrated by Figure 21. The position of the actors was standardized and kept the same in every map, based on the approximate average distance to the centre point. The relations were assigned an initial numeric weight of 1, which increased every time the same relation was mentioned by another participant, making a sort of analogy with “frequent routes” or a “heatmap” of relations between two stakeholders in the ECEC export ecosystem.

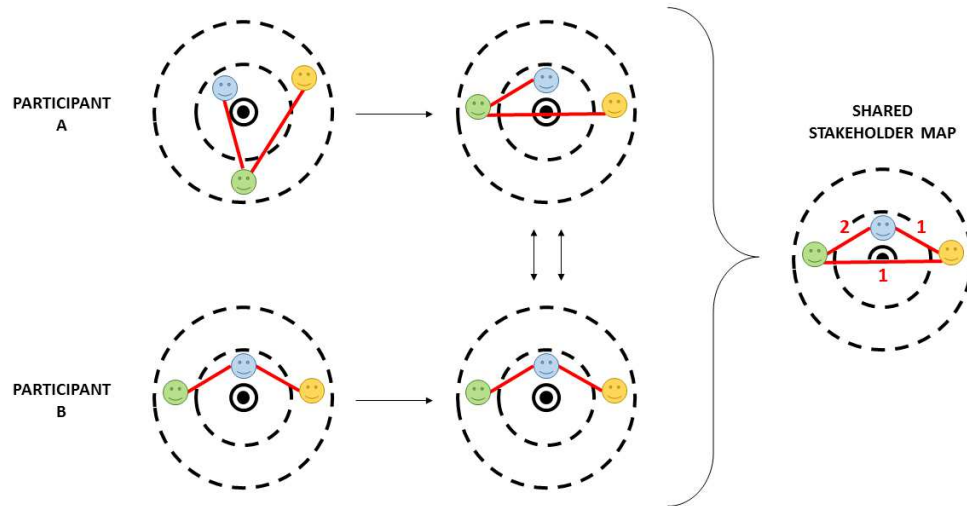


Figure 21: Creation of a unified stakeholder map for the case study company

The first step of processing the results into a single map was to identify in which circle the participants located each stakeholder, suggesting how direct they consider the communication maintained between them and the company. The results are listed on Table 8.

Stakeholder	Inner circle (direct communication)	Outer circle (indirect or no communication)
Franchise operator	4	0
Principal / Head of school	2	2
Parent	0	4
Teacher	0	3
Trainer	1	0
Local training center	0	1
Pedagogical expert	1	0

Table 8: List of stakeholders and their level of contact with the case study company

From the results indicated above, the following observations can be inferred:

- The principal or head of school is considered as the “border agent” between the direct and indirect communication with the company. This person will likely become the mediator between the personnel of the franchise and those employed directly by the school unit
- The stakeholders involved in the ECEC training activities are variable, and their roles are either flexible, shared or unclear. This is suggested by the mapping of three different actors with similar profiles:
 - o the (external) local training center,
 - o the (individual external) trainer, and
 - o the (internal) pedagogical expert

The second step was to map the relations between stakeholders and count their respective weights (i.e. number of times an equivalent relation was drawn between the same pair of stakeholders). The combined stakeholder map is shown in Figure 22. To facilitate its reading and interpretation, the stakeholders, their relations and weights are also available in tabular format in Appendix 3.

instruments, and physical and digital games. The company also partnered with educators from the University of Helsinki to align their materials to the Finnish ECEC curriculum including mathematics, science, music, language, arts and crafts, physical education and social interaction (Dredge, 2013).

Helsinki International Schools (HEI Schools) is a venture co-founded by various educational and design experts and the University of Helsinki, which is also a shareholder (Helsinki International Schools, 2017). It signed an initial agreement with the city of Baotou in China to establish a pilot day-care centre, scheduled to open in September 2017. This agreement includes the curriculum, teacher training and content distribution until the end of 2018, as well as the planning and advisory for the design of the ECEC environment. They established a cooperation network with the Beijing Normal University and Chinese Academy of Sciences (Peltonen, 2016). The pilot unit will have two rectors, one from China and the other from Finland, and five kindergarten teachers from Finland who will work side-to-side with their Chinese counterparts (Rusanen, 2017). The initial face-to-face intensive training for the Chinese educators was conducted between May and June of 2017 and is scheduled to continue through the 18 months that the Finnish staff will remain in Baotou, supported by continuous online training and materials (Rusanen, 2017).

Iglookids international is a preschool franchise with units first established in Pune (India) and partner centres in Finland. Their mission is to combine the Finnish ECEC curriculum and adjust it to comply with the requirements of each local market, with the help of experts based in Finland (Iglookids International, 2017). Their website also lists centres in India, Mozambique, Kenya and Singapore (Iglookids International, 2017).

KOULU group is another organization providing education solutions for kindergartens and K-12 schools, based on Finnish educational expertise (KOULU Group, 2017). Their website lists three main service categories: operation of private schools and teacher education institutes with local partners around the world, a training programme for K-12 and vocational education teachers, and various educational consultancy services grouped under the name of “school development framework”. The latter category includes activities such as educational tourism for students and educators, capability and opportunity assessment for schools, face-to-face certification programs and e-learning courses for educators (KOULU Group, 2017).

Leikki Group was listed as part of the xEdu accelerator batch of Spring 2017. In the official xEdu portfolio, it is presented as a productized day-care concept based on play methods and provided as a franchise (xEdu, 2017). The license includes the Finnish ECEC curriculum, personnel training, and information about play-based tools and methods. Besides the day-care franchise, they also offer ECEC educational services (i.e. contents and training), as well as advisory and equipment for ECEC environment design (Leikkigroup, 2017).

Besides the companies listed above, which provide their ECEC services directly to customers abroad, there are also examples of organizations acting as intermediaries in the sales and negotiation process. Such is the case of **Polar Partners**, a start-up based in Tampere which matches the specific needs of foreign organizations and individuals with any of the solutions provided by their partner firms (Talouselämä, 2017). Some of the service categories offered are: Management coaching, teacher training, pedagogical software, content and assessment, architecture and interior design, and individual student support (Polar Partners, 2017).

A comparison of the information presented in these companies’ websites, press releases and related news articles, denotes the following similarities with the case study company:

- All the alternatives listed above offer ECEC curriculum content solutions based on play methodologies, relying on the existing fame and reputation of the Finnish system (e.g. PISA results).
- Participatory pedagogy and phenomenon-based learning are mentioned less frequently, which may indicate that these concepts have less marketing appeal or less known abroad (e.g. phenomenon-based learning is a relatively new approach).
- Teacher training and professional development is another wide category identified, along with the also broad category of architecture and interior design for ECEC environment, which are usually not presented as the main offering but a complementary service.
- Sample contents or pricing information are not provided in any of the company websites, suggesting that this information is only available per request and/or depending on the negotiation terms.

4 Discussion

This chapter contains a critical analysis of the case study findings, compared whenever possible to the background literature and related research. The discussion is divided into two parts: The first one concerns the process and methodologies, while the second part addresses the concrete results. Both sections are approached from negative and positive perspectives, listing the challenges and limitations, followed by the opportunities and advantages. After explaining all the findings in the broader business context of Finnish ECEC services export, specific recommendations are provided for the adaptation of current supporting technologies and the design of new ICT-based solutions. The chapter concludes with some general reflections from the author.

4.1 Discussion on the case study process and methodologies

4.1.1 Challenges and weaknesses

One of the main challenges to gather the required information for this thesis was to assume a neutral perspective and continue to act objectively towards addressing the research objectives, without being influenced by the inner daily workings of the company examined in the case study. This added some difficulty to the process, for a couple of reasons: First, I had also to fulfil my daily duties as a normal employee, reducing the time available for this project and shifting often my focus of attention. Second, I had to be continuously aware that I was leading the process to design the “ideal solution” for *any* company that aims to provide the same services. This means that I had to identify and separate from the research process any elements that were too specific or tightly related to our current negotiations or ongoing operations, but at the same time I had to avoid retaining any key information that had been published, regardless of whether that same information could be used for the benefit of any potential competitor¹⁰.

In this aspect, I consider SD tools and methods can be applied more easily by external facilitators such as independent consultants, who begin with a clear “state of mind” regarding their knowledge of the customer, and who are not affected by any critical pieces of information or insights revealed throughout the process. Being at the same time researcher and employee of the company from the case study carries the additional risk of biasing the results, influenced by the previous interactions with co-workers, partners and customers. Even after procuring to maintain a neutral stance during the workshops, the participants were still my co-workers, who had to open themselves up and reveal information that could be sensitive for them or their peers. The pseudo-role of acting like a consultant within the same company is a double-edged sword: Participants may provide more details if they feel there is a trustworthy internal environment, but they can also refrain from giving key information because of existing assumptions about the potential reactions from other teammates. Furthermore, the existence of non-disclosure agreements, which forbid the release of any potentially strategic information for competitive purposes, may also affect the quality of feedback.

Another important setback from this study was the limited timeframe available to conduct the research process. ECEC services have a particularly long lifecycle, as they operate tied to the academic year calendar of each country or region, and can be affected by any updates of the national curricula and guidelines. Still, a detailed evaluation of any proposed technological solutions for the ECEC sector should have been conducted directly with the end-users (i.e. teachers, parents or heads of schools). To obtain a reasonably supported feedback, engagement should happen through observation and interaction across different stages of the customer’s journey, as well as with additional interviews thereafter, once the target users had the opportunity to reflect on their overall experiences. Unfortunately, the stages for collecting information from observation and interviews matched with the summer break holidays in Finland, when most organizations put their activities on standby, including the case study company¹¹. The literature review and writing of this thesis should have started as early

¹⁰ Any case-specific information has been reviewed beforehand by the company management and approved for release (per a signed agreement), with the best intention on the author’s side to provide a meaningful research contribution for the company itself and any other future practitioner.

¹¹ It was originally planned to include interviews with a representative of each company described in the Benchmarking stage of the case study (section 3.3.4), to obtain more information about their products and services. Written requests for a meeting were sent in advance, but these invitations were either declined or remained unanswered.

as January 2017 instead of May 2017, but separating the thesis-related tasks from any other tasks that did not contribute significantly to that same purpose proved to be a big practical challenge, as well as a motive of disagreement with the company management regarding my exact role and responsibilities as intern.

The delays in the research process were further motivated by the constant desire, shared by all the case company team members including myself, to sign a successful agreement that would allow us to test the school franchise concept and its supporting tech tools. In fact, the initial aim of this study was to conduct a UX assessment with the target users of an online platform outsourced by the case study company, with the purpose of supporting the teaching activities in Spain and Brazil. However, company negotiations did not materialize into a concrete implementation of the school franchise. As I realized these pilots were not going to take place within my required research timeframe, I had to switch significantly the focus of the thesis and depend less on the company as a core contributor to the research process. Instead of obtaining key information from the company's customers, the company would become the customer itself.

This resulted naturally in a lack of continuous involvement and timely feedback by the other team members, who still had to deal with the urgency of sealing important business deals that could assure the financial stability of the company, while attending separately any additional requirements for this thesis research. Naturally, this sort of "consultancy services" was less attractive for both the company leadership and myself, highlighting the challenge of keeping a balance between the thoroughness of a formal academic research process and the continuously changing dynamics of the start-up environment. To put it into simple words, it is like attempting to take a photo of a fast-moving target that can disappear from the frame anytime.

Along with the timeframe, the research process was also hindered due to budgetary reasons, such as the lack of dedicated funding from the company or universities recipient of this study. The observations and workshops were carried out as part of the author's daily work activities, so all collected feedback has the limited scope of an "external consultant" acting within the company itself. Additional funds are necessary to organize more complex experiments and thorough testing sessions, which allow to gather insights from teachers or heads of school, as well as to reach parents and collect their feedback about the proposed solutions for their children's education and care. The perspective from parents and educational staff in the provision of ECEC, a topic which has not been deeply examined in the thesis, provides an interesting angle for future research.

Finally, the academic framework, research results and conclusions provided may well also reflect an outdated picture by the time this thesis is released to the public. It should not be assumed that the technological gaps described in this research are still present, or that any proposed solutions have yet to be implemented. The services industry is constantly challenging itself by innovating and providing new software solutions that streamline and adjust their offer to fast-changing customer needs. For this reason, any future practitioner or researcher should be aware that this thesis represents the state of ECEC services export during the first half of 2017, and even though the methodological framework and its results constitute a valuable reference for future academic and industry work, it will also result unavoidable to adjust and update them to reflect any advancements in the ever-changing ecosystem they represent.

4.1.2 Strengths and opportunities

On the positive side of things, the chosen methodologies for this thesis allowed me to gain a deeper understanding of the practical business aspects that I would not have fully grasped as an academic researcher. While performing my duties as Business Development Associate, I was in direct contact with the company staff and external stakeholders, acting as intermediary between them and trying to bridge any potential communication gaps, such as the ones derived from the culture differences between Finland and the target markets, or the customers' understanding about the services offered by the company.

The market research and conversations with potential partners and customers provided a solid base to identify most of the operational challenges behind the ECEC education export activities. I could contrast the expectations and requirements of these key contacts with the development status of our own products, so the recommendations for the adjustment of current products and the development of new ones are based on actual stakeholder feedback.

Another important advantage was the creative freedom given by my company boss and advisor to explore different issues to address during the research process. I experienced no constraints or limitations in terms of the topics to propose, the data collection methods to choose, or the content structure of the thesis. Naturally, the freedom demands more individual responsibility and self-organization. Without these two elements and with limited guidance there was a higher risk of losing the focus, but at the end this also allowed me to move forward with the process without any bureaucratic bottlenecks.

The SD workshops proved to be a useful method to engage all the company members into the analysis of complex topics without resorting to unnecessary technical discussions. They allowed to address the proposed situations with an open mindset, generate fresh ideas on the types of technology solutions that could be designed, understanding for whom and how. The visual elements and other SD tools facilitated the creativity of the participants in an entertaining way, improving the quality of the feedback and expanding the discussion into new areas that were previously not considered.

4.2 Discussion on the case study results

4.2.1 Challenges and weaknesses

4.2.1.1 Dynamics of the Finnish ECEC export industry

The case study provided the opportunity to support some of the existing background research in terms of ECEC export business dynamics. For instance, the workshop activities conducted to study the company's stakeholders highlighted the need to work in collaborative networks of entities, both public and privately funded, to enable the export of the Finnish ECEC services. This goes in line with the findings described in El Cheikh's research, and matching closely his list of actors and main assets of Finnish education export process (see 2.2.2 above). The interactions with the members of the case study company also suggest a problematic that persists in Finland: Many players still operate in silos. Organizations such as the one described in the case study possess the necessary knowledge of the target markets and customers, and have even productized sufficiently the service offerings according to the needs of those customers, but lack the necessary funding to leverage these various skills and capacities, by creating for instance their own in-house development team or hiring full-time employees to improve their sales efforts.

As described in the existing literature and as evidenced by the testimonials collected from the case study, personal chemistry still plays an important role in the decision-making process to establish partnerships and to successfully close business deals. The lack of strategic connections can represent a persistent barrier for smaller companies who may be excluded from the "circles of trust" of government-sponsored event participants, incubator and accelerator alumni, or academic research communities. In the long term, this may harm the entire network, as actors may be perceived to act separately competing against each other instead of collaborating, by preventing newcomers from bringing fresh proposals to innovate on services with improved business strategies. An example of this competitive rather than collaborative attitude was observed when the company got news that one of their business partners was looking for alternatives of Finnish ECEC franchises and getting in contact with competitors behind the scenes. A similar scenario of competitive disadvantage occurs when one single company gets the exclusivity to present in "educational, non-for-profit" events co-sponsored by public agencies, which aim for the same target market as the rest of the organizations participating in the sector.

This thesis has mostly addressed the topic of Finnish ECEC export from the perspective of the private sector, where the case study company or any of the benchmarked alternatives belong to. For these entities that aim to commercialize Finnish education, Finland itself could become one of the main competitors in the next couple of years. As indicated in the literature review chapter (see 2.2.1 above), there are already proposals to centralize the marketing, promotion and financing of education export under the same country brand, administered by one or various public agencies. If these initiatives move forward, a state monopoly could arise in the form of government vetting, exclusivity licensing or any similar deals. For instance, the official agency could decide to grant its "seal of approval" only to specific ECEC service providers, as a proof for foreign parties that they are the only ones backed-up by the national authorities in Finland. The government itself could also decide to venture into exporting ECEC services, by establishing public-private or simply publicly-funded ventures.

Giving their easy access to capital and the strategic contacts in government and academia, any of these initiatives could threaten the existence of smaller start-ups aiming to go international.

4.2.1.2 *Trade-offs between revenue and early testing*

To mitigate the risks of falling into an exclusion scenario such as the ones described in the previous point, companies dedicated to the ECEC services export (and education export in general) should define concrete actions to maintain visibility and gain relevance among their competitors, their potential customers abroad and their key partners in Finland, such as educational researchers and government officers. As Kempainen wisely summarized in her thesis title, education export is a *reputation-driven activity*, after all. Therefore, in addition to delivering their main service offerings, companies require other types of initiatives that do not result in direct revenue gains, but which are necessary to generate awareness and trust in their professional expertise. Some examples of these “*pro bono*” activities could be the organization of webinars, face-to-face workshops or training sessions for parents and educators, the sponsorship of educational visits and conferences, or the participation in education export and EdTech trade fairs. Allowing to use their apps and platforms on a *freemium* model – or a free trial period – will also help any interested parties to learn about the company and the technological solutions it provides.

These compromises in terms of revenue flows may be compensated by having the opportunity to test early the products and adjust them based on real customer feedback. Under a services approach, there is inherent value in transitioning from pure operational and financial decision-making into a more customer-centric strategic planning, as it has been stated before in the foundational principles of S-D logic (see Table 5 above), particularly FP7 (“*The enterprise cannot deliver value, but only set up the environment to offer their applied resources as value propositions*”), FP6 (“*...the value occurs as result from the interactions between the customer and the service delivery system*”) and FP8 (“*...is the customer who accepts the value proposition and determines its benefit*”). In summary, without early and frequent customer engagement, even a highly-developed product-service offering can fail.

Participants in the ECEC export sector could also benefit from selecting and specializing in just enough services so they can procure a Minimum Viable Product (MVP) that can be tested and improved iteratively. This can help reduce the vagueness of the offerings in the market, especially if the concrete “product” to sell is unknown, has not been sufficiently developed yet, or requires a different innovation ecosystem configuration, as suggested by the official education export strategies of the Finnish government. Any offerings will require a continuous inflow of ideas, both from internal and external stakeholders, to innovate and make the model more scalable while keeping consistency with the Finnish national guidelines and the compatibility with the local educational contexts.

4.2.1.3 *Technology design and usage*

The case study observations suggest that the educators’ lack of technological expertise is a frequent entry barrier for potential ECEC service solutions, irrespective of the target market selected. The pedagogical experts from the company, as well as their external counterparts during the negotiation process, often voiced their doubts about possessing the required skills to handle any hardware and software components that could be proposed to automatize or facilitate their most common routines, such as accessing daily activity instructions or evaluating the learning process of the kids. During the workshop sessions, it was also difficult to connect the scope of pedagogical design with technological design, as the professionals in the first field were unfamiliar to the practitioner’s language of the latter. This lowered the original expectations in terms of results, as more time had to be invested in explaining basic concepts required to obtain more detailed feedback.

Even though the ways of incorporating technological tools and devices to class are still a bit unclear, ECEC professionals recognize that it plays an important role, not only as a supporting tool for their daily tasks, but also as a necessary device to teach children that they live in a digitally interconnected world. For instance, the results of Workshop 1 (see 3.3.2.2 above), show high expectations about the potential of technology in terms of educational support. After Workshop 2, there was also an open discussion about the opportunities for young children to grow familiar with technological devices and to learn the implications of their pervasiveness, by simply observing how these devices are part of the daily class activities and used by their teachers effortlessly.

The need of a clear strategy to incorporate technology and blend it in a naturally into the teaching workflow poses organizational and technical challenges for service designers and technology providers alike. Some of these represent interesting questions to address in future projects, such as:

- How to make a solution both easy to learn and easy to use, for users with limited technological skills?
- How to expand the teachers' vision about the benefits of technology in their daily routines?
- How to avoid an excessive dependency of the teachers on these technological solutions, creating opportunities for their own creativity and experimentation?
- What are the best mechanisms to gather educators' feedback and integrate it into the change management process of the designed technologies?

The observation of rehearsal sessions within the case study company also allowed to identify the challenge of maintaining a homogeneous training process for ECEC teachers, regardless of people and locations involved. Since the materials are not elaborated by the trainers themselves but by the "product team", the person giving the face-to-face lectures could experience difficulties to familiarize herself with the contents, or these may not match her teaching styles. Two of the foundational principles of S-D logic, co-creation between provider and consumer (FP6) and value-in-use rather than value-in-exchange (FP3), can be distinguished in the initial training process and the subsequent remote assignments, because the professional development of teacher skills is a service where production and consumption cannot be entirely separated. This opens further challenge questions for service designers and technology providers:

- How to translate the baseline of required teacher competences and skills into something tangible?
- How easy is it for new trainers to assimilate the contents, give them flexibility but at the same time guarantee that standards are followed?
- How to enable feedback and participation from trainers to make updates to the slides, manuals and documentation?
- How to keep track of the updates and versioning of the materials so they can still be easily distributed to the different locations and staff around the world?

4.2.1.4 Sales process and customer-value fit

In terms of the sales and negotiation process, one of the difficulties observed during the case study was the concern of the external counterparts to adjust the Finnish curriculum contents and comply fully with the guidelines and regulations of the local education systems abroad. This conducted to intense discussions within the company on the proper terminology that should be used, finding words that could reflect the right balance between the standardization of Finnish methodologies and the flexibility to integrate the educational policies, culture and traditions of each target market. Terms such as integration, adaptation and combination may be perceived differently by different partners and customers. This could result in both sides of the negotiation process pursuing contradictory goals. For instance, even if potential partners and customers abroad search actively for ways to import the Finnish education system and gain an edge on their competitors, at the same time they could be hesitant about the fit between the Finnish methodologies, curriculum and learning objectives with their national counterparts.

Partially because of this paradoxical situation, but also as a standalone challenge by itself, potential partners or customers may demand frequently to see some proof-of-concept of the franchise solution implemented successfully and running in a similar setting as theirs. This lack of tangible evidence was perhaps the biggest disadvantage for the case study company and was often regarded by the team as "the chicken and egg problem", since it was impossible to obtain such proof-of-concept if none of the potential leads wanted to take the first step and do it themselves. Despite every single contact being informed about the good reputation of the Finnish ECEC model and convinced about its quality, the scepticism about whether this model could work on different local realities was greater than the perceived benefits of the investment, so no party wanted to assume the risks of a failed trial.

Based on this problematic, it may be inferred that the value proposition was not being communicated clearly enough to convince the potential school operators to invest on a long-term commitment with the franchise. This limitation could be addressed by adopting the productization strategies proposed by (Jaakkola, 2011) and

described in the background research review (see 2.3.6.5 above), specially number 2 (“Tangibilizing and concretizing the service offering and professional expertise”), which reduces the perceived risk of acquiring the service due to its traditional abstract nature and the lack of evidence.

4.2.1.5 *Recognizing the true strategic value of Finnish ECEC export*

Finnish ECEC export activities depend on the intangible assets represented by the pedagogical methodologies, curriculum and learning goals of the national education system, but all this information could be copied, improved or updated by any party as soon as it is released to the public (e.g. through an official government report, academic publication, or even this thesis itself). As more options become available in terms of Finnish ECEC franchises, Finnish EdTech or simply for bringing Finnish expertise to other countries, educational service providers should also be aware that the promise of Finnish quality education could gradually lose its value as a key differentiator and start to be perceived abroad more as a commodity. In the mid- to long-term, as the education export industry becomes more mature, the concrete evidences of successful implementations across various cultures, realities and contexts may become the key competitive advantage between multiple ECEC providers. This highlights once again the importance of building a strong reputation, both home and abroad, as another key intangible asset in addition to the pedagogical products and contents.

Finally, the case study suggests that the ability of partners and customers to understand the value proposition and gain trust on the service providers depends greatly on achieving an optimal balance between standardization and flexibility of the service artefacts, as well as on the generation of high-quality tangible evidences along the service delivery process. These results can be observed in the quality of the teacher assessments or through the child reports sent to parents. The training materials for educational staff, the daily class instructions, the curriculum learning goals or the guidelines for the design of ECEC environment are also examples of documentation that needs to be properly organized, formatted and standardized in such a way that can be re-distributed, re-used and adapted whenever needed. Document Management and Version Control Systems are just a few tools that could help organize the access and control the change workflow of these key artefacts, to materialize the know-how assets of the company and persuade customers that they are getting good value in exchange for their money.

4.2.2 Strengths and opportunities

4.2.2.1 *Uncontested market space*

Existing research on the export of Finnish education services indicates that the industry is still at an early stage, as the latest policies and strategies to structure a coherent innovation ecosystem around public and private collaboration is yet to be implemented (see 2.2.1 above). However, this also represents a timely opportunity for current service providers to develop a “blue ocean”¹² strategy for uncontested market space and overcome their current limitations.

The case study company, for instance, appears to be severely hindered by the current business model, as the ECEC package components are not sold separately. Should they decide to switch their current role of ECEC franchise sellers and promote themselves instead as Finnish ECEC specialists, they could offer a wider portfolio of products and services, take part in public biddings, social impact accelerator programs, or sell their services directly to government entities and NGO’s carrying out educational projects abroad.

Public-private networks should be also leveraged to reach the target users faster. Pedagogical researchers and school staff would benefit from testing early the software solutions inside the classroom, providing feedback in a continuous and automated manner. This may reduce the time it takes to evaluate the success of the pedagogical methodologies or approaches. Providers, on the other hand, would benefit from real user feedback to validate and adjust their software.

¹² The term “blue ocean” denotes the strategy of creating demand for an industry which does not exist yet. Most blue oceans are created when the boundaries of the existing “red ocean” industries are expanded by means of value innovation. In blue oceans, competition is not relevant because the rules of the game are still undefined. (Kim & Mauborgne, 2005)

4.2.2.2 Technology solutions to improve productization

To develop effective PSS that summarize and reflect the expertise in the ECEC export, the case study company should move beyond the elaboration of nice-looking presentation slides and start to document, manage and integrate through information systems the various perspectives and disciplines of their company specialists, as well as from the interaction with other entities involved in the sales process. For instance, among the key external key actors identified during the first workshop were the outsourced technology provider and the partner for the architecture and interior design aspects of ECEC environments (see 3.3.2.2 above). These entities would benefit from a more direct communication and better access to information about the own customers of the case study company through shared information systems.

Other key stakeholders with stronger financial interests in companies like the one addressed in the case study, such as the government, angel investors or venture capitalists, would benefit greatly from online platforms that provide them all the information about the current situation of the companies operating in the ECEC export network, their type of offerings and their target markets. This would give them a clear overview of any potential opportunities for impact investment, or the opportunity to track the status of key milestones in the companies which they have already funded.

Technology could also be used to bridge the communication gap between Finland and the growth markets, by implementing and deploying CRM tools that enable to follow-up the sales workflow of each potential lead, partner or customer, sharing easily with them any key franchise documentation or contractual agreements.

In terms of daily school operations, the efficient use of information systems for the design, distribution and assimilation of pedagogical material can help achieve a higher scalability in the franchise business model proposed by the case study company. For instance, the cost of deploying each new school unit abroad can be reduced by centralizing the design of ECEC contents and distributing them remotely, supported through online platforms for teacher training and continuous professional development. Automatic reporting features will be also fundamental for the company to determine if all their franchise branches are effectively aligning to the same standards.

4.2.2.3 Splitting the service offering

The experiences from the case study reflect that in many cases, selling separate products instead of the entire franchise offer represents a more reasonable approach to enter the foreign markets. Even if the promise of a “school-in-a-box” – or all-inclusive solution – may have the initial appeal to raise the interest of potential new customers, selling the complete package is a task that carries too many cultural, logistical, commercial and operational hardships. For instance, as the sales and negotiation process advanced, it became evident that not all the customers valued the “completeness” of the solution, as they demanded more freedom to honour their local contexts and realities. Some of them just wanted an easy deployment with less entry barriers, which allowed them to differentiate from their current competitors (i.e. having exclusivity over the “Finnish seal of quality”).

For these reasons, a key productization strategy to facilitate the design of technological solutions listed in the previous sub-section and enable new business opportunities is to split the service offering. Different potential customers have very specific needs that can be fulfilled by just one or a handful of the franchise elements, and therefore the investment in the complete franchise package seems excessive to them. The following sub-sections illustrate two ways of dividing and understanding the Finnish ECEC franchise offer. The first one presents the service delivery process in terms of the elements are visible or not to the customer, while the second separates the service offering into various relevance levels and their dependencies. These graphs do not aim to be an exhaustive compilation of all the potential service offerings and combinations, but to illustrate a reasoned approach to divide them.

4.2.2.4 Delivery process of the Finnish ECEC services

Figure 23 shows the separation between front-office (front stage) and back-office (back stage) of the ECEC services. The model by (Koivisto, 2009) and (Grönroos, 2000) has been taken as a base to rationalize which elements are directly visible to the customers identified during the case study and which ones are hidden but still required to support the delivery process.

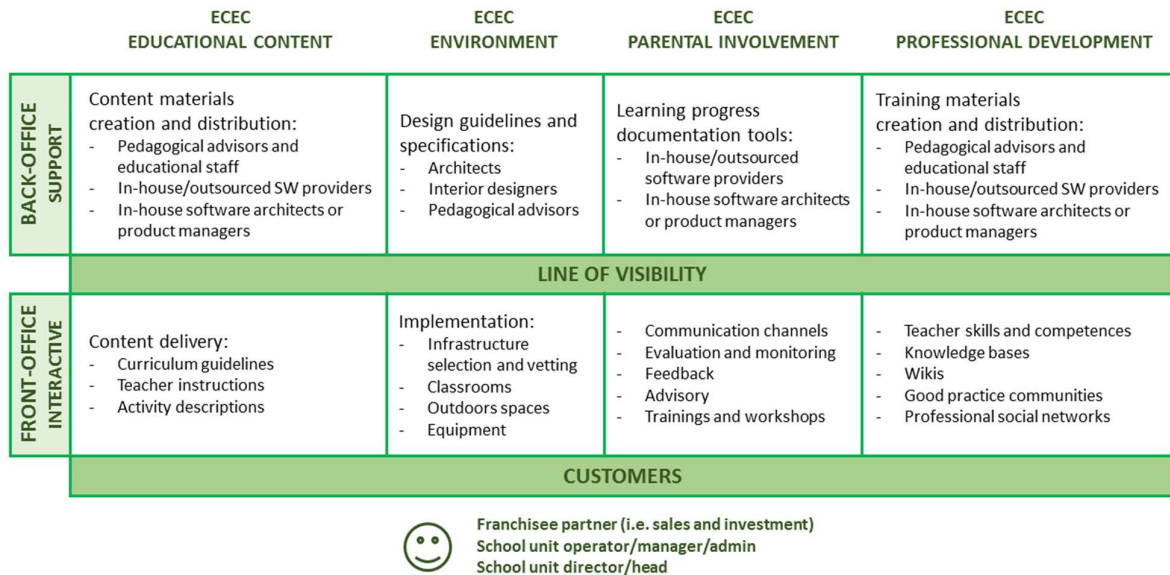


Figure 23: Front-end and back-end of Finnish ECEC services

Since the EduCare model for Finnish ECEC addresses not only the educational aspect, but also the overall wellbeing and environmental context where children can actively develop themselves, both front- and back-stage activities have been clustered by their element of concern inside this holistic approach. In the figure, four categories have been established: The educational contents (i.e. curriculum, learning goals, activity descriptions and teacher instructions), the ECEC environment, the parental involvement and the professional development. Further categories may be added to expand and increase the level of detail in the services provision.

In every case, the back-end activities are mostly related to materializing the existing know-how and transforming it into tangible artefacts that enable the standardization, replication, distribution and scalability of the services. This can also be aligned with the model by (Kemppainen, 2016) described previously in section 2.2.3 above. Even though her model focuses only in the education aspect (the first column of the four detailed in the figure), it is still consistent with the premise that ECEC back-stage processes deal mostly with the design of hard services, with a lower grade of intangibility and inseparability. In other words, the technological solutions that may be implemented at the back-end allow to make ECEC services more tangible and separate their production and consumption, mainly by means of their documentation and later review: The ECEC curriculum, methodologies and activities can be documented and uploaded to an Learning Content Management platforms, the specifications and guidelines for ECEC design can be translated into architecture and interior design manuals, the engagement of the parents into the learning process of their children can be achieved by communication and monitoring tools, and the professional development of educators requires the elaboration and distribution of training materials.

On the other hand, the front stage is the interactive part of the services facing the customers directly. These customers are not the same as the end-users of technology, but the ones who are in fact paying to acquire the Finnish ECEC franchise license. They are concerned in obtaining some proof of the delivery and quality of the services, which can be considered both an abstract and subjective goal. Therefore, this is also consistent with the definition of a layer of soft services with higher intangibility and inseparability. The extent to which these evidences can be materialized and separated from their “production/consumption” moment varies. For instance, the design of the ECEC environment can become quite tangible, at least inside the classroom or around the school, by looking at the infrastructure and equipment, but it still can be fully experienced only by the children while they go to the day-care. The professional development of teachers can also be evidenced through their participation in social networks and online communities, or by their contributions to wikis and use of knowledge bases, but it is not certain that these documented teacher skills and competences will be

effectively applied during class. Same thing applies to the actual educational content, which may be stored and available in the Learning Content Management systems, but without guarantee of its actual application. When it comes to parental involvement, there is a higher level of separability because the communications and interactions between educational staff and parents may take place in different moments.

4.2.2.5 *Finnish ECEC franchise package*

While the previous sub-section gives an insight on how ECEC service providers can structure their delivery activities, Figure 24 below shows how these services can be offered, marketed and sold to customers. This proposal has been also elaborated upon the model of service package by (Koivisto, 2009) and (Grönroos, 2000), which establishes different hierarchies between the services that constitute the minimum core offering that must be always provided, those services that cannot be separated from the main offering, and those ones which are optional but enrich the whole customer experience by adding fidelity and differentiation.

THE BASIC SERVICE PACKAGE ECEC from Finland		
THE CORE SERVICE ECEC content creation curriculum by age groups - Nursery - Kinder 1 - Kinder 2 - Pre-school 1 - Pre-school 2	SUPPLEMENTARY SERVICES Facilitation of ECEC content delivery	
	FACILITATING SERVICES - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA	SUPPORTING SERVICES - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance

Figure 24: Service outcomes of the Finnish ECEC franchise package

In the export of ECEC it is also possible to observe these hierarchical levels among the various services involved. The core product is constituted by the set of pedagogical contents, methodologies, learning goals, activity descriptions and teacher instructions that carry the essence of the Finnish ECEC curriculum. This can be divided according to age-based groups for easier mapping to the national education system of each target market country or region. A further division can be done depending on the number of hours that kids will spend in the ECEC centre (i.e. full-time or part-time). In the model of (Thoben, Eschenbächer, & Jagdev, 2001), this would represent the minimum product in a narrow sense that can be offered to customers, which can be translated into tangible entities such as documents, as described in the previous sub-section.

The core ECEC contents depend on certain facilitating services to set the minimum conditions in terms of educator skills and operational environment. These activities, such as the initial teachers’ training or the integration of Finnish and foreign curriculums are less tangible and thus, also more difficult to explain and sell to customers. However, at the same time they cannot be separated from the core offering of ECEC contents because otherwise they would lose their value or become inapplicable.

The last category belongs to the supporting services that can be offered as add-ons to the main package acquired by the franchisee. These are optional activities which may be performed anytime during the school year by customer request. In the broader context of ECEC export (i.e. not tied to a franchise business model), these services could be offered independently from the main product as ad-hoc “professional pedagogical advisory”. As illustrated in the three examples of Figure 25, the strategic combination of core, facilitating and supporting services, will allow to diversify the offerings and their price levels, making them more attractive and adaptable to the specific needs and requirements of each customer. These could be branded, for instance, as “basic”, “full” and “custom” ECEC packages.

THE BASIC SERVICE PACKAGE ECEC from Finland						
THE CORE SERVICE ECEC content creation curriculum by age groups <ul style="list-style-type: none"> - Nursery - Kinder 1 - Kinder 2 - Pre-school 1 - Pre-school 2 	SUPPLEMENTARY SERVICES Facilitation of ECEC content delivery <table border="1"> <thead> <tr> <th>FACILITATING SERVICES</th> <th>SUPPORTING SERVICES</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA </td> <td> <ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance </td> </tr> </tbody> </table>		FACILITATING SERVICES	SUPPORTING SERVICES	<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance
FACILITATING SERVICES	SUPPORTING SERVICES					
<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance 					

THE BASIC SERVICE PACKAGE ECEC from Finland						
THE CORE SERVICE ECEC content creation curriculum by age groups <ul style="list-style-type: none"> - Nursery - Kinder 1 - Kinder 2 - Pre-school 1 - Pre-school 2 	SUPPLEMENTARY SERVICES Facilitation of ECEC content delivery <table border="1"> <thead> <tr> <th>FACILITATING SERVICES</th> <th>SUPPORTING SERVICES</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA </td> <td> <ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance </td> </tr> </tbody> </table>		FACILITATING SERVICES	SUPPORTING SERVICES	<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance
FACILITATING SERVICES	SUPPORTING SERVICES					
<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance 					

THE BASIC SERVICE PACKAGE ECEC from Finland						
THE CORE SERVICE ECEC content creation curriculum by age groups <ul style="list-style-type: none"> - Nursery - Kinder 1 - Kinder 2 - Pre-school 1 - Pre-school 2 	SUPPLEMENTARY SERVICES Facilitation of ECEC content delivery <table border="1"> <thead> <tr> <th>FACILITATING SERVICES</th> <th>SUPPORTING SERVICES</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA </td> <td> <ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance </td> </tr> </tbody> </table>		FACILITATING SERVICES	SUPPORTING SERVICES	<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance
FACILITATING SERVICES	SUPPORTING SERVICES					
<ul style="list-style-type: none"> - Teacher training - Basic ECEC environment setup - Integration of Finnish and foreign ECEC curricula - Pedagogical monitoring, feedback and QA 	<ul style="list-style-type: none"> - Custom-created content - Advanced ECEC environment design - Thematic workshops for educational staff - Ad-hoc professional advisory - Parental training and guidance 					

Figure 25: Sample packages of ECEC services: Basic, full and custom

4.3 Recommendations

Based on the broader discussion of the current business landscape for productizing and exporting Finnish ECEC services, this section aims to provide recommendations mainly directed at the case study company, but which can also be applied by other interested parties. These proposals are focused on the adaptation the existing PSS and the design of new solutions supported by ICT to improve the productization/servitization strategies and the competitive landscape in general.

4.3.1 Changes and improvements on current products and services

The first recommendation aims to address some of the aspects identified during the case study, suggesting that the company should move into a more customer-centric approach to develop their business strategy and design their product-service offering. For instance, the stakeholder map elaborated during the second workshop listed students as flows of resources rather than actors (see 3.3.3.2 above). This finding aligns with the results of the first workshop, as students were also missing from the categories of “customers” or “tech users” (see 3.3.2.2 above). Even though the company products are not meant to be used by the children directly, their perspectives and points of view may influence their parents’ opinion about the services and indirectly, the operators’ opinion about the franchise.

From the observations during the working period in the company, it may be inferred that some customers can get overwhelmed by the complexity of the franchise negotiations. Thus, the transition into a more customer-centric approach could also be supported by splitting the current “preschool-in-a-box” franchise package into more flexible offerings that can be adjusted to needs and budget of each potential customer (see 4.2.2.5) and thus, allowing to sell the ECEC curriculum contents separately, or with the minimum integration of teacher trainings and ECEC environment advisory services required to enable its functioning.

A further recommendation for the case study company is to optimize of resources invested in the translation of pedagogical contents, presentations and application features. These platforms, apps or contents should not be localised too fast, or at least not before reaching stage 5 of the selling process of education exports (see Figure 4). Otherwise, the risk of a failed negotiation and pricing could turn the investments in product development into sunken costs.

The entire selling process should be translated into smaller cycles or iterations, involving key features of the entire service package, so the deployment into the foreign market can be done as gradually as possible. For instance, instead of giving full access to the platforms and apps, only the necessary functions could be enabled initially for teachers and parents. Similarly, only the contents that will be used during the first school period could be distributed through these channels. In this way, the company will still be able to provide an adequate level of services and at the same time have an MVP which can be tested early. This will allow to focus on creating a better customer-value fit and will also help the financial situation. Of course, this recommendation should be discussed and clarified with the local operators, especially if they aim to see all the contents or test all the functions of the platform and apps in advance, before the start of the school year.

4.3.2 New PSS supported by ICT

Besides the change recommendations above, this sub-section aims to propose new solutions based on more effective combinations of products and services. The framework by (Kuijken, Gemser, & Wijnberg, 2017) has

been used to distribute the various ECEC franchise elements identified during the case study and discussed above. The 2x2 matrix is a useful method to split the complexity of the “preschool-in-a-box” package into standalone products and services that can be sold and supported by ICT. The three principles of effective PSS (see 2.3.6.5 above) have been observed to distribute the ECEC franchise contents and operations:

1. The product or service elements should have sufficient autonomous value to be sold separately
2. The combination of the separate offerings should create synergy
3. Each one of the offerings should come from a different quadrant of the 2x2 matrix

Furthermore, by comparing the PSS matrix with the model of education as a service proposed by (Kemppainen, 2016), it can also be inferred that the back- and front- stage match the two quadrants representing the “hard services” (quadrant 1) and “soft services” (quadrant 4), respectively. The resulting combination of these frameworks is shown in Figure 26.

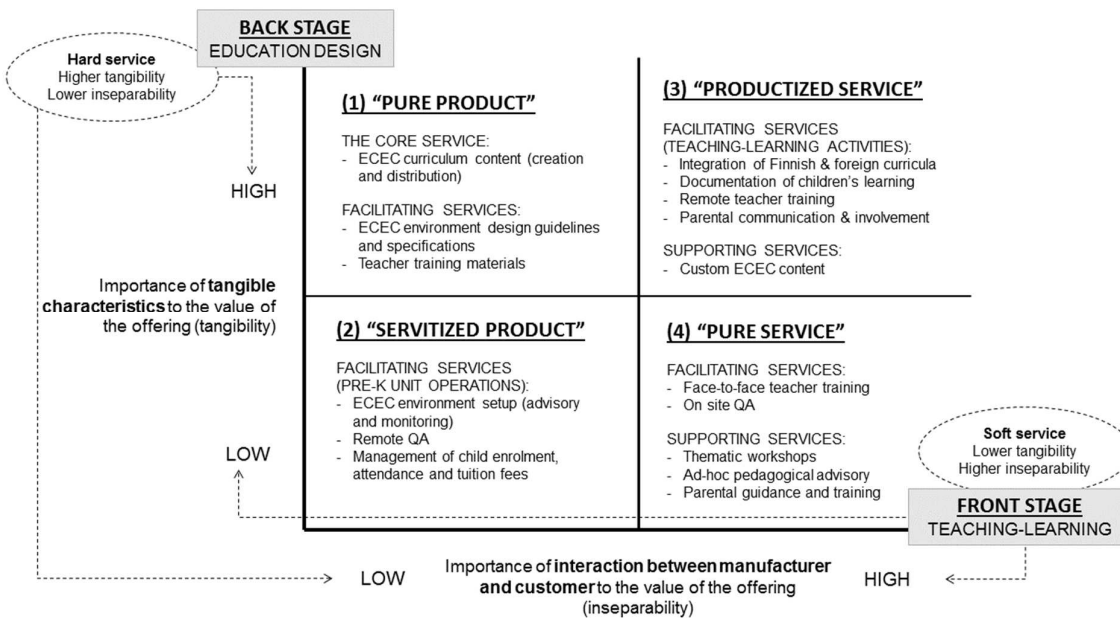


Figure 26: Combined PSS framework for Finnish ECEC

The matrix above should not be interpreted as the exhaustive list of elements needed to operate the Finnish ECEC unit, as it merely provides some examples to distribute the current franchise offering. This separation of components depending on their closeness to the traditional definition of “product” or “service” facilitates the ideation of various solutions for each quadrant, aiming for a more effective PSS altogether. It should be noted, however, that even this reasoned approach for technology design may face some practical restrictions: As discussed in the previous sections, ICT solutions may improve significantly the productization of hard services (e.g. education design), but have limited potential when it comes to soft services (e.g. face-to-face teaching learning).

From the author’s perspective and based on the information collected throughout the case study and discussion from this chapter, a list of proposed solutions that could be implemented in each quadrant of the 2x2 PSS matrix is provided in Table 9.

Quadrant	Offering	Proposed ICT solution(s) for productization/servitization
Pure product	ECEC curriculum content creation	DMS with change management, language and version control
	ECEC environment design guidelines and specifications	

Quadrant	Offering	Proposed ICT solution(s) for productization/servitization
	Teacher training materials	
	Delivery of ECEC curriculum content	Online platform to create and access contents in real-time
		Offline contents creation, access and distribution (e.g. through CDs or USB drives for areas w/ low connectivity)
	Content protection (i.e. DRM) solutions to avoid unauthorized copying and distribution	
Servitized product	ECEC environment setup (advisory and monitoring)	CRM tools for franchisor and partner operators/franchisees
	Remote QA	Automated school unit reporting, based on configurable metrics/KPIs <ul style="list-style-type: none"> - Operational - Pedagogical
	Management of child enrolment, attendance and tuition fees	Web platform with module to register and track student status
Productized service	Integration of Finnish and foreign curricula	Content editor with mapping and comparison features (e.g. "side-by-side", drag-and-drop matching of learning orientations and goals)
		Calendar of relevant local holidays and festivities
	Documentation of children's learning	Mobile or tablet application to take photos and document child activities in class
		Mobile or table application to assist the teacher in following the five daily stages of the learning cycle (i.e. time tracker, learning goal monitoring, real-time tips to setup the classroom for guided and free-play activities)
	Remote teacher training	E-learning platform: <ul style="list-style-type: none"> - Pre-recorded lessons - Webinars
		Online community / Professional network: <ul style="list-style-type: none"> - Discussion forums - Knowledge bases - Wikis
Parental communication and involvement	Web platform or mobile application for parents <ul style="list-style-type: none"> - Messaging chat (unidirectional or bidirectional) - Scan & send child art pieces - Submit learning reports - Submit notifications - Events calendar 	
Pure service	Face-to-face teacher trainings	Audio-visual support materials
	On site QA	School unit QA software <ul style="list-style-type: none"> - Standardized / configurable control checklists - Automated and centralized reporting
	Thematic workshops	Pre- & post-workshop feedback forms

Table 9: Proposed ICT solutions for the productization and servitization of Finnish ECEC

The list above can be used by the case study company as a starting point to improve the productization and servitization strategies, based on supporting information systems, web platforms, mobile applications and other types of ICT tools. In addition to these ideas, which could be developed and refined further, the discipline of SD (and some other related approaches such as Design Thinking) provides various techniques that could be used to involve the company team members in the brainstorming and ideation of further solutions.

Another important factor to consider is that any proposed solutions may differ considerably in the amount of resources – either financial or human – required for their implementation. As discussed in previous sections, given the current financial and operational situation of the company, the priority should be to procure an MVP that allows to gather early feedback, validate the concept, and maintain relevance and visibility among potential customers, partners and other actors of the education export ecosystem in Finland.

For this reason, the next recommended step would be to identify which features of the proposed solutions can be covered by existing off-the-shelf solutions, such as the one already outsourced by the case study company to the software provider in Singapore, and which ones require a dedicated in-house development team. Such task should be carried out by the case study company as part of their own tech strategy plans, as this study lists potential ICT solutions that can be used by any other Finnish ECEC export providers as well. Based on the author’s own experience while working in the case study company, an example of the comparative analysis between the current outsourced platform and other software products readily available in the market is provided in Table 10. The cases where an in-house solution is recommended or required are consistent with the key activities listed in Workshop 1, where technology was deemed as a high-impact factor for the company.

Proposed solution	Available off-the-shelf		In-house development	
	Current	Other providers	Recommended	Needed
DMS with change management, language and version control		(e.g. Alfresco, Nuxeo, KnowledgeTree, LogicalDOC, OpenKM)		
Online platform to create and access contents in real-time	X		X	
Offline contents creation		(e.g. LibreOffice, Microsoft Office, Scribus)		
Offline contents access and distribution		(e.g. Adobe Digital Editions, Kindle, iBooks)		
Content protection (i.e. DRM) solutions to avoid unauthorized copying and distribution		(e.g. EditionGuard, FileOpen, HoGo, Link Data Security)		
CRM tools for franchisor and partner operators/franchisees		(e.g. SugarCRM, Salesforce, Salesflare)		
Automated school unit reporting, based on configurable metrics/KPIs	(Limited)		X	
Web platform with module to register and track student status	X			
Content editor with mapping and comparison of learning goals				X
Calendar of relevant local holidays and festivities	X			
Mobile or tablet application to take photos and document child activities in class	X		X	
Mobile or table application to assist the teacher in following the five daily stages of the learning cycle				X
E-learning platform		(e.g. Moodle, Docebo, Litmos)		
Online community / Professional network		(e.g. Workplace by Facebook, Cornerstone)		
Web platform or mobile application for parents	(Limited)	(e.g. TinyApp, Qoqolo Student)		
Audio-visual support materials				X
School unit QA software	(Limited)		X	
Pre- & post-workshop feedback forms		(e.g. Google Forms, Typeform, SurveyMonkey)		

Table 10: Comparison between off-the-shelf and in-house solutions

4.4 Possibilities for future research

The extensive discussion in this thesis chapter is merely the starting point to understand the productization of Finnish ECEC services. Based on the need for dedicated academic literature, the experiences from the case study and the proposed ICT solutions, several new areas could be examined in future research projects. Some of them are listed below:

- Usability/UX assessment of the technological tools for the teaching-learning process and parental involvement of Finnish ECEC in the foreign markets
- Development of platforms to connect the different actors of the education export network, both in Finland and abroad, or to track the financing needs and provision of other necessary resources (e.g. materials and equipment for ECEC environment)
- Streamlining the sales workflow of ECEC exports with CRM and DMS solutions
- Design and evaluation of innovative interfaces for seamless and unobtrusive integration of technological devices in the normal daily routines of the ECEC teachers
- Automated management of feedback, quality assurance and continuous improvement of the ECEC curriculum contents with educator inputs
- Design of APIs for the integration of the systems used to deliver the educational material, for the tracking and evaluation of the learning process, or for the daily management of the ECEC unit operations

4.5 Final remarks

The “educare” model of Finnish ECEC is holistic by nature, covering mainly the education and care that give origin to its name, but also considering the environment, the social context, the policies and the interactions between children, educational staff and parents – among so many other aspects that allow to make it a reality. This complexity has puzzled Finnish companies, researchers and government, who are still trying to formulate an optimal strategy to productize, replicate and export ECEC services.

Holistic approaches are also difficult to address because the whole is not the same as the sum of each individual component. Therefore, it was often also difficult for me to set the boundaries of my literature review and my recollection of empirical evidence. More than once I had to rewrite entire sections, change the index and even the title of this thesis. The changes kept going on, until I simply felt overwhelmed by the volume of information and had to take a break. For this matter, the abductive research approach was a relief, because I could always resort back to the theoretical framework or the empirical evidence, and update or adjust each other as necessary, depending on the new findings. Otherwise this thesis would be just a list of headlines with no contents.

Despite the complexity of the research process, it is rewarding to feel that previous knowledge gets improved and new knowledge is created along the way. Getting involved in these tasks allowed me to grasp a clear idea of the role that technology can play in materializing, productizing, or making more tangible the complexity behind ECEC. Technology allows to reduce (without removing completely) the physical barriers of distance and time, making processes more standardisable, replicable and scalable. It helps to reduce the abstraction and intangibility of services such as the education of children, and generates artefacts along the way that provide evidence of the execution and the quality of the processes.

But technology is also far from describing the whole picture of ECEC services export. It can only act as distribution channel, or provide “tangible” evidence about the quality of the content creation and teaching-learning processes. The overall success – or the “pedagogical quality” of the Finnish ECEC model abroad – depends as well on the establishment of a correct administrative setting on the two operational sides of the education export activity. This configuration will be good on the same extent that those aspects which are still not “written on paper” or “set in stone”, like the staff requirements or the involvement of the parents as main responsible actors for the education and care of their children, can be successfully translated into concrete product and service offerings.

People abroad usually think that there are already laws and regulations for every aspect of ECEC in Finland, and thus they also expect something like that from the ECEC service providers. But Finland has been always

a rule-based society by nature, even when those rules are not yet bound by concrete laws. Most of them are simply passed on through generations by social cohesion and individual self-regulation. However, this is not the case with foreign markets, where the technologies that allow to enforce the Finnish methodologies and contents are needed, at least until the educational staff and school operators feel more comfortable and discover by themselves that there is no secret recipe for every single detail of the Finnish model. It is a fundamental requirement to adopt supporting technologies that set the guidelines and provide continuous support to keep the educational staff on the right track, but it is not a complete guarantee that the solution will deliver the expected results. Determining how mechanistic the operations of a Finnish pre-school abroad should be, is still an open-ended matter than can be always adjusted along the way, through the experiences obtained by companies abroad as the result of a more structured testing approach.

The lack of formal specifications represents an opportunity for anyone interested in the education export or EdTech industries, as there is still so much Finnish know-how out there that needs to be rationalized and turned into valuable artefacts for the benefit of developing nations. Conflictive perspectives may clash regarding the role of “education” in “export”, but it does not matter whether it is viewed as a commodity for sale, or maintained as a public good for the benefit of other societies, because understanding why the Finnish education system works is still a necessary task. When people wonder about the “Finnish model”, they could be actually expecting the “XYZ model” that *anyone* could provide to them. At the end, it all comes to understand what people really need and what is the best way to deliver it. And technology could eventually become the missing piece in this puzzle.

5 Conclusions

This chapter summarizes the main research findings, associated to the proposed RQ and SQ.

5.1 Answers to research sub-questions

This exploratory study has aimed to provide a comprehensive overview of Finnish ECEC export and the ways to improve the current strategies to sell its products and services supported by technology. At the beginning of the thesis, this objective was represented by the following broad question:

How to enable an effective productization and export of Finnish ECEC services through technology?

The research problem was divided into four sub-questions, addressed through an abductive approach that combined existing theory and empirical evidences from a case study. The sub-questions are summarized below:

5.1.1 How does the Finnish ECEC system work and what are its unique attributes?

Finnish ECEC follows the EduCare model which is holistic by nature, covering not only the education and care, but also the environment, the social context, the policies and the interactions between children, educational staff and parents. This complexity makes it harder for Finnish companies, researchers and government to formulate an optimal strategy to productize, replicate and export ECEC services.

The promise of a “school-in-a-box” or all-inclusive solution may have the initial appeal for potential new customers, who are marvelled by the good reputation of Finnish education in the international rankings. However, findings from the case study suggest that selling the complete package is a task that carries too many cultural, logistical, commercial and operational hardships. Therefore, selling separate products instead of the entire franchise could offer a more reasonable approach to enter the foreign markets.

5.1.2 How to model Finnish ECEC from a services perspective?

The delivery process of Finnish ECEC services can be separated between front-office and back-office (see 4.2.2.4 above). The back-office activities are related to materializing the existing know-how and transforming it into tangible artefacts that enable the standardization, replication, distribution and scalability of the services. For this reason, they deal mostly with the design of hard services, with a lower grade of intangibility and inseparability. On the other hand, the front-office is the interactive part of the services facing directly the people who pay for the franchise license. These customers are concerned in obtaining some proof of the delivery and quality of the services, which can be considered both an abstract and subjective goal. Therefore, this layer is also consistent with the definition of soft services with higher intangibility and inseparability.

Regarding the service offerings (see 4.2.2.5 above), the core product is constituted by the set of pedagogical contents, methodologies, learning goals, activity descriptions and teacher instructions that carry the essence of the Finnish ECEC curriculum. It depends on certain facilitating services which set the minimum conditions in terms of educator skills and operational environment. A further category belongs to the supporting services that can be provided on-demand anytime during the school year. The strategic combination of core, facilitating and supporting services makes them more attractive to fit the needs and requirements of each customer.

5.1.3 What are the weaknesses and strengths of the current productization strategy?

The analysis of the current productization strategy is summarized and presented as a SWOT matrix in Figure 27.

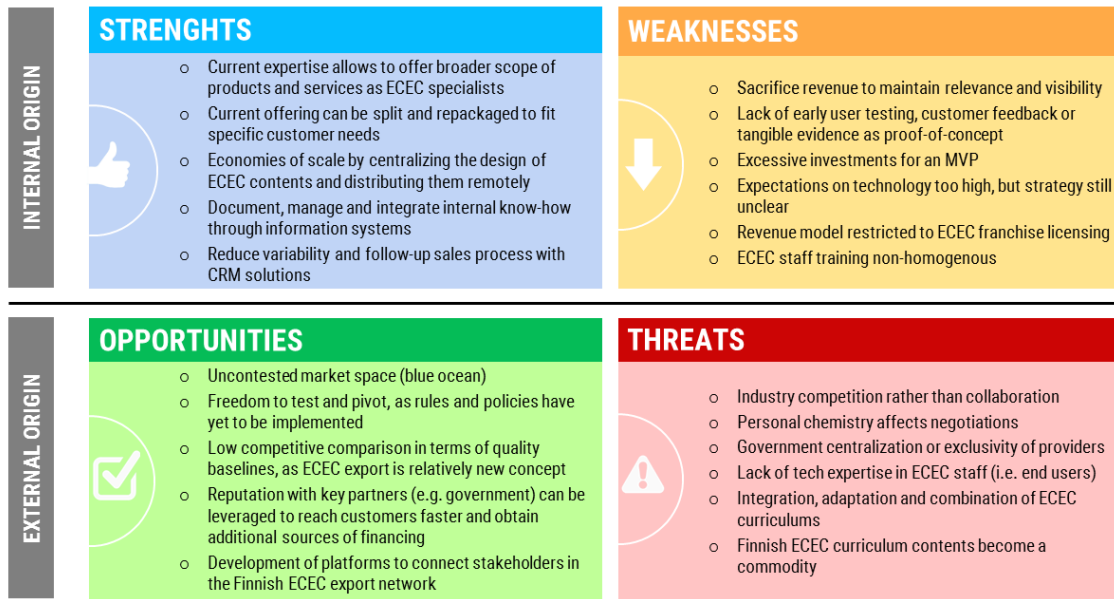


Figure 27: SWOT matrix of the Finnish ECEC productization strategy

5.1.4 What technology solutions can be proposed to improve the productization of Finnish ECEC?

The elements that compose the Finnish “preschool-in-a-box” franchise offering can be separated and productized up to a different extent, depending on their closeness to the traditional definition of “product” or “service” inside the continuum of solution provider firms (see Figure 13), which operate mainly under the S-D logic. The model of education as a service by Kempainen (see Figure 5) and the 2x2 matrix of effective PSS by Kuijken, Gemser and Wijnberg (see Figure 16) have been combined by the thesis author into a single model that facilitates the ideation of various ICT tools designed specifically for the servitization and/or productization of Finnish ECEC. Some examples of such potential information systems, platforms or applications are listed in Table 9.

The proposed solutions face two limitations: First, the existing academic literature and the case study suggest that technology can facilitate greatly the productization of hard services (i.e. education design), but have less potential when it comes to soft services (i.e. face-to-face teaching learning). Second, their implementation differs in terms of the required financial and human resources, which could exceed the operational capabilities of small companies such as the one addressed in the case study. In these cases, an MVP should be procured to gather early feedback, validate the value proposition and collect tangible evidence required to maintain market visibility and relevance.

Some potential solutions can be covered by existing off-the-shelf software, while others may require a dedicated in-house development team, as shown in Table 10. For small industry players, this comparative analysis should be perceived as an opportunity to use their available resources in a smarter way rather than attempting to build their own ICT solutions, as innovation does not necessarily imply creating new things, but making a good business case out of the existing technologies.

5.2 Summary of findings

Some of the aspects identified during the case study suggest that companies attempting to export Finnish ECEC should transition further from a G-D logic mindset (e.g. “the Finnish play-based curriculum is our core product and all other services are complementary to it”) into a S-D logic perspective (e.g. “we provide flexible ECEC solutions that combine core, facilitating and supporting services, generating tangible artefacts along the process

to evidence the quality”). This could allow them to develop their business strategy further and improve the clarity of their portfolio of products and services.

During the working period inside the company, it was observed that potential operators may get overwhelmed by the complexity of the sales and negotiation processes under a franchise licensing model. Thus, the transition into a more customer-centric approach could be better supported by splitting the current “preschool-in-a-box” franchise package into more flexible solutions that can be adjusted to needs and budget of each customer.

Regarding the daily operations of the preschool centres, incorporating technology and blending it in a natural way into the teaching workflow activities poses both organizational and technical challenges for service designers and technology providers alike, as the educators’ lack of technological expertise is a frequent entry barrier, irrespective of the target market selected. But even though ECEC professionals are unaccustomed to use technology actively in class, they are very aware of its importance and have high expectations in terms of the support they could provide.

Finnish companies exporting ECEC services should also engage in other types of initiatives that do not result in direct revenue gains, but which can be compensated by enabling an early test of their products and adjusting them based on real customer feedback. The platforms, apps or contents should not be localised too fast or incorporate major features without testing first an MVP with the end users. Otherwise, the risk of a failed negotiation may turn product development efforts into sunken costs, as exporting ECEC is still a long and complex process, despite the popularity and interest on the Finnish education system abroad.

Existing research on the export of Finnish ECEC suggest that the industry is still at an early stage, as the latest policies and strategies to structure a coherent innovation ecosystem around public and private collaboration are yet to be implemented. Education export is mostly a reputation-driven activity, so maintaining visibility, gaining relevance through verifiable experience and leveraging public-private networks are important requirements to succeed. However, the timing is still adequate for organizations interested in the industry, as there is still much expertise that can be turned into effective product-service systems.

References

- Aalto, P. (2006, April 22). *The Finnish Civil War as Depicted in Väinö Linna's Under the North Star*. Retrieved from <http://people.uta.fi/~paivi.aalto/CivilWar.html> [Accessed on 13 June 2017]
- Baines, T., Lightfoot, H., Benedettini, O., & Kay, J. (2009). The servitization of manufacturing: A review of literature and reflection on future challenges. *Journal of Manufacturing Technology Management*, 20(5), 547-567.
- BBC Mundo. (2015, December 03). *¿Por qué Finlandia está cambiando "el mejor sistema de educación del mundo"?* Retrieved July 06, 2017, from BBC Mundo: http://www.bbc.com/mundo/noticias/2015/12/151201_finlandia_cambio_educacion_ab.shtml
- BBC News. (2017, May 29). *Why Finland is changing its top-ranking education system*. Retrieved July 06, 2017, from BBC News: <http://www.bbc.com/news/av/education-40043254/why-finland-is-changing-its-top-ranking-education-system>
- Blomkvist, J., Holmlid, S., & Segelström, F. (2016). Service design research: Yesterday, today and tomorrow. In M. Stickdorn, & J. Schneider, *This is Service Design Thinking: Basics, Tools, Cases* (pp. 308-315). Amsterdam: BIS Publishers.
- Blomkvist, J., Segelström, F., & Holmlid, S. (2011). Investigating Prototyping Practices of Service Designers from a Service Logic Perspective. *Nordic Academy of Management conference*. Stockholm, Sweden.
- Brinded, L. (2017, February 9). *The best countries for raising a family, as voted for by expats*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2017/02/the-best-countries-for-raising-a-family-as-voted-for-by-expats> [Accessed on 13 June 2017]
- Buchanan, R. (2001). Design Research and the New Learning. *Design Issues*, 17(4), 3-23.
- Chen, D., & Cusmeroli, S. (2015). Framework for Manufacturing Servitization in Virtual Enterprise Environment and Ecosystem. *IFAC-PapersOnLine*, 48(3), 2244-2249.
- Codagnone, C., & Martes, B. (2016). *Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues*. Institute for Prospective Technological Studies.
- Colleoni, L. (2016). *Market entry into a crowded application market - an empirical study of a mobile sport application*. Aalto University, School of Science. Trento: Aalto University School of Science.
- Corbin, J., & Strauss, A. (2012). *Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory*. Thousand Oaks: SAGE Publications, Inc.
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles: SAGE Publications, Inc.
- Dervojeda, K., Verzijl, D., Nagtegaal, F., Mark Lengton & Elco Rouwmaat, P. N., & Erica Monfardini & Laurent Frideres, P. L. (2014). *Design for Innovation - Service design as a means to advance business models*. European Commission Business Innovation Observatory.
- D'Orio, W. (2017). *Finland is #1!* Retrieved July 07, 2017, from Scholastic.com: <http://www.scholastic.com/browse/article.jsp?id=3749880>
- Doyle, W. (2017, March). Action Plan Report for Global Education Brand Finland. Finland: Ministry of Education and Culture. Retrieved July 04, 2017, from <https://minedu.fi/documents/1410845/4150027/Action+Plan+For+Global+Education+Brand+Finland/765e3118-475e-486e-a023-c4f88ae289f3>
- Drack, M. (n.d.). *Ludwig Von Bertalanffy's early system approach*. Vienna, Austria: Department of Theoretical Biology, University of Vienna and Bertalanffy Center for the Study of Systems Science (BCSSS).

- Dredge, S. (2013, September 16). *Angry Birds Playground: Rovio catapults gaming into the classroom*. Retrieved August 11, 2017, from The Guardian: <https://www.theguardian.com/technology/appsblog/2013/sep/16/angry-birds-playground-education-rovio>
- Dubois, A., & Gadde, L.-E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research*(55), 553-560.
- Economist Intelligence Unit. (2012). *Starting Well: Benchmarking early childhood education across the world*. Retrieved July 18, 2017, from http://www.lienfoundation.org/sites/default/files/sw_report_2.pdf
- Education Finland. (2017). *The role of FLF*. Retrieved from Excellence in Education: <http://www.eduexport.fi/the-role-of-flf> [Accessed on 28 June 2017]
- El Cheikh, W. O. (2015). *Productizing Finnish Education for Export: The Barriers and Enablers of Internationalisation. A Multiple Case Study: Fifteen Members of Future Learning Finland*. Aalto University, Department of Management and International Business. Helsinki: Aalto University School of Business.
- Erramilli, M. K. (1990). Entry Mode Choice in Service Industries. *International Marketing Review*, 7(5), 50-62.
- Euronews. (2016, December 06). *Finland and Estonia top of the class in EU for education*. Retrieved July 07, 2017, from Euronews: <http://www.euronews.com/2016/12/06/finland-and-estonia-top-of-the-class-in-eu-for-education>
- European Commission. (2017). *The Digital Economy and Society Index (DESI)*. Retrieved July 07, 2017, from Digital Single Market: <https://ec.europa.eu/digital-single-market/en/desi>
- Eurydice. (2016, December 29). *Finland: Organisation of early childhood education and care other than pre-primary education*. Retrieved July 05, 2017, from https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Finland:Organisation_of_early_childhood_education_and_care_other_than_pre-primary_education
- Eurydice. (2016, December 29). *Finland: Teaching and Learning in early childhood education and care other than pre-primary education*. Retrieved July 05, 2017, from Eurydice: https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Finland:Teaching_and_Learning_in_early_childhood_education_and_care_other_than_pre-primary_education
- Eurydice. (2017, January 03). *Finland: Early Childhood Education and Care*. Retrieved July 04, 2017, from Eurydice: https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Finland:Early_Childhood_Education_and_Care
- Finnish National Agency for Education. (2017). *Early childhood education and care*. Retrieved July 04, 2017, from Finnish National Agency for Education: http://www.oph.fi/english/education_system/early_childhood_education
- Finnish National Agency for Education. (2017). *Education system*. Retrieved July 04, 2017, from Finnish National Agency for Education: http://www.oph.fi/english/education_system
- Finnish National Agency for Education. (2017). *Education system in Finland*. Retrieved July 04, 2017, from Studyinfinland.fi: http://www.studyinfinland.fi/destination_finland/education_system
- Finpro. (2017). *About Finpro*. Retrieved from Finpro: <http://www.finpro.fi/web/finpro-eng/finpro> [Accessed on 28 June 2017]

- Good News from Finland. (2015, February 10). *Rovio opens Angry Birds Playground in Singapore*. Retrieved August 11, 2017, from Good News from Finland: <http://www.goodnewsfinland.com/rovio-opens-angry-birds-playground-in-singapore/>
- Good News from Finland. (2016, October 12). *Finnish kindergartens to the Middle East next year*. Retrieved from Good News from Finland: <http://www.goodnewsfinland.com/fun-academy-s-finnish-kindergartens-middle-east/>
- Grekula, A. (2016). *Tangible Materials in a Service Co-Design Workshop With Asylum Seekers*. Aalto University, School of Science. Helsinki: Aalto University School of Science.
- Grönroos, C. (2000). *Service Management and Marketing: A Customer Relationship Management Approach*. Chichester, West Sussex, England: John Wiley & Sons.
- Grönroos, C. (2008). Service logic revisited: who creates value? And who co-creates? *European Business Review*, 20(4), 298-314.
- Harkonen, J., Haapasalo, H., & Hanninen, K. (2015). Productisation: A review and research agenda. *Int. J. Production Economics*(164), 65-82.
- Härkönen, U., & Jämsä, T. (2005). Systems Theory, Holism and Early Childhood Education: Introduction to the two approaches and education . *Müyesser Ceylan/Detlev Lindau-Bank (ed.) Between Holistic Education and Teacher Training. 3rd International Journal of Teacher Education and Training Conference Post-Conference-Book* (pp. 47-63). Vechta, Germany: Hochschule Vechta, Schriftenreihe zur Sozialen Arbeit.
- Helsinki International Schools. (2017). *ABOUT US*. Retrieved August 11, 2017, from Helsinki International Schools: <http://www.heischools.com/about/>
- Holmlid, S. (2007). Interaction Design and Service Design: Expanding a Comparison of Design Disciplines. *Design Inquiries*, 1-8.
- Iglookids International. (2017). *ABOUT US*. Retrieved August 12, 2017, from Iglookids International: <http://iglookidsinternational.com/index.php/about-us/>
- Iglookids International. (2017). *OUR CENTRES*. Retrieved August 12, 2017, from Iglookids International: <http://iglookidsinternational.com/index.php/our-centres/>
- InterNations. (2016). *The Best Destinations for Expat Families*. Retrieved from InterNations: <https://www.internations.org/expat-insider/2016/family-life-index> [Accessed on 13 June 2017]
- Jaakkola, E. (2011). Unraveling the practices of "productization" in professional service firms. *Scandinavian Journal of Management*(27), 221-230.
- Jackson, A. (2016, November 16). *Finland has one of the best education systems in the world — here are 4 things it does better than the US*. Retrieved July 07, 2017, from Business Insider: <http://www.businessinsider.com/how-finland-beats-america-on-education-2016-11?r=US&IR=T&IR=T>
- Kalb, I. (2016, July 01). *HuffPost*. Retrieved July 07, 2017, from Finland Is Still the World's Best Kept Secret: http://www.huffingtonpost.com/ira-kalb/finland-is-still-the-worl_b_10774930.html
- Kangas, J. (2016). *Enhancing children's participation in early childhood education through the participatory pedagogy*. University of Helsinki Faculty of Behavioural Sciences, Department of Teacher Education. Helsinki: Unigrafia.
- Kempainen, H.-M. (2016). *"This Is Reputation-Driven Activity": Higher Education as a Service Export and the Role of Partnerships*. Aalto University, Department of Management Studies. Helsinki: Aalto University School of Business.

- Kim, W. C., & Mauborgne, R. (2005). *Blue ocean strategy: How to create uncontested market space and make the competition irrelevant*. Boston: Harvard Business School Press.
- Kimbell, L. (2009). The turn to service design. In G. Julier, & L. Moor, *Design and Creativity: Policy, Management And Practice* (pp. 157-173). Oxford: Berg.
- Kimbell, L. (2011). Designing for Service as One Way of Designing Services. *International Journal of Design*, 5(2), 41-52.
- Kimbell, L. (2014). *The Service Innovation Handbook: Templates - Cases - Capabilities*. Amsterdam: BIS Publishers.
- Kimbell, L. (2016). Marketing: Connecting with people, creating value. In M. Stickdorn, & J. Schneider, *This Is Service Design Thinking: Basics, Tools, Cases* (pp. 46-51). Amsterdam: BIS Publishers.
- Koivisto, M. (2009). Frameworks for structuring services and customer experiences. In S. Miettinen, & M. Koivisto, *Designing Services with Innovative Methods* (pp. 136-149). Keuruu, Finland: Otava Book Printing Ltd.
- Kompa, J. S. (2012, September 19). Holism, General Systems Theory and the Biopsychosocial Model. *Biological, Psychological and Social Bases of Health and Behavior*. MSc Applied Psychology, University of Liverpool.
- Korhonen, N. (2015). *Making sense of complex stories: Experience-focused customer journey mapping for industrial services*. Aalto University, School of Arts, Design & Architecture. Helsinki: Aalto University School of Arts, Design & Architecture.
- KOULU Group. (2017). *About us*. Retrieved August 12, 2017, from KOULU Group: <http://koulugroup.com/homepage/about-us/>
- KOULU Group. (2017). *School development framework*. Retrieved August 12, 2017, from KOULU Group: <http://koulugroup.com/our-services-koulu/school-development-framework/>
- Kovács, G., & Spens, K. M. (2005). Abductive reasoning in logistics research. *Journal of Physical Distribution & Logistics Management*, 35(2), 132-144.
- Kuijken, B., Gemser, G., & Wijnberg, N. M. (2017). Effective product-service systems: A value-based framework. *Industrial Marketing Management*(60), 33-41.
- Kumpulainen, T. (2015). *Key Figures on Early Childhood and Basic Education in Finland*. Tampere: Finnish National Board of Education. Retrieved July 17, 2017, from http://www.oph.fi/english/publications/2015/key_figures_on_early_childhood_and_basic_education_in_finland
- Leikkigroup. (2017). *Services*. Retrieved August 11, 2017, from Leikkigroup: <http://www.leikkigroup.fi/business-areas/>
- Leoni, L. (2015). Servitization and Productization: two faces of the same coin? *RESER 2015*. Copenhagen: "Tor Vergata" University of Rome.
- Lewis, P. (n.d.). *The Emergence of "Emergence" in the Work of F.A. Hayek: An Historical Analysis*. London: King's College.
- Libert, B., Wind, Y., & Beck, M. (2014, November 20). *What Airbnb, Uber and Alibaba Have in Common*. Retrieved from Harvard Business Review: <https://hbr.org/2014/11/what-airbnb-uber-and-alibaba-have-in-common> [Accessed on 17 June 2017]
- Lovelock, C., & Gummesson, E. (2004, August). Whither Services Marketing? In Search of a New Paradigm and Fresh Perspectives. *Journal of Service Research*, 7(1), 20-41.

- Madhavaram, S., & Hunt, S. D. (2008). The service-dominant logic and a hierarchy of operant resources: developing masterful operant resources and implications for marketing strategy. *Journal of the Academy of Marketing Science*, 36, 67-82.
- Miettinen, S. (2016). Product design: Developing products with service applications. In M. Stickhorn, & J. Schneider, *This Is Service Design Thinking: Basics, Tools, Cases* (pp. 56-67). Amsterdam: BIS Publishers.
- Miles, I., Kastrinos, N., & Flanagan, K. (1995). *Knowledge-intensive business services - Users, carriers and sources of innovation*. Manchester: University of Manchester.
- Ministry of Education and Culture. (2010). Finnish education export strategy: summary of the strategic lines and measures : Based on the Decision-in-Principle by the Government of Finland on April 24, 2010. *Publications of the Ministry of Education and Culture 2010:12*. opetus- ja kulttuuriministeriö. Retrieved July 03, 2017, from <http://urn.fi/URN:ISBN:978-952-485-924-0>
- Ministry of Education and Culture. (2013, November 04). Suomi kansainvälisille koulutusmarkkinoille. Selvitysryhmän muistio: Toimenpideohjelma koulutusviennin edellytysten parantamiseksi. *Opetus- ja kulttuuriministeriön työryhmämuistioita ja selvityksiä 2013:9*. opetus- ja kulttuuriministeriö. Retrieved July 04, 2017, from <http://urn.fi/URN:ISBN:978-952-263-238-8>
- Ministry of Education and Culture. (2017). Finnish Education in a Nutshell. *Education in Finland*. Retrieved July 04, 2017, from http://www.oph.fi/download/171176_finnish_education_in_a_nutshell.pdf
- Ministry of Education and Culture. (2017). *Finnish Education System*. Retrieved July 04, 2017, from OKM - Ministry of Education and Culture, Finland: <http://minedu.fi/en/education-system>
- Ministry of Education and Culture. (2017, March 21). *International policy for Finnish higher education and research*. Retrieved July 04, 2017, from Ministry of Education and Culture: http://minedu.fi/en/artikkeli/-/asset_publisher/suomalaiselle-korkeakoulutukselle-ja-tutkimukselle-kansainvalisyyslinjaukset
- Ministry of Education and Culture. (2017, March 16). Yhteistyössä maailman parasta. Korkeakoulutuksen ja tutkimuksen kansainvälisyyden edistämisen linjaukset 2017–2025. *Opetus- ja kulttuuriministeriön julkaisuja 2017:11*. Opetus- ja kulttuuriministeriö. Retrieved July 04, 2017, from <http://urn.fi/URN:ISBN:978-952-263-457-3>
- Ministry of Social Affairs and Health. (2000, May). Early Childhood Education and Care Policy in Finland. *Publications of the Ministry of Social Affairs and Health 2000:21*. Helsinki, Finland: Ministry of Social Affairs and Health. Retrieved July 05, 2017, from <http://urn.fi/URN:ISBN:952-00-0907-8>
- Ministry of Social Affairs and Health. (2003). Government Resolution Concerning the National Policy Definition on Early Childhood Education and Care. *Publications of the Ministry of Social Affairs and Health 2003:9*. Helsinki, Finland. Retrieved from <http://urn.fi/URN:ISBN:952-00-1354-7>
- Ministry of Social Affairs and Health. (2004). Early Childhood Education and Care in Finland. *Brochures of the Ministry of Social Affairs and health 2004:14(3)*. Helsinki, Finland. Retrieved July 05, 2017, from <https://www.julkari.fi/handle/10024/114769>
- Mirza Iqbal, A. (2012, February 17). *Introduction to the Philosophy of Holism*. Retrieved from Thinkers' Forum USA: <http://www.thinkersforumusablog.org/archives/216> [Accessed on 14 June 2017]
- Moritz, S. (2005). *Service Design: Practical access to an evolving field*. Köln: Köln International School of Design. Retrieved June 19, 2017
- National Research and Development Institute for Welfare and Health. (2005). National Curriculum Guidelines on Early Childhood Education and Care in Finland. Retrieved July 05, 2017, from

- <http://www.julkari.fi/bitstream/handle/10024/75535/267671cb-0ec0-4039-b97b-7ac6ce6b9c10.pdf?sequence=1>
- OECD. (2012). *Quality Matters in Early Childhood Education and Care: Finland*. Retrieved July 18, 2017, from <http://www.oecd.org/edu/school/49985030.pdf>
- OECD. (2012, January 10). *Starting Strong III - A Quality Toolbox for Early Childhood Education and Care*. Retrieved July 18, 2017, from OECD: <http://www.oecd.org/edu/school/startingstrongiii-aqualitytoolboxforearlychildhoodeducationandcare.htm>
- OECD. (2015). *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*. Paris: OECD Publishing. doi:<http://dx.doi.org/10.1787/9789264233515-en>
- OECD. (2016). *Starting Strong IV: Early Childhood Education and Care Data Country Note Finland*. Retrieved July 18, 2017, from <http://www.oecd.org/edu/school/ECECDCN-Finland.pdf>
- OECD. (2017). *About - PISA*. Retrieved July 07, 2017, from OECD: <http://www.oecd.org/pisa/aboutpisa/>
- OECD. (2017). *Early Childhood Education and Care - Home*. Retrieved July 18, 2017, from OECD: <http://www.oecd.org/edu/school/earlychildhoodeducationandcare.htm>
- OECD. (2017, June 21). *Starting Strong 2017: Key OECD Indicators on Early Childhood Education and Care*. doi:<http://dx.doi.org/10.1787/9789264276116-en>
- Peltonen, M. (2016, November 7). *New concept to bring the Finnish day-care system to the world*. Retrieved August 11, 2017, from University of Helsinki: <https://www.helsinki.fi/en/news/new-concept-to-bring-the-finnish-day-care-system-to-the-world>
- Penn, J., & Wihbey, J. (2016, June 3). *Uber, Airbnb and the consequences of the sharing economy: Research roundup*. Retrieved from Journalist's Resource: <https://journalistsresource.org/studies/economics/business/airbnb-lyft-uber-bike-share-sharing-economy-research-roundup> [Accessed on 17 June 2017]
- Polar Partners. (2017). Retrieved from Polar Partners: <http://polarpartners.fi/>
- Rautakoura, A. (2013, April). *Finnish education expertise goes global*. Retrieved from thisisFINLAND: <https://finland.fi/life-society/finnish-education-expertise-goes-global/> [Accessed on 28 June 2017]
- Rusanen, A. (2017, June 20). *HEI Schools' first teacher training for Chinese team was a success*. Retrieved August 11, 2017, from Helsinki International Schools: <http://www.heischools.com/news/2017/6/20/hei-schools-first-teacher-training-for-chinese-team-was-a-success>
- Rusanen, A. (2017, April 23). *HEI SCHOOLS PILOT KINDERGARTEN IN BAOTOU, CHINA WILL OPEN IN COOPERATION WITH CHINESE AND FINNISH TEACHERS*. Retrieved August 11, 2017, from Helsinki International Schools: <http://www.heischools.com/news/2017/4/23/3f4o7te1ovwipalm8efnobqjs3azqb>
- Schatz, M. (2015). *Toward One of the Leading Education-Based Economies? Investigating Aims, Strategies, and Practices of Finland's Education Export Landscape*. *Journal of Studies in International Education*, 19(4), 327-240.
- Schatz, M. (2016). *Education as Finland's Hottest Export?* University of Helsinki, Faculty of Behavioural Sciences. Helsinki: Unigrafia.
- Segelström, F. (2012, February 20). *Co-creation, co-production and co-design in Service Dominant Logic*. Retrieved from <http://segelstrom.se/2012/02/co-creation-co-production-and-co-design-in-service-dominant-logic/> [Accessed on 18 June 2017]

- Segelström, F. (2013). *Stakeholder Engagement for Service Design*. Linköping: Department of Computer and Information Science, Linköping University.
- Shostack, G. L. (1982). How to Design a Service. *European Journal of Marketing*, 16(1), 49-63.
- Sims, J. (n.d.). 'The whole is greater than the Sum of its parts': What Principles of Systems Theory can teach us about Child Development. Nottingham, United Kingdom: The University of Nottingham.
- Smuts, J. (1926). Holism and Evolution.
- Social Progress Imperative. (2017, July 06). *Social Progress Index*. Social Progress Imperative. Retrieved July 07, 2017, from The Telegraph: http://www.socialprogressindex.com/assets/downloads/resources/en/English-2017-Social-Progress-Index-Findings-Report_embargo-d-until-June-21-2017.pdf
- Soegaard, M. (n.d.). *Gestalt principles of form perception*. Retrieved July 06, 2017, from The Glossary of Human Computer Interaction: <https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/gestalt-principles-of-form-perception>
- Spiller, P. (2017, May 29). *Could subjects soon be a thing of the past in Finland?* Retrieved July 06, 2017, from BBC News: <http://www.bbc.com/news/world-europe-39889523>
- Statistics Finland. (2017, July 12). *Finland among the best in the world*. Retrieved August 23, 2017, from Statistics Finland: http://www.stat.fi/ajk/satavuotiasuomi/suomimaailmankarjessa_en.html
- Stickdorn, M., & Schneider, J. (2016). *This Is Service Design Thinking: Basics, Tools, Cases*. Amsterdam: BIS Publishers.
- Talouselämä. (2017, March 6). "Eri toimijoiden pitäisi lopettaa omaan napaan tuijottelu ja tajuta, kuinka iso vientituote suomalainen koulutusjärjestelmä on". Retrieved August 15, 2017, from Talouselämä: <http://www.talouselama.fi/uutiset/eri-toimijoiden-pitaisi-lopettaa-omaan-napaan-tuijottelu-ja-tajuta-kuinka-iso-vientituote-suomalainen-koulutusjarjestelma-on-6630276>
- Taylor, A. (2012, November 27). *Why Finland's Unorthodox Education System Is The Best In The World*. Retrieved July 07, 2017, from Business Insider: <http://www.businessinsider.com/finlands-education-system-best-in-world-2012-11?r=US&IR=T&IR=T>
- Team Finland. (2017). *Team Finland organisations*. Retrieved from Team Finland: <http://team.finland.fi/en/team-finland-organisations> [Accessed on 28 June 2017]
- Tenz, C. (2017, June 9). *Celebrating 100 years of Finnish culture*. Retrieved from Deutsche Welle: <http://www.dw.com/en/celebrating-100-years-of-finnish-culture/a-39179021> [Accessed on 13 June 2017]
- Thoben, K.-D., Eschenbächer, J., & Jagdev, H. (2001). Extended Products: Evolving Traditional Product Concepts. *7th International Conference on Concurrent Enterprising*, (pp. 429-439). Bremen.
- Toskovic, T. (2016). *A different view on service design: The perspective of the participant*. Aalto University, School of Science. Helsinki: Aalto University School of Science.
- Transparency International. (2017, January 25). *Corruption Perceptions Index 2016*. Retrieved July 07, 2017, from Transparency International: https://www.transparency.org/news/feature/corruption_perceptions_index_2016
- Vandermerwe, S., & Rada, J. (1988). Servitization of Business: Adding Value by Adding Services. *European Management Journal*, 6(4), 314-324.
- Vargo, S. L., & Lusch, R. F. (2004, May). The Four Service Marketing Myths: Remnants of a Goods-Based, Manufacturing Model. *Journal of Service Research*, 6(4), 324-335.

- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36, 1-10.
- Vargo, S. L., Maglio, P. P., & Archpru Akaka, M. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 145-152.
- Vargo, S., & Lusch, R. (2004, January). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68, 1-17.
- Weller, C. (2017, May 15). *Finland is famous for its education system. What makes it different?* Retrieved July 07, 2017, from World Economic Forum: <https://www.weforum.org/agenda/2017/05/why-finlands-education-system-puts-others-to-shame/>
- Wenner Moyer, M. (2017, March/April). Getting Preschool Right. *Scientif American Mind*, pp. 26-34.
- Whitebread, D., Basilio, M., Kuvalja, M., & Verma, M. (2012). *The importance of play: a report on the value of children's play with a series of policy recommendations*. Brussels: Toy Industries of Europe. Retrieved July 18, 2017, from http://www.importanceofplay.eu/IMG/pdf/dr_david_whitebread_-_the_importance_of_play.pdf
- Williams-Grut, O. (2016, November 18). *The 11 best school systems in the world*. Retrieved July 07, 2017, from Business Insider: <http://www.businessinsider.com/wef-ranking-of-best-school-systems-in-the-world-2016-2016-11?r=US&IR=T&IR=T>
- World Economic Forum. (2016). *The Human Capital Report*. World Economic Forum. Retrieved July 07, 2017, from World Economic Forum: http://www3.weforum.org/docs/HCR2016_Main_Report.pdf
- World Happiness Report. (2016, March 16). *World Happiness Report 2016 Update Ranks Happiest Countries*. Retrieved July 07, 2017, from World Happiness Report: <http://worldhappiness.report/news/2016/03/16/world-happiness-report-2016-update-ranks-happiest-countries/>
- xEdu. (2017). *Portfolio*. Retrieved August 11, 2017, from xEdu: <https://www.xedu.co/portfolio/>
- Yle. (2016, May 15). *Finns remember Civil War, 'Red' and 'White' resentment lingers*. Retrieved from Yle Uutiset: https://yle.fi/uutiset/osasto/news/finns_remember_civil_war_red_and_white_resentment_lingers/8883294 [Accessed on 13 June 2017]
- Yle. (2017, August 14). *Children help plan daycare in new curriculum*. Retrieved August 15, 2017, from Yle Uutiset: https://yle.fi/uutiset/osasto/news/children_help_plan_daycare_in_new_curriculum/9774308
- Zeithaml, V. A., Parasuraman, A. P., & Berry, L. L. (1985). Problems and Strategies in Services Marketing. *Journal of marketing*, 49(2), 33-46.

Appendices

Appendix 1: Observation of Finnish ECEC centres



Figure 28: Finnish maternity and child health clinic (neuvola)



Figure 29: Fenced preschool outdoors with playground and green areas



Figure 30: Preschool classroom interior



Figure 31: Dollhouse play area



Figure 32: Exercise area



Figure 33: Reading and relaxation area



Figure 34: Stage for artistic performance and audiovisual contents



Figure 35: Play area



Figure 36: Play area

Appendix 2: Questionnaire templates for Workshop 1

Candidate stakeholder	Is a stakeholder?	Is our customer?	Is a tech user?
Potential partner in India interested in acquiring the franchise license for her school			
Potential corporate customer in Brazil interested in buying the entire product-service offering for its portfolio			
Teacher			
Teacher trainer			
Finnish advisor			
School director			
School operator			
Investor (i.e. angel or venture capital)			
Local training centre			
Franchisee partner (i.e. country/region operations and sales)			
Outsourced technology provider in Singapore			
Finnish architecture and interior design firm specialized in educational spaces			
Helsinki preschool			
<i>*Parents</i>			
<i>*Children</i>			
<i>*Local pedagogical partner</i>			
<i>*Local company (e.g. day-care facilities)</i>			
<i>*University</i>			
<i>*New stakeholders added or suggested by the workshop participants</i>			

Table 11: Stakeholders questionnaire used in Workshop 1

(OUR) TECHNOLOGY IS...

	Not needed at all	Helpful but not necessary	Completely necessary
Collect materials for arts' day			
Prepare the classroom			
Take photos during child activities			
Register children			
Unenroll children			
Explain how to use web platform			
Explain how to use mobile app			
Prepare child reports			
Publish child reports			
Access and read child reports			
Select or decide class activities			
Document executed class activities			
Define learning targets			
Measure accomplishment of learning targets			
Organize events and presentations			
Match franchise curriculum with local curriculum			
Select local stories, songs or poems			
Train teachers			
Create training material for teachers			
Register child's personal information			
Update child's personal information			
Publish description of class activities			
Read description of class activities			
Communicate with the parents or relatives			
Publish school news			
Give feedback to peers (i.e. educators)			
Track child's attendance			
<i>* Feedback / Reflect on franchise curriculum</i>			
<i>* Feedback / Reflect on product quality</i>			
<i>* QA / self-reflection of teachers</i>			
<i>* Follow child's participation</i>			
<i>*New stakeholder tasks added or suggested by the workshop participants</i>			

Table 12: Stakeholder tasks questionnaire used in Workshop 1

Appendix 3: Workshop 2 stakeholder map results

	TRAINING ROLES						
	FRANCHISE OPERATOR	PRINCIPAL / HEAD OF SCHOOL	PARENT	TEACHER	TRAINER	PEDAGOGICAL EXPERT	LOCAL TRAINING CENTRE
FRANCHISE OPERATOR		<ul style="list-style-type: none"> - Infrastructure, building, equipment (4) - Feedback (2) - Curriculum, product (2) - Guidance (1) - Program (1) - \$/€ (2) 	<ul style="list-style-type: none"> - Full service, quality teaching and education for child (1) 	<ul style="list-style-type: none"> - \$/€ (3) 	<ul style="list-style-type: none"> - \$/€ (1) 		
PRINCIPAL / HEAD OF SCHOOL	<ul style="list-style-type: none"> - Feedback (2) 		<ul style="list-style-type: none"> - Information about child development (1) - Program (1) - Full service, quality teaching and education for child (1) 	<ul style="list-style-type: none"> - Curriculum guidance, support (2) - Instructions, pedagogical leadership (2) - \$/€ (1) 			
PARENT	<ul style="list-style-type: none"> - \$/€ (3) - Children, students, customers (2) 	<ul style="list-style-type: none"> - Children, students, customers (3) - \$/€ (1) 		<ul style="list-style-type: none"> - Children, students, customers (3) - Good work environment (1) - \$/€ (1) 			
TEACHER		<ul style="list-style-type: none"> - Education, teaching workforce (2) 	<ul style="list-style-type: none"> - Full service, quality teaching and education for child (3) - Student evaluation (2) 				
TRAINER	<ul style="list-style-type: none"> - Training (1) 	<ul style="list-style-type: none"> - Methodology (1) 		<ul style="list-style-type: none"> - Training (1) 			
PEDAGOGICAL EXPERT				<ul style="list-style-type: none"> - Training (1) - Guidance (1) 			
LOCAL TRAINING CENTRE				<ul style="list-style-type: none"> - Training (1) 			

Table 13: Case study company stakeholders and their relations