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The Service Startup Model
A new model to support service entrepreneurship

Danilo Passos da Cruz

Master Dissertation
Master in Innovation and Technology Entrepreneurship

Supervised by:
Jorge Grenha Teixeira, PhD

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Danilo Passos da Cruz

Abstract

Entrepreneurs currently face the challenge of creating a successful startup that provides a desirable service to customers. Research about establishing a startup and about designing better services are available but are rarely considered together. This study aims to present a new model to support service entrepreneurship by understanding the synergies between Service Design and Entrepreneurship.

This study relied on the Design Science Research methodology, supported by individual semi-structured interviews with sixteen participants to understand the problem space. The interviews were conducted with entrepreneurs, designers, and business consultants from Brazil and Portugal. Data collected were qualitatively analyzed and codified using the NVivo software.

Five stages of the development process (discover, define, develop, deliver and grow) and four main challenge groups (strategy, team, financial and personal) were identified and characterized as a contribution of this study.

This research provides an iterative model, the Service Startup Model, that organizes crucial questions to be solved by entrepreneurs in different areas, such as problem vision, service concept vision, and growth vision, with culture values, resources, finances, and growth assumptions.

Keywords: Service Design, Entrepreneurship, Business Model

Resumo

Empreendedores enfrentam atualmente o desafio de criar uma *startup* que forneça um serviço desejável aos clientes. A investigação sobre o empreendedorismo e sobre a conceção de melhores serviços está disponível, mas raramente são considerados em conjunto. Este estudo visa apresentar um novo modelo para apoiar o empreendedorismo de serviços através da compreensão das sinergias entre o Design de Serviços e o Empreendedorismo.

Este estudo baseou-se na metodologia Design Science Research, apoiada por entrevistas individuais semiestruturadas com dezasseis participantes para compreender o contexto do problema. As entrevistas foram conduzidas com empreendedores, designers, e consultores empresariais do Brasil e de Portugal. Os dados recolhidos foram analisados e codificados qualitativamente utilizando o software NVivo.

Cinco fases do processo de desenvolvimento (descobrir, definir, desenvolver, entregar e crescer) e quatro grupos principais de desafio (estratégia, equipa, financeiro e pessoal) foram identificados e caracterizados como uma contribuição deste estudo.

Esta investigação fornece um modelo iterativo, o *Service Startup Model*, que organiza questões cruciais a serem resolvidas pelos empresários em diferentes áreas, tais como visão do problema, visão do conceito de serviço e visão de crescimento, com valores culturais, recursos, finanças, e pressupostos de crescimento.

Palavras-chave: Design de Serviços, Empreendedorismo, Modelo de Negócios

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List of abbreviations (alphabet order)

DSR	Design Science Research
HCD	Human-Centered Design
UI	User Interface
UX	User Experience

Chapter 1 – Introduction

The popularization of smartphones and access to investment funds has made the startup market increasingly competitive. Combining the possibilities of exploring new markets and expanding the existent with investors' growing interest to find the next unicorn, entrepreneurs found the right combination to catalyze the will to face large corporations or create new market niches (Osterwalder and Pigneur, 2013). Due to a lack of initial resources, startups are starting to take advantage of digital technologies to test and interact with their audience, attracting and retaining customers in a faster and cheaper way. However, technology alone is not enough for a company to thrive in the field of innovation. Entrepreneurs need to understand who the customer is and why their solution is crucial to them (Blank and Dorf, 2012).

Meanwhile, technology companies and consultancy companies are starting to think about innovating business by understanding how customers' behaviors in the physical world (Stickdorn *et al.*, 2017), and about User Experience in the digital world are relevant for technological business (Norman and Nielsen, no date). Thus, pursuing the process to better shape problem-based solutions and provide a better experience to users and customers, organized in stages of diverging and converging ideas (British Design Council, 2007).

Also, wanting to improve the quality of the service offering and the customers' perception of these services, Service Design has gained relevance in the market to understand and connect the human component (IDEO, 2009) and the aspects that support the service operation (Patrício *et al.*, 2011). However, it does not consider the aspects, such as the partners' objective, the team's profile, and resources to grow, essential elements considered to create a new business with this service offering.

Due to the lack of business concepts in Service Design and the lack of service components in entrepreneurship, this dissertation proposes to present a model where entrepreneurs can find support to service entrepreneurship considering challenges, such as internal culture, skill, and resources, but also customers' expectations, competitors and stakeholders that could impact on the business growth.

1.1. Motivation

During the 20th century, much has been studied and written about the development of new business, especially about the great industrial movements such as the Industrial Revolution, Henry Ford's mass production process and William Edwards Deming's quest for continuous improvement, and how this whole process could help companies to strengthen themselves (Bhuiyan and Baghel, 2005).

However, around the end of the last century, new lines of studies could be noticed. Two of them have a common understanding of problems and have traced parallel paths, the first is Service Design, and the other is Entrepreneurship.

The knowledge base about Service Design and Entrepreneurship is very recent. Even smaller if considered the knowledge base that deals with Service Design during the conception of startups that focus on service offerings.

Entrepreneurship and Service Design are two subjects suitable to be combined when establishing a new venture; both balance different customers' needs (Stickdorn *et al.*, 2017), market opportunities, and operationalizing the new business (Osterwalder and Pigneur, 2013). When Service Design considers the level of interaction and the experience from users in different touchpoints (Stickdorn *et al.*, 2017), Entrepreneurship is usually focused on validating a customer development and testing hypothesis (Blank and Dorf, 2012) to find the market fit and growth (Osterwalder *et al.*, 2014).

Bridging Entrepreneurship and Service Design could bring benefits to a business, such as: go faster to the market; be more assertive in the context of customers (or users) find more relevant services; founders could identify the main challenges in different stages and how to overcome those challenges. Furthermore, this bridge could bring new questions for researchers.

1.2. Objective

This dissertation aims to contribute to the current literature about Service Design and Entrepreneurship by proposing a new model to support the design of a service startup; this research also aims to build a bridge between Service Design and Entrepreneurship.

Following a Design Science Research Methodology (DSR), the outcome of this research is to present an artifact, the Service Startup Model, to help entrepreneurs, designers, and business administrators achieve business objectives with an outstanding service offer to the market. Through the DSR methodology was possible to support the development of the Service Startup Model, understanding the knowledge base by a literature review, and the relevant environment through a qualitative study involving sixteen interviews with entrepreneurs, designers, and business consultants.

1.3. Dissertation Structure

This dissertation is structured in 6 chapters; **Chapter 1** summarizes this dissertation's research topics, the identified motivations for this study, goals, and expectations about this dissertation's contribution. **Chapter 2** details the process through DSR methodology about the literature considered relevant for this study, building a relevant knowledge base for this research. **Chapter 3** reunites the patterns and gaps identified in the knowledge base related to Service Design and Entrepreneurship from the environment perspective. **Chapter 4** presents the Design Science Research as the foundation of this study and its implementation to understand the knowledge base and environmental aspects to propose a new artifact, the Service Startup Model. **Chapter 5** introduces the results obtained from the interview and the Service Startup Model proposal and how it could benefit service-oriented startups to structure and evolve the service and business aspects. Finally, **Chapter 6** presents the conclusions from this study and the proposition of future research to evolve the concepts presented in this dissertation.

Chapter 2 – Literature Review

This research focuses on understanding the gap between Service Design and startup development in its early stages. As such, this literature review covers the following topics: Entrepreneurship and Service Design.

Regarding Service Design, the literature covers the core concept definition about designing a relevant service. However, it has some overlaps with UX regarding the improvement of the experience in digital channels (Norman and Nielsen, no date), understand what the customer value is, and about management the structure of services (Patrício *et al.*, 2011).

There is shared knowledge about Service Design in the literature and practical knowledge about the UX definitions. However, most of this shared knowledge also has an intersection with Customer Experience, Interaction Design, and Customer management definitions. Still, different implementation cases are presented in digital business.

Most startup businesses are technological-based, and even when talking about processes, most of them rely on service-related processes. Therefore, it is essential to contextualize some Entrepreneurship aspects regarding how to structure a startup as new ventures, as spin-offs from universities investigations or corporate business.

2.1. Entrepreneurship

A startup could be defined as an organization in a quest to find a repeatable model to grow and establish it as a sustainable business in a short period (Blank and Dorf, 2012). In this context, entrepreneurship faces the challenge of driving a business from a chaotic system with unknown requirements to a complex adaptative system (Stacey, 1996) where

schemas are put in place to create a business model, a recipe to grow, a way to be scalable and to challenge the status quo of the market.

Existing literature already covers some fundamental aspects to developing a startup business, such as the challenge to expand your market from early adopters and sell your service or product to the mainstream market (Moore, 2014). Also, the importance of understanding your customer from the business perspective, gathering data and insights from customer needs, the task to be done, and pain points (Osterwalder *et al.*, 2014).

The Lean Startup (Ries, 2011) defined an iterative process to startup development based on: Build, turning ideas into a product; Measure, customers feedback from the product and Learn, from collected data to pivot (iterate) or preserve.

Sharing the principle in help entrepreneurs to model and develop a startup, the Business Model Generation (Osterwalder and Pigneur, 2013), introduced the idea of having a visual way to understand the startup by a Canvas. Filling nine building blocks (customer segments, customer relationships, channels, value proposition, key partners, key activities, key resources, cost structure, and revenue streams) in a visual tool, entrepreneurs can define aspects of a business and share their view about the business under development.

With Lean Startup and Business Model Generation, Entrepreneurship won a scientific approach to understand their business and face the challenges of building a business from scratch. However, especially when it is considered the service offering that sustains the business, some aspects were considered, such as experimentation and customer validation (Felin *et al.*, 2019). Furthermore, the entire process of developing a startup has a valuable contribution from the customer development process (Blank and Dorf, 2012), where it is possible to define customer hypotheses and test them with real people before market development and start up a business, as presented in Figure 1.

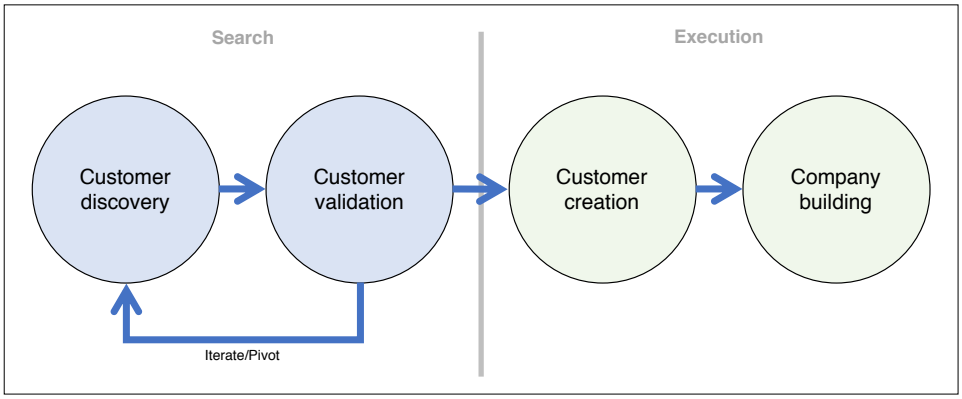

Figure 1: Customer development process from Blank and Dorf, 2012

Also, in the same perspective of Customer Development (Blank and Dorf, 2012), The Value Proposition Design (Osterwalder *et al.*, 2014) proposes a visual tool to define customers' profiles and identify the value being created to achieve the product-market fit. Customers are identified by their major jobs to be done, the pains they face, and perceived gains. Values are created from essential components of the offering and how they relieve pains and create gains for customers.

The available rich knowledge base about entrepreneurship mainly covers business aspects, such as identifying a market niche and establishing business operations. Still, it rarely goes deeper on about how to help entrepreneurs launch a relevant service and develop a business to support this service; this could be achievable through the Service Design knowledge base.

2.2. Service Design

Service Design is a set of activities and tools to create and orchestrate experiences that meet the needs of the business, the user, and other stakeholders (Stickdorn *et al.*, 2017). The main idea is to settle a mindset, a process, and a culture to understand the problems people are facing or opportunities that no other business is exploring (Stickdorn *et al.*, 2017).

During the last decades, businesses found new ways of obtaining a competitive advantage. As the digital revolution opened space for individual opinions, providing the right product was not enough; businesses needed to provide a good experience (Stickdorn *et al.*, 2017), where customers could give their opinion, improve sales and get businesses a step ahead of competitors.

The early stage of Service Design had its origins in teams from different backgrounds, such as marketing and engineering (Blomkvist, Holmlid and Fabian

Segelstrom, 2010). Over the years, Service Design got its own definition based on co-creation and human-centric design (Stickdorn *et al.*, 2017).

Human-Centered Design is a core concept for Service Design bringing the human element, in the role of customer or user, as the central piece to better understand, design, and implement a service (IDEO, 2009). It shifts the perspectives from actual business developments where companies look at their assets and push them to the market based on a competitor benchmark or the C-level strategy. Human-Centered Design is about understanding the human element as an individual and as a collective, map patterns and insights to gather the required assets to propose a solution to those customers or users.

Sharing a similar approach to Service Design, Design Thinking brought the HCD concept to propose an approach and a framework to develop innovative ideas and solutions (Brown, 2009). Design Thinking valorizes the visual and collaborative working in an iterative process within the problem area. Gathering data (diverging) and organizing it in a point of view (converging); and in the solution area, brainstorming for possible solutions (diverging) to prototyping and test them (converging), also explained as the concept of the double-diamond process (British Design Council, 2007).

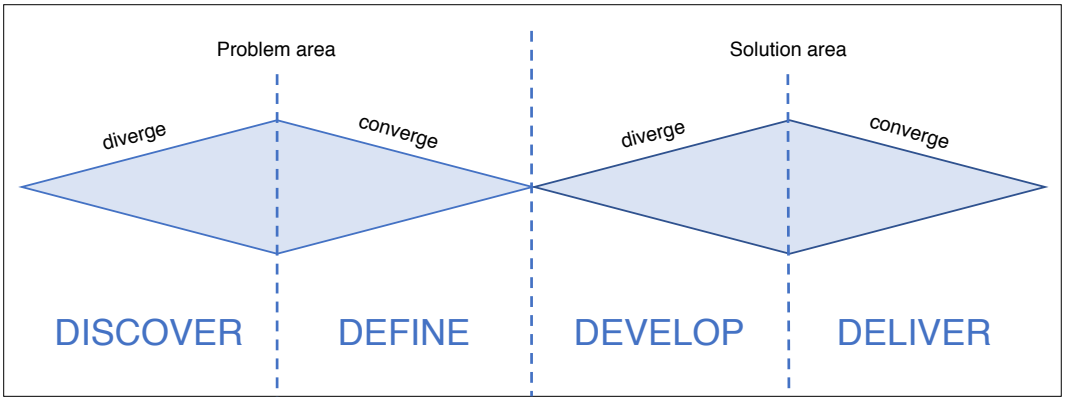

Figure 2: Double diamond diagram from British Design Council, 2007

Service Design reunites the Design Thinking approach and framework with other approaches that help understand the operational side of this service from the user perspective, e.g., Customer Journey, and what needs from the 'backstage' to deliver the proposed service, e.g., Service Blueprint (Shostack, 1984).

Sharing with Service Design, the idea of having the human component as a fundamental element in the design process, the term User Experience (UX) was conceived by Don Norman (Norman and Draper, 1986), explaining every aspect of the interaction between the person and the product, direct and indirect. Later his definition

was reviewed in Nielsen Norman Group article (Norman and Nielsen, no date), getting closer to what users see and touch in digital products, especially in screens (Simonsen, 2018), as User Interface (UI).

It is challenging to identify a unique definition for UX in literature. However, UX could be understood as the experience that users have in digital touchpoint as use a digital service, or it could be considered the design of an experience following user-centered design (Simonsen, 2018). That concept leads to a fundamental connection to Service Design. It opens the stage to improve the perceived value from users and customers about a specific service compared to its competitors. Furthermore, UX has essential considerations about the user interactions and touchpoints, which are also studied in Service Design, bringing the user, the human element, as the center of the design process, Human-Centered Design (IDEO, 2009).

Additionally, service design brings a considerable portfolio of tools that designers and entrepreneurs could use. Personas and the Empathy Map are tools with broad usage (Stickdorn *et al.*, 2017). They represent a particular group of people (Stickdorn *et al.*, 2017) related to the research question. It is the starting point to design a Journey map to help visualize the persona's experience over time (Stickdorn *et al.*, 2017). It can be related to the problem area or solution area to help identify gaps and improvement areas.

Once a designed a Journey map, it is possible to describe how it works through a Service design blueprint (Shostack, 1984), an extension of the journey map, but connecting the persona experience with frontend and backend people and process.

Through this process, it is possible to identify the context to design a service, identifying all the players in this context with a Stakeholders Map (Stickdorn *et al.*, 2017) and a Customer value constellation (Patrício *et al.*, 2011) and identifying the essential values to the customers in order to design the service concept. After understanding the customer, the context, and the proposed solution, service designers create a low fidelity prototype, such as mockups and role-playing situations, to explore, observe, validate and evolve aspects of the proposed solution (Stickdorn *et al.*, 2017).

By understanding both the concept of Entrepreneurship and Service Design, it is possible to understand the points of synergy and the differences between the two subjects, this synthesis is presented in the Table 1.

Table 1: Entrepreneurship and Service Design comparison

What	Entrepreneurship	Service Design
Objective	Find a repeatable model to grow and establish it as a sustainable business in a short period (Blank and Dorf, 2012).	Orchestrate experiences that meet the needs of the business, the user, and other stakeholders (Stickdorn et al., 2017).
Proposition	Customers pains, gains and tasks to be done filled by business offering to address customer needs (Osterwalder et al., 2014).	Users interactions and touchpoints improved to customer experience (Stickdorn et al., 2017).
Approach	Customer-centric (Blank and Dorf, 2012).	Human-centric (Stickdorn et al., 2017), (IDEO, 2009).
Process	The Search and Execution steps are defined in the customer development process (Blank and Dorf, 2012). Visual tools and rapid iterations are relevant to the process. The main stages for Entrepreneurship, following the Lean Startup (Ries, 2011) process are:	Service process is mapped over a Service Design Blueprint (Shostack, 1984), regarding frontstage and backstage. The process considers co-creation, visual tools and rapid iterations as relevant factors (Brown, 2009). Also, following converging and diverging steps as defined by the Double Diamond (British Design Council, 2007):
	-	**Discover** - understand the problem space
	-	**Define** - have a point of view over the problem, reframe the challenge in a different way
	Build - when the idea becomes a product, create a solution based on the idea area.	**Develop** - give different answers to the problem, co-design the solution
	Measure - test the product and collect customer feedbacks	**Deliver** - testing out different possible solutions at small scale. To improve or reject.
	Learn - from collected data to pivot or preserve	-
Iteration	It has an iterative process, but commonly named Pivots (Ries, 2011).	The whole process is structure as iterative (British Design Council, 2007).
Typical Tools	Business model canvas (Osterwalder and Pigneur, 2013), Value proposition design (Osterwalder et al., 2014), MVP (Ries, 2011), Customer development (Blank and Dorf, 2012).	Low fidelity Prototype, brainstorming, Personas, Empathy Map, Journey maps (Stickdorn et al., 2017), Customer value constellation (Patricio et al., 2011), Stakeholders map
Validation	Based on Hypotesis testing (Osterwalder and Pigneur, 2013) and prototyping to collect feedback and pivot (Ries, 2011).	Made use of low fidelity prototype to collect feedback and iterate (Stickdorn et al., 2017).
Financial	Focus on identify costs, profit & loss, cash flow and other aspects of business operations. (Osterwalder and Pigneur, 2013)	Usually, not a focus.

Chapter 3 – Research Gap

During the literature review for this dissertation, it was possible to identify some patterns and gaps between the knowledge base about Startup business development and Service Design. This process was the foundation of the research question of this dissertation in how it could be possible for service-oriented entrepreneurs to take advantage of the Service Design and Entrepreneurship approaches combined in one single model.

3.1. Patterns and Gaps

Entrepreneurship and Service Design have many similarities and differences, the same way Entrepreneurship and Design Thinking have. However, even sharing similar goals and tools, both communities do not refer to each other frequently (Mueller and Thoring, 2012), even less for Service Design and Entrepreneurship.

Design Thinking and Entrepreneurship have a common understanding of some concepts, such as processes are iterative, focus on the user/customer, navigate in uncertainty, and test concepts in the real world (Mueller and Thoring, 2012). At the same time, Design Thinking and Entrepreneurship have a different connection with qualitative and quantitative methods. Even though both approaches have the main goal for innovation, Design Thinking is not concerned with modeling the business.

Following the same structure, Service Design also has the same patterns presented about Design Thinking in the comparison. Nevertheless, it also includes some business and process aspects, for example, Multilevel Service Design (Patrício *et al.*, 2011) that covers the design of the service concept, the service system to the service encounter; and Service Blueprint (Shostack, 1984) which impact is relevant from a business perspective, but not define how a business should be structure, especially about from entrepreneurship

perspective. This lack of business-oriented relevance in Service Design could be challenging to service entrepreneurs looking to bridge the service concept into a business.

Some models developed exclusively to Entrepreneurship, such as Business Model Generation (Osterwalder and Pigneur, 2013), and Value Proposition Design (Osterwalder *et al.*, 2014), and business-oriented and do not consider service aspects, such as touchpoints, customer interaction, and expectation about the service and how to constantly operate it. The Value Proposition Design (Osterwalder *et al.*, 2014), and the Customer Development (Blank and Dorf, 2012) consider the human perspective of a customer, but mainly to identify a market fit and target the solution appropriately.

3.2. Research question

Also, during the literature review, it was possible to identify how Entrepreneurship and Service Design have been evolving during the last 20 years. Since the '.com bubble', entrepreneurs try to find ways to grow, scale, validate the business and also convince investors that the progress is real and people are willing to take their money to pay for this service. Nevertheless, Service Design evolved the principles about providing a relevant and desirable service, understanding the human behavior and interactions on service touchpoints (Stickdorn *et al.*, 2017).

The quest for innovation as the next competitive advantage may be the common catalyzer to Entrepreneurship and Service Design evolution. Therefore, it is relevant to understand how service-oriented ventures could combine Service Design and Entrepreneurship approaches, and propose a new model to address this challenge.

Chapter 4 – Methodology

This chapter illustrates the application of Design Science Research (Hevner *et al.*, 2004) and the main concepts of the Design Service Research for Service Design (Teixeira, Patrício and Tuunanen, 2019) in the design process of the Service Startup Model, specified in Chapter 5 – Results of this dissertation.

4.1. Design Science Research (DSR)

Following DSR, the development of the new artifact, the Service Startup Model, was built on the applicable knowledge base to ensure rigor, and the problem space in business needs, to ensure research relevance (Hevner *et al.*, 2004).

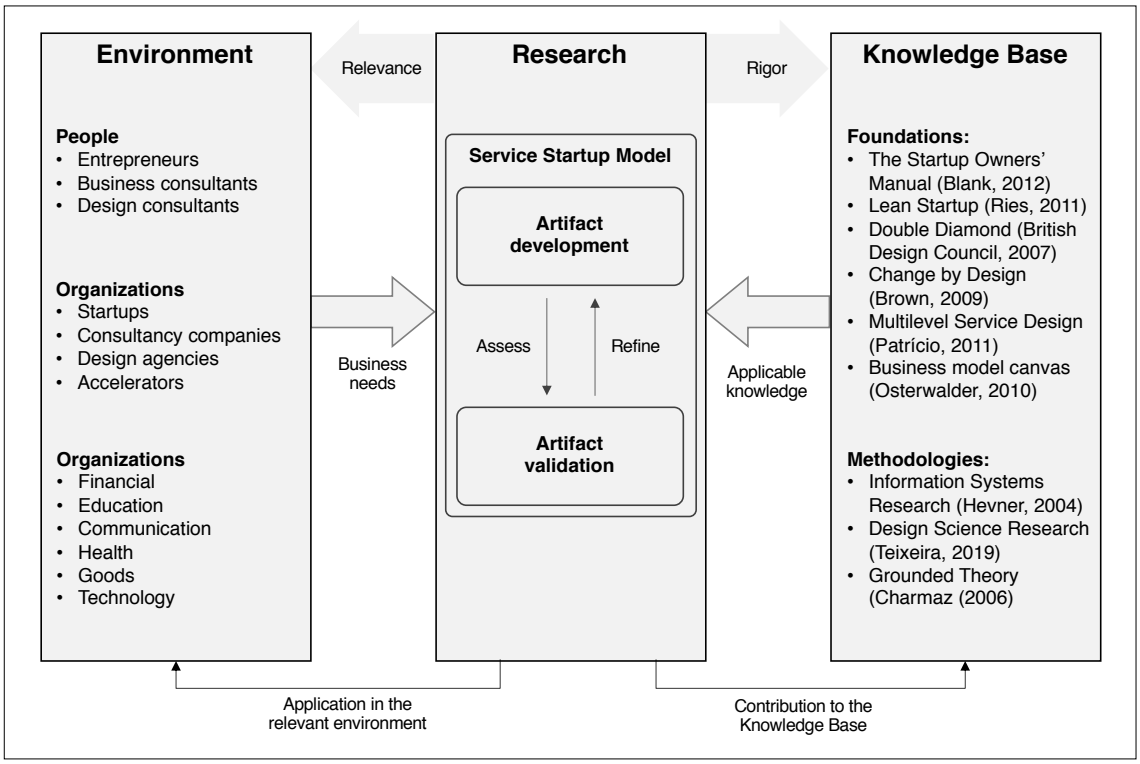

Figure 3: Information Systems Research Framework adapted from Hevner *et al.*, 2004

This research also followed the Design Service Research Methodology for Service Design (Teixeira, Patrício and Tuunanen, 2019). As such, this research started with the identification of the research problem by observing the problem in the appropriate environment; defining the objective of this research through literature review and interviews with relevant people; designing and developing an artifact, the Service Startup Model; evaluation of the Service Startup Model through user feedback; and communication to both academia and practice.

The development of this research was conducted bridging Relevance Cycles through interviews and validation about real-world problems; and Rigor Cycles through the existing knowledge described in the literature review (Teixeira, Patrício and Tuunanen, 2019).

The knowledge base of Rigor Cycles was identified as mentioned in Chapter 2 – Literature Review and covers the main concepts, methods, and tools about Startup business modeling, Service Design, and related subject as Design Thinking, Human-Centered Design, and User Experience.

Regarding the environmental aspect of the Relevance Cycles, the real-world problems and needs were identified with more than nine hours of interviews conducted between 1st December 2020 until 1st March 2021, with a total of sixteen people with different roles, capabilities, and backgrounds from fifteen organizations into business, service design and startup environments, such as fintech, education, pets, and public relation firms. Later, each interview was transcribed and analyzed in the NVivo software to structure the data in relevant codes (Charmaz, 2006).

Additionally, the Service Startup Model validation was conducted with five of the initial sixteen interviewees between the 17th and 21st of May of 2021, with twenty minutes each, to understand the relevant aspects and areas to improve, allowing to refine the Service Startup Model.

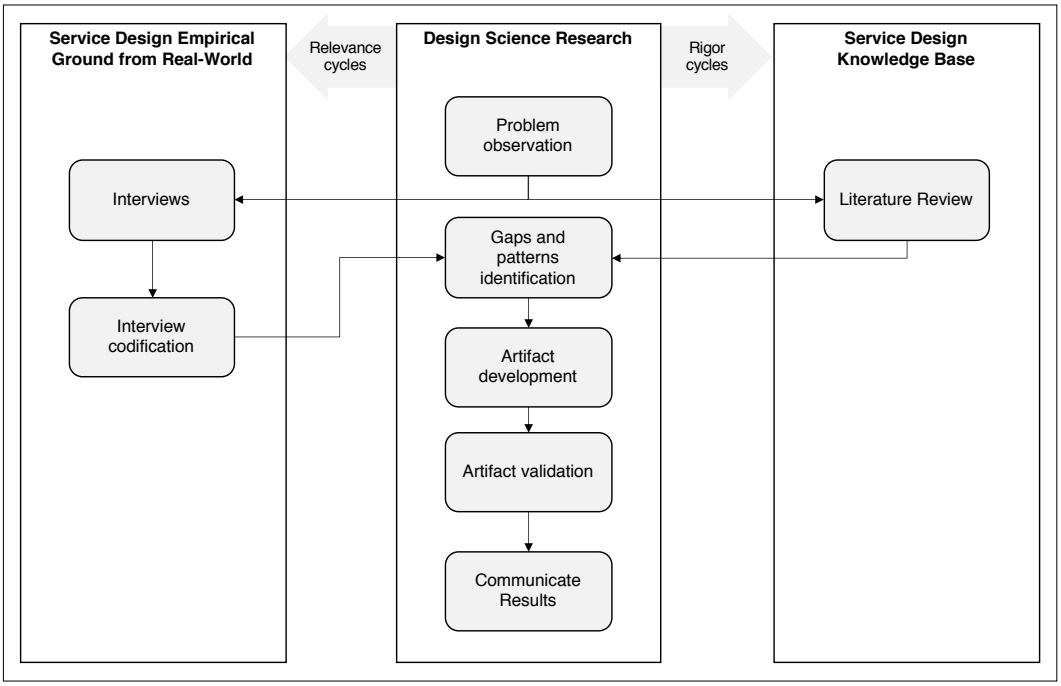

Figure 4: Research process based on Design Science Research adapted from Teixeira, Patrício, and Tuunanen, 2019

4.2. Data collection

The interviews were conducted in a semi-structured way with two main topics, first demographic information: and second experience about main challenges about entrepreneurship and design the service. The complete interview script is available on Annex I: Interview script.

About the experience in the field of this study, the interviewees were questioned about their experience, identified patterns about stages of development, main challenges, stakeholders, and tools.

The demographic information from these interviews is summarized in Table 2: Demographic information about interviewees.

Table 2: Demographic information about interviewees

#	Age	Gender	City	Country	Profile	Experience (years)	Role	Education level	Startup stage	Business age	Industry	Segment
1	28	Male	Porto	Portugal	Entrepreneur	9	CEO	Master (in progress)	prototype	9 m	Social network	B2C
2	44	Female	Sao Paulo	Brazil	Entrepreneur	25	Founder	Post graduated	established	2y6m	Communication	B2B
3	32	Male	Sao Paulo	Brazil	Entrepreneur	13	Founder	Bachelor	early stage	10y	Education	B2C
4	36	Male	Sao Paulo	Brazil	Entrepreneur	15	Founder	Bachelor	early stage	1y	Education	B2C
5	38	Male	Rio de Janeiro	Brazil	Entrepreneur	20	CEO	Master	established	4y	Pet	B2B/B2C
6	27	Male	Porto	Portugal	Entrepreneur	5	Founder	Master (in progress)	prototype	10m	Food	B2C
7	34	Female	Sao Paulo	Brazil	Entrepreneur	19	Founder	Post graduated	established	6y4m	Business facilities	B2B
8	28	Female	Rio de Janeiro	Brazil	Entrepreneur	8	CMO	Bachelor	established	4y	Pet	B2B/B2C
9	41	Male	Porto	Portugal	Entrepreneur	20	CEO	Post graduated	scale	2y4m	Financial	B2B
10	35	Male	Sao Paulo	Brazil	Entrepreneur	16	CFO	Post graduated	prototype	10m	Health	B2B/B2C
11	41	Male	Sao Paulo	Brazil	Entrepreneur	16	Founder	Bachelor	established	1y6m	Accelerator	B2B
12	38	Male	Sao Paulo	Brazil	Consultant	12	Business consultant	Specialization	-	-	Consultancy	B2B
13	27	Male	Porto	Portugal	Consultant	10	Strategy consultant	Master	-	-	Media agency	B2B
14	32	Male	Porto	Portugal	Consultant	8	Innovation and marketing manager	Master	early stage	5y	Textile goods	B2B
15	47	Male	Lisbon	Portugal	Consultant	24	Service designer	Master (in progress)	-	-	Design agency	B2B
16	36	Male	Sao Paulo	Brazil	Consultant	16	Innovation consultant	Post graduated	-	-	Technology	B2B

4.3. Data Analysis

All the content from 16 interviews was recorded, transcribed, and coded in Nvivo software. The coding process was conducted by an initial coding, understanding relevant topics, and comparing different interviews and their relation to the subject of study. Data analysis was also structured in line-by-line and incident-to-incident coding (Charmaz, 2006).

All codes were structured and clustered by affinity and reviewed in terms of description and context related to significant categories of codes (Charmaz, 2006). This process took place from the first interview until after all interviews were concluded. Thus, as interviews and data analysis evolved was possible to have an overview of all collected data and identify possible information gaps to be covered.

Following DSR, coding all collected data was essential to identify patterns and insights to provide knowledge about the environment, thus strengthening the research relevance. The complete list of codes and categories organized during the data analysis process is presented in Annex II: Interview codebook.

Chapter 5 – Results

The results of this study are threefold. First, based on the analysis of the interviews, it was possible to establish the main structure of codes and significant categories, such as Challenges, stages, Main Stakeholders, and Tools, that supported the development of the Service Startup Model (Charmaz, 2006). Second, considering the results from the interviews that, from a DSR perspective, explored the environment surrounding the problem and the knowledge base covered in the literature review, it was possible to develop a new tool to support service entrepreneurship: the Service Startup Model. Third, the relevance of the Service Startup Model was validated through interviewing five of the sixteen interviewees of data collection.

5.1. Interview results

As an outcome of the data analysis process, the first level of codes was identified by clustering similar concepts mentioned by interviewees. This first level was structured into main categories: Challenges, Stages, Main Stakeholders, and Tools.

Table 3: Information categories structure in interviews analysis

Category	Files	References
Challenges	**16**	**189**
Strategic	16	77
Team	12	33
Financial	9	32
Personal	9	47
Main stakeholders	**16**	**94**
Customers	8	12
Partners	6	6
Collaborators	5	8
Investors	4	4
Suppliers	4	5
Accelerators and incubators	3	5
Mentors	3	4
Other entrepreneurs	3	9
Consultants	2	2
Family	2	2
Friends	2	6
Government	2	2
Universities	2	3
Ecosystem	1	1
Regulatory agencies	1	1
Stages	**16**	**386**
1 - Discover (Business Insight)	10	29
2 - Define (Validating the problem)	16	110
3 - Develop (Structuring the business and service)	16	146
4 - Deliver (Validating solution)	13	82
5 - Growth	9	18
Tools	**16**	**67**
Search	10	17
Modeling	9	28
Validation	5	12
Others	4	5
Communication	3	3

Challenges

Includes the most relevant challenges faced by interviewees to structure a new service and a new business, mainly difficulties but also considered lessons learned to deal with a specific situation. This topic covered aspects such as Financial, Personal, Strategic, and Teams challenges.

Stages

Interviewees mentioned some main steps to develop a service or a startup that sometimes could be distinguished, although most of them overlap and could be repeatable, suggesting an iterative process. It was organized in main stages, as Discover (when the first insight comes); Define (when it is time to understand and validate the problem area); Develop (structuring what is required to run the business and deliver the proposed solution); Deliver (validating the solution with customers and prototypes) and Growth (expanding the business and operations).

Main stakeholders

People and the environment are essential aspects to kick-off a new service and business. They could influence founders and designers differently, from problem/solution insights to access to investments, knowledge, and technology. The main stakeholders most mentioned by interviewees were customers, partners, collaborators, and suppliers. These stakeholders were considered crucial to the development and feedback of service and promote the business's structure around the proposed solution.

Tools

In order to achieve their goals, consultants and entrepreneurs rely on a series of tools to achieve their goals. Therefore, most of the interviewees search for frameworks and tools available in the literature or proposed by acceleration programs. Mentioned tools during the interviews were organized into two main groups, considering their objective: modeling the service and its business aspects, understanding the context and market, and communicating and validating assumptions with customers and other stakeholders.

Table 4: Stages and Challenges comparison by codes in interviews

#	Challenges	Discover (Business Insight)	Define (Validating the problem)	Develop (Structuring the business and service)	Deliver (Validating solution)	Growth
1.0	**Strategic**	**1**	**7**	**11**	**5**	**3**
1.1	Market knowledge	1	6	8	2	2
1.2	Process and technology	1	1	6	4	1
1.3	Objectives and vision	1	2	2	0	1
2.0	**Team**	**0**	**1**	**6**	**0**	**1**
2.1	Right roles to hire	0	0	4	0	1
2.2	Culture development	0	1	2	0	0
2.3	Partners relationship	0	0	1	0	0
3.0	**Financial**	**0**	**1**	**5**	**1**	**4**
3.1	Lack of resources	0	1	4	0	1
3.2	Financial planning	0	0	1	1	3
3.3	Others	0	0	1	0	0
4.0	**Personal**	**3**	**1**	**1**	**2**	**1**
4.1	Personal life and Business	2	1	1	2	1
4.2	Keep the motivation	1	0	1	0	0
4.3	Working solo	0	0	1	0	0

In Table 4, it is possible to notice that some challenges are more frequent in some stages; interviewees mentioned some aspects regarding why this happens. Personal aspects seem to be important in the Discover and Delivery phases. The decision about how to drive a new venture can have a decisive impact on personal life balance. Strategical challenges start to be more relevant in the development stage when entrepreneurs consider strategies to support the idea into a solution and process. Financial challenges are also considered when settling a solution and scaling the business looking for options to fund the business growth. Team challenge follows Strategical and Financial ones as a balance between what needs to be done and the budget becomes more pressing while maintaining and improving people engagement and performance.

Each identified challenge (strategy, team, financial and personal) was placed as a cross-functional aspect of the five stages, considering different relevance and perspectives, as presented in Figure 6. The relevance for each intersection between a challenge and stage was identified based on interviewees' quotes. Strategy challenges are presented in Table 5; Team challenges are presented in Table 6; Financial challenges are presented in Table 7; Personal challenges are presented in Table 8.

Table 5: Results about strategy challenges and service business design stages

		DISCOVER	DEFINE	DEVELOP	DELIVER	GROWTH
STRATEGY	Vision	Vision and solution aligned and well designed in the problem space.	Have the vision shared and understood by all partners and the team.	Determine what can be adjusted and what should remain unchanged in the vision and purpose.	Not mentioned.	Keep the focus on the vision while handling operations and growth.
		"If you are not creating a solution to an existing problem or not solving a relevant issue, you will not make the curve you need to scale your business." "One of the biggest mistakes entrepreneurs make is building a business model before they have immersed themselves in understanding the problem."	*"The team has a very good maturity to understand what the user is saying that is a priority and what is nonsense."*	*"I don't give up the purpose; I don't give up the final goal. (...) The 'What' has to be fixed, out of the question. The 'How' can change."*		*"You see the team losing focus a little bit. And then start getting lost in little things that don't matter, and our job as a manager is to take these people by the hand and drag them back to focus."*
	Ecosystem	Understand the problem and the solution.	Deepen the knowledge with potential customers about their relationship to the problem. Establish a common point of view of the problem.	Launch a conceptual prototype to get customer validation and feedback.	Identify and grow a base of early adopters, identify communities related to the subject.	Create a network to sustain growth.
		"Where is the problem? What are you trying to do? Where is your industry? Have you done an analysis, a relevant Benchmark against competitors?"	*"Interviewing a solid base of people, we ran questionnaires, we tried to find coincidences of what people are talking about, what is unanimous, strongly agree, and totally agree."*	*"We launched the MVP of the platform in the Netherlands. Within a week, we realized it wouldn't work because our solution did not solve some problem elements."*	*"We had contact with people who were already looking for solutions that we were offering. So we invited them to participate, to co-create, to receive, to buy." "What not everyone can do is find the market fit and follow through. But in general, everyone has the prototypes ready to go to market."*	*"One of our investors, a director of an important bank, very well connected, brought several investors to us, but also help us as an advisor." "I would say networking because accelerators do not always select startups because they are good. Many bad startups are selected."*
	Backstage (Process and technology)	Identify ways to collect data from the ecosystem.	Establish a process to understand and review information gathering about the problem, stakeholders and ecosystem.	Identify core competencies in the business and a buy/develop decision.	Evaluate and improve process and technology.	Identify the balance between investment, indicators and strategy.
		"Spend enough time in the ideation phase because you will save later on solving the business problem."	*"What we do is based on KPI. To make it less opinionated in the wrong sense, we have to have an opinion but always based on it. (...) So we reinvent solutions according to regular and periodic research on the most diverse business issues to stay up-to-date."*	*"Know when to listen to customers' feedback from the MVP and the interaction and know when to follow your business idea path. I think that's the main challenge, to understand what you need to give up."*	*"I found out that I don't need to have such a good website, but I drive away customers if I have a bad website. Sometimes it is better to have no website than a bad one." "One difficulty is being able to identify when you should start having metrics. Because without measuring, you can't act or manage based on the correct information."*	*"We don't want to invest too much in a business that we need to have more data, more elements to be sure if it has business or not."*

Table 6: Results about team challenges and service business design stages

<table>
<tr><th></th><th></th><th>DISCOVER</th><th>DEFINE</th><th>DEVELOP</th><th>DELIVER</th><th>GROWTH</th></tr>
<tr><td rowspan="5">TEAM</td><td rowspan="2">Partnership</td><td rowspan="5">Not mentioned.</td><td rowspan="2">Not mentioned.</td><td>Have all founders aligned about the vision and strategy of the solution and the business.</td><td rowspan="5">Not mentioned</td><td rowspan="3">Not mentioned</td></tr>
<tr><td>"Decision-making is always challenging. The structuring of decision-making needs to be very well thought out, and the responsibilities of each of the founders and decision weights."</td></tr>
<tr><td>Culture</td><td>Assemble a culture based on vision and purpose aligned with customer needs.</td><td>Assure that all internal stakeholders are aligned with the culture.</td></tr>
<tr><td>Culture</td><td>"Unbelievable gadgets appear, but the vision behind them turns out to be a vision of the product developer and not of someone who wants to solve an issue, a real problem."</td><td>"My biggest job today as a manager is to make sure that everyone is on the same page, looking in the same direction, and motivated and happy."</td></tr>
<tr><td rowspan="2">Skills</td><td rowspan="2">Not mentioned</td><td>Manage key roles to evolve the business</td><td>Consider the right skill in the business budget.</td></tr>
<tr><td>"In technology, we still have this difficulty finding talent. Due to budget issues, our team is very limited and, as a consequence, our technology cannot advance the way we would like."</td><td>"But when we found another programmer, we still didn't have any money."</td></tr>
</table>

Table 7: Results about financial challenges and service business design stages

		DISCOVER	DEFINE	DEVELOP	DELIVER	GROWTH
FINANCIAL	**Financial planning**	Not mentioned.	Not mentioned.	Plan and test sales strategies to initial customers	Plan and test investments to target a broader market	Create an investment and growth plan aligned with business strategy
				"It was a big mistake to give discounts on the first day."	*"I said, well, I need to grow, and I started investing money in Google. In 2015 it was the first time it went wrong, then we saw that we were doing some things wrong; our site was crappy. We spent all our budget and got nothing."*	*"If they gave me a million of Reais, I wouldn't know what to do. But then came the investment fund, offering me 4 million, and I thought, where will I spend this money to make sense." "The entrepreneur's main mistake is not understanding that planning is essential."*
	Resources		Identify the balance between budget, resources, time to market and strategy.	Review strategy considering resources available	Not mentioned.	Align growth requirements with resources needed and financial plan
			"In this phase, many entrepreneurs have scarce resources and don't have many people working, so things are far from ideal in terms of structure. So you do things the way you can."	*"Understanding the problem, deriving the best solution, and making this solution tangible quickly and evolving is very challenging for the entrepreneur because there is no much time."*		*"Obviously, money is important. Everybody needs money; everybody needs to pay the bills, the world is capitalist, and that's how it works."*

Table 8: Results about personal challenges and service business design stages

		DISCOVER	DEFINE	DEVELOP	DELIVER	GROWTH
PERSONAL	**Motivation**	Find the balance between personal motivation and providing a real solution to the market	Not mentioned.	Keep motivation during unexpected problems	Not mentioned.	Not mentioned.
		"The entrepreneur has the situation of falling in love with the idea and wanting to take it to the market. This situation is a trap, which the entrepreneur needs to be very careful of during the process."		*"Now an entrepreneurial friend of mine has managed to set up a team and has suffered a big blow; one programmer wants to leave the team, and the other, who is a friend of the first one, has said that if he leaves, he will go too."*		
	Personal life	Understand the impact between choices in personal life and business	Manage personal expectations about the solution before having an understanding of the customer's needs.	Take advantage of a personal network to expand your subject knowledge and collect feedback	Evaluate the impact of personal branding in the business	Have personal goals aligned with business goals
		"Usually, the entrepreneur has a need, or he wants to become an entrepreneur, or he has a perfect opportunity. Because just quit or lost his job or has an excellent chance to get together with a friend and build a business."	*"First, my need appeared; I started looking for a solution to my condition, tried several things, found the best solution, and only continued because the solution I found for my need solved my client's problem. Only then did it make sense."*	*"In the beginning, I went out a lot and ended up talking to people, and this is how we learned a lot."*	*"I found out that it was complicated to sell to people I didn't know, so I had to go to the internet, but on the internet, I needed to show people who I am because nobody knew me."*	*"We, like many startups in the function of market opportunities, made some bad decisions. Fortunately, we pivoted quickly from them."*

5.2. Development of the Service Startup Model

Following the data collection and analysis of the interviews with entrepreneurs, the next stage involved designing and developing a new artifact, the Service Startup Model. This model supports each of the five identified stages: Discover, Define, Develop, Deliver, and Growth. These stages are based on the same aspects from Double-diamond (British Design Council, 2007), plus a Growth stage. The aspects related to the first four stages (Discover, Define, Develop and Deliver) mentioned by interviewees coming from the perspective of designing a service, but for the last two (Deliver and Growth), interviews started to consider the aspects about how a business can be structured around the designed service, identified as 'Business iteration process' on Figure 5, these aspects together combine the service perspective of Service Design and the business orientation of Entrepreneurship.

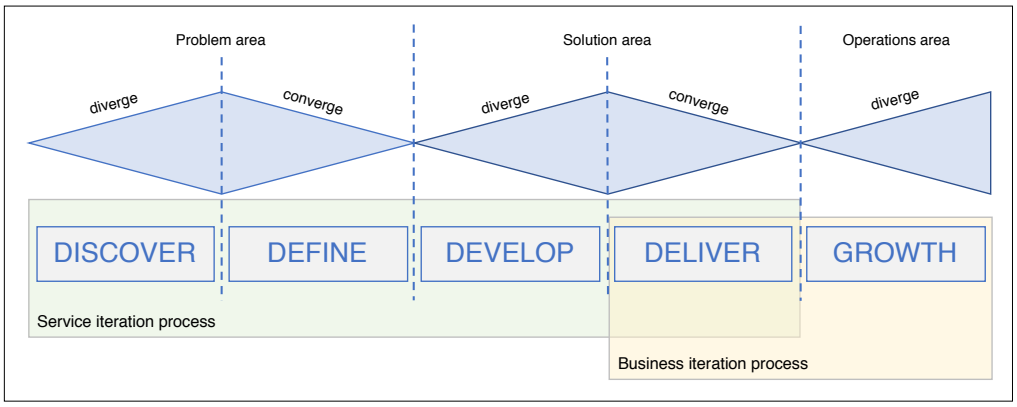

Figure 5: The Double Diamond and the main stages for a service business design

Furthermore, interviewees mentioned the main challenges during the process of setting a service business. This information, collected during the data analysis, was distributed in the five stages of the service business design. Additionally, the data analysis could include challenging components into a cross-functional structure, as presented in Figure 6.

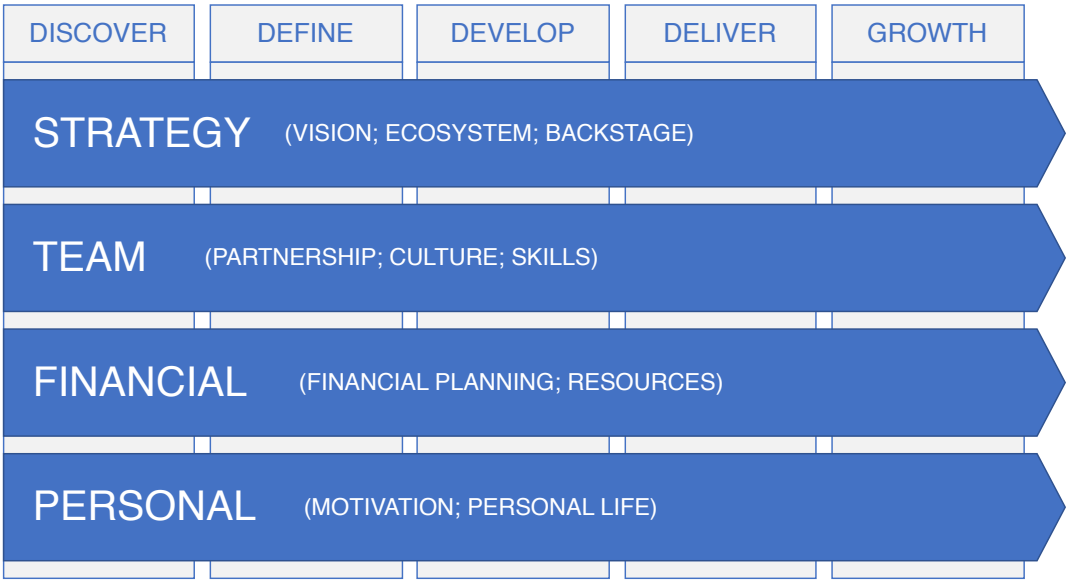

Figure 6: Challenges across service business design stages

Considering the complexity of challenges faced by entrepreneurs during the five stages to establish a service business, it was essential to combine the literature review with interviews, insights, and feedback to develop a new method to support and organize the actual process of service design and startup modeling.

Comparing the relevance of each challenge in the different stages, as represented in Figure 7, it was possible to identify a pattern to start structuring the Service Startup Model. The main challenges, especially regarding Strategic, are more relevant during the Develop Stage when the service is beginning to be structured, which shows how important it is to have a model bridging business-oriented and service-oriented aspects.

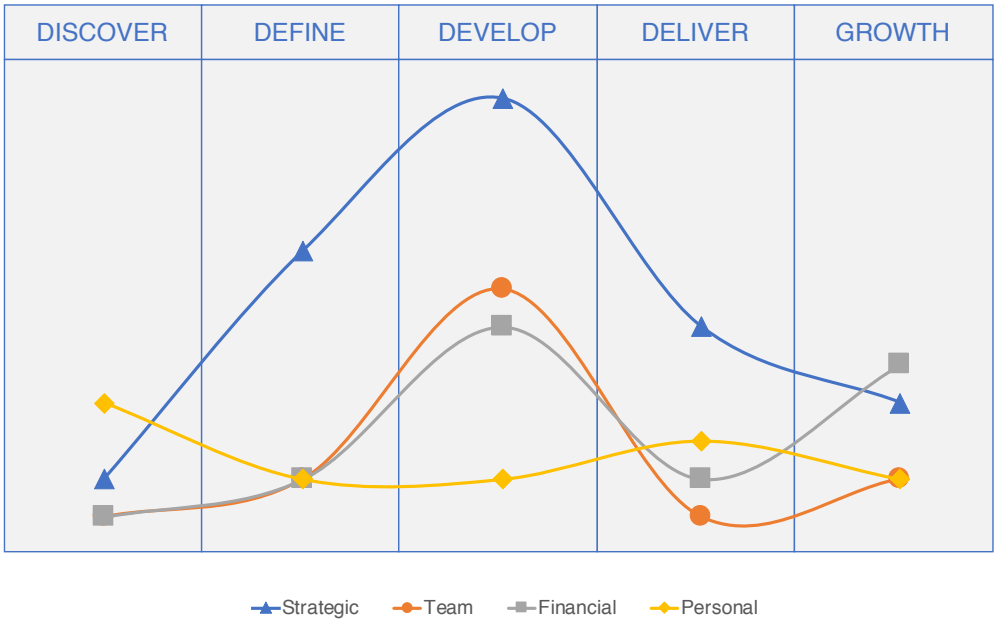

Figure 7: Interviewees mentions about Challenges over Stages

The main challenges mentioned by interviewees were organized by affinity clustering to draft a first version of the Service Startup Model. Later, through the knowledge base, an approach was established to present the Service Startup Model easily. As with the Business Model Canvas (Osterwalder and Pigneur, 2013), a visual approach was taken. Clusters of information were organized in seven blocks and illustrated in the visual structure considering the relationship between them and information flow through an iterative design process. Finally, from the environment perspective, the challenges mentioned by interviewees were distributed to compose the Service Startup Model as presented in Figure 8.

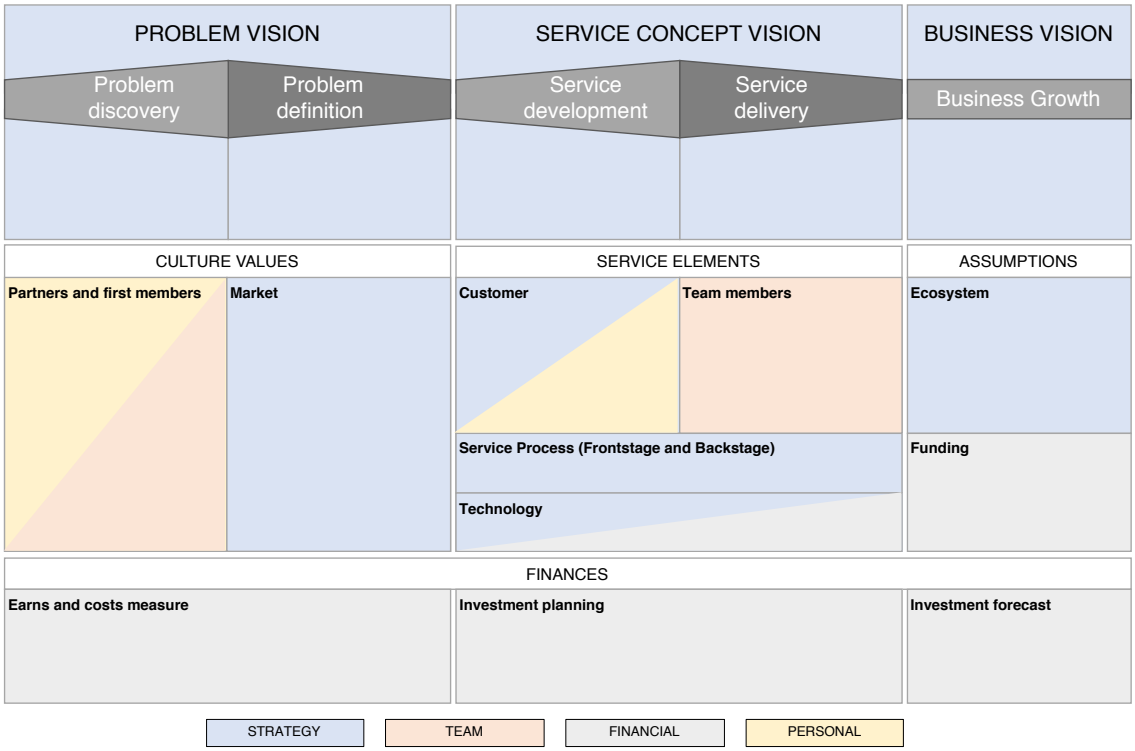

Figure 8: Challenges identified during interviews distributed on the Service Startup Model

Part of the results of the interviews was to identify relevant tools used by the interviewees, and in the same way that was done for the challenges, organize in groups by affinity and determine in which of the stages the interviewees were using these tools. In Table 9, it is possible to note the lack of tools at the beginning and end of the process relative to the stages of understanding the problem and structuring growth. However, even with a more significant number of tools in the intermediate stages, from Define to Deliver stages, it was possible to infer from the interviews a lack of connection between them relative to a service-oriented startup.

Table 9: Tools categories distributions on different Stages by codes in interviews

Tools	Discover	Define	Develop	Deliver	Growth
Search	0	7	3	2	1
Modeling	1	5	1	3	2
Validation	0	3	2	3	0
Communication	0	1	2	0	0
Others	0	1	1	2	0

As a result of the organization of the tools identified during the interviews, it was possible to associate the challenges and tools categories used by the interviewees through

the different Service Startup Model, as presented in Figure 9. The first layer, from Problem, Service Concept, and Business visions, are covered by all tools categories due to the strategic relevance of this section of information.

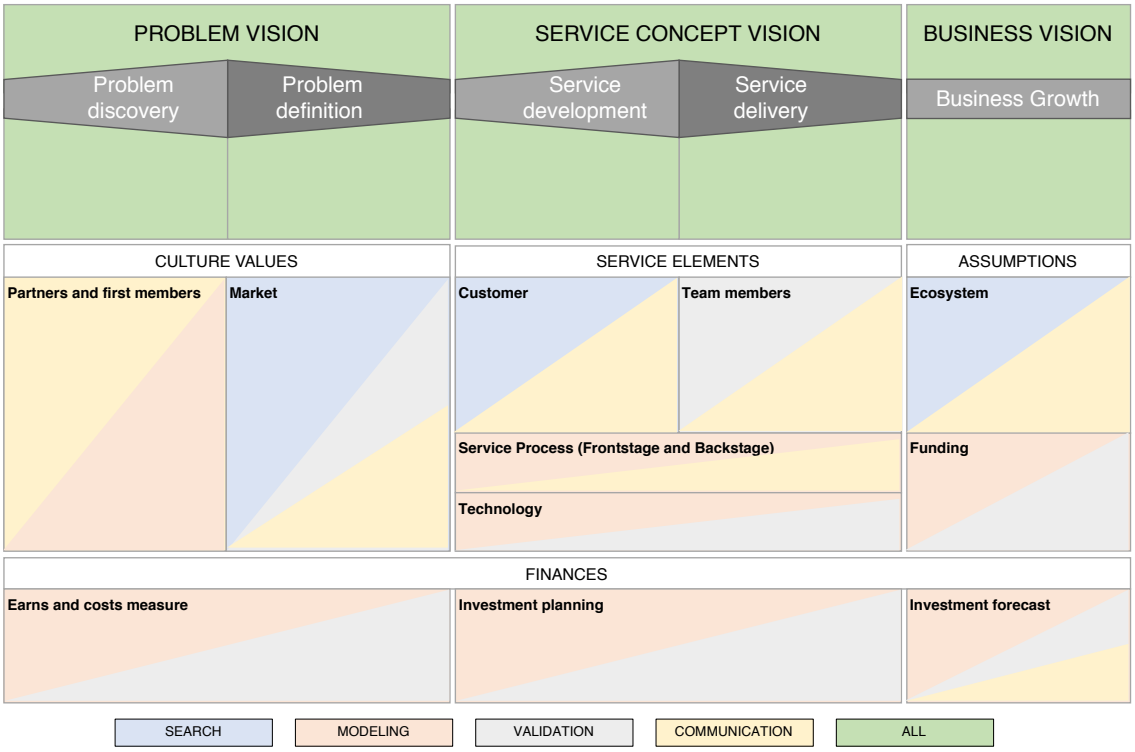

Figure 9: Tools categories identified during interviews distributed on the Service Startup Model

The Service Startup Model was designed in two main layers. Three blocks organize the first layer: Problem vision, Service concept vision, and Business vision, that must be defined, shared, and validated by internal stakeholder as strategical guidance to balance decisions. This first layer preserves the iterative process of the Double Diamond (British Design Council, 2007), focusing on questions to develop a service. The second layer is related to Structural components that are the foundation of the three visions in different moments. These blocks organize the second layer: Culture value, Resources, Assumptions, and Finances. Figure 10 represents the blocks of the first and second layers organized following a suggested order and the relationship between them.

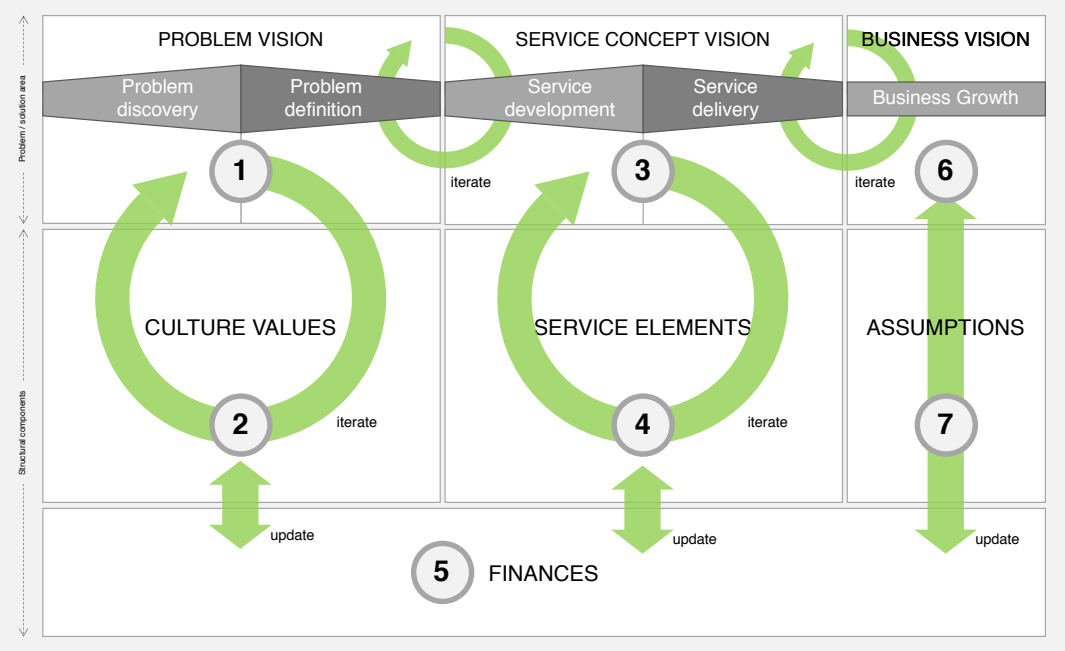

Figure 10: Service Startup Model main blocks and their interactions

The entire Service Startup Model is presented in Figure 11 and is filled with relevant questions for each block's perspective. The first layer is related to the Problem and Solution area, where visions are bridged into the diverging and converging aspects of Double Diamond (British Design Council, 2007) through an iterative process to understand the problem and design a relevant service and later a business. The second layer, the structural components, where business concepts (finances, resources, team, market, and assumptions) and the service backstage (Patrício *et al.*, 2011) components (customer, team, process, and technology) come together in the same context of the Service Startup Model. Each component block presents relevant questions to the entrepreneur solve; these questions came from the interviewees' perspective of each Challenge in different Stages and should be used not only in the respective Stage but constantly revisited by entrepreneurs when needed.

Problem vision

Located in the first layer of the Service Startup Model, the Problem vision is defined in two steps: Problem discovery, where it is necessary to investigate the problem context, collect information about what is wrong or could be improved, and how this is affecting people's life. The second step, the objective is to Problem definition, the definition of entrepreneurs understanding the problem and the point of view over it. The

suggestion is that after collecting questions about problem discovery and definition, all stakeholders could share the same Problem vision in a sentence or something similar.

Service concept vision

The second block of the first layer, the Service concept vision, is also defined in two steps, Service development, where is essential to make a clear transition from problem to a service that solves a problem, validate the aspects of this service, and identify not only the people related to the problem but identify the shared aspects of these people that could represent a target customer. Service delivery is about reaching the people who need the service, mapping early adopters, and creating a customer network that could spread the word. It is also essential to validate the service vision with the Problem vision and Culture values.

Business vision

The third block of the first layer is the Business vision, where entrepreneurs should consider why and how businesses should grow, the impact in the current vision and structure, and how success can be measured.

Culture values

The first block of the second layer, the Culture values are organized in two minor blocks, Partners and first members, where partners must identify, discuss and aligned peoples aspect about what is important to each partner individually, how this related to each other, what is negotiable and what is not and how this is the foundation of peoples values inside the service. Finally, the second minor block, Market, is about competitors, how they interact with the problem area, and how to identify external stakeholders.

Service Elements

Service Elements are related to handling and operating the service from the beginning until an operation is ready to scale. It is located in the second layer. It is organized into four minor blocks. The first is Customer, about the people's persona, the journey through the service, and expectations about how could the service be beneficial. Team members is the second minor block, cover questions to help manage team members, essential roles to the service, and the individual values of each team member. The third minor block, Process, identify repetitive tasks that could be described in a process to all

members to gain velocity and reduce costs or rework. Finally, the fourth minor block considers the Technology required to maintain and operate the service.

Assumptions

These are assumptions related to growing the business and scale, and It is organized in two minor blocks: Ecosystem, helps to understand who are the stakeholders that could help the business grow, what are the movements of competitors, and the impact of a growth strategy could cause in the actual structure of the service. Funding, the second minor block, considers the options available to fund the growth process, what the conditions are, and if these conditions are aligned with Culture values validated by partners.

Finances

Finances is the last block of structural components that relates to the impacts of strategy and decisions on budget and forecast. It is organized into three minor blocks connected with the stage moment (Problem discovery, Problem definition, Service Development, Service Delivery, and Business Growth). Earns and Costs Measure helps to understand if people are willing to pay for having the problem solved if it is a recurrent revenue, where it is needed to spend money to start to operate, and essential to identify partners' financial limit. The second minor block, Investment planning, highlight tests and measure to validate sales strategies and investments return and planning the budget to understand how long it will last. The third block, Investment forecast, is a reflection that entrepreneurs have about possible investments and where this investment should be placed to have the best return to business growth.

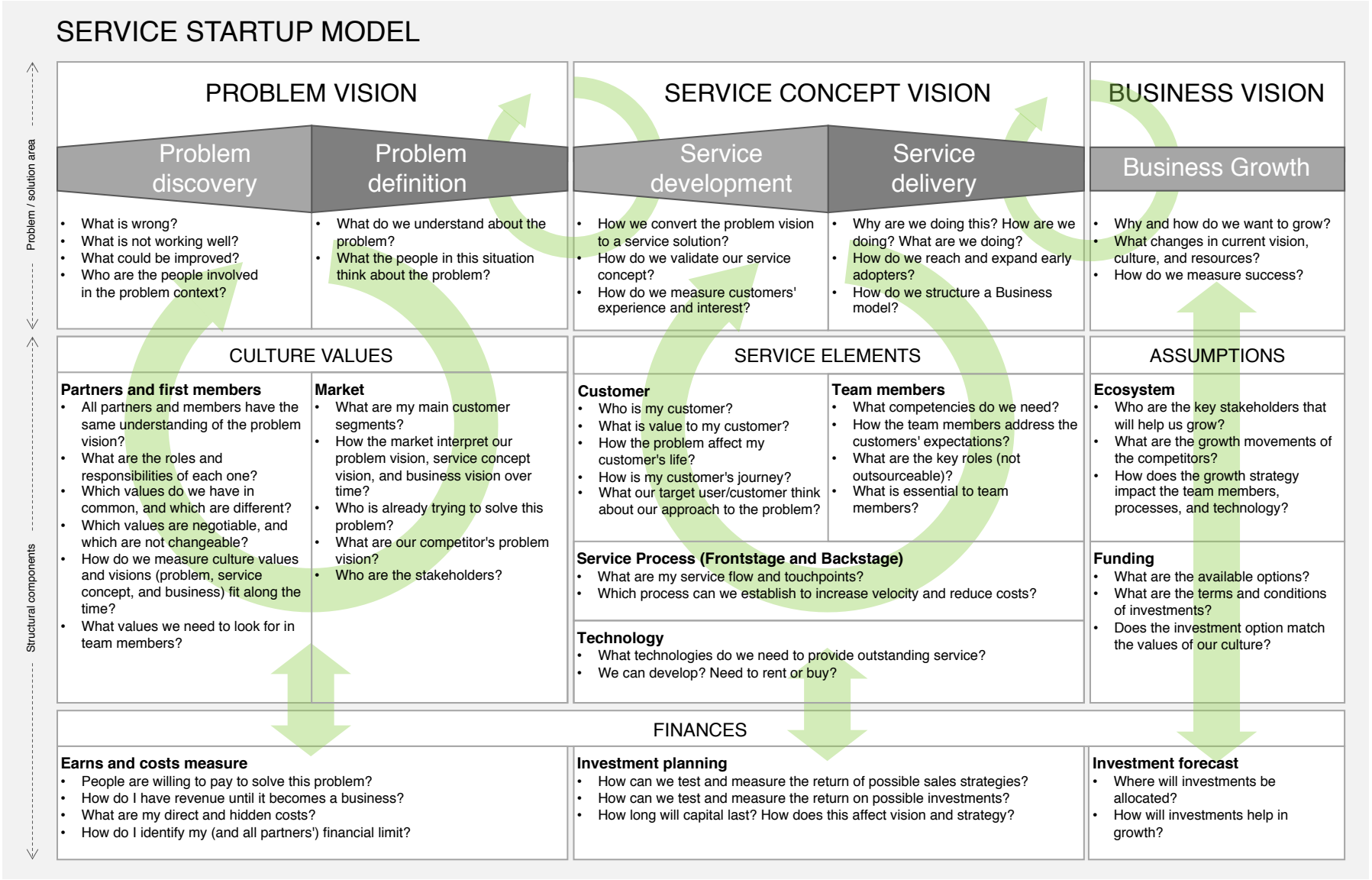

Figure 11: The Service Startup Model

5.3. Service Startup Model validation

The Service Startup Model introduced in this dissertation was the subject of validation, with five of the initial sixteen interviewed people for data collection. The validation was conducted over individual video calls between the 17th and 21st of May of 2021, with the presentation of the Service Startup Model and two open questions: "What did you like?" and "What would you improve or change?".

Regarding the "What did you like?" question, interviewees answered that the Service Startup Model organizes and presents all relevant information, including the vision to be shared between partners and team members to simplify the decision-making process. Concerning partners' vision about the problem, service, and growth, it was mentioned that most of the problems in the future between partners are related to a superficial conversation about these visions in a hurry to start doing things.

Considering the "What would you improve or change?" question, interviewees, answered they are more interested in applying a first time to check and give more detailed feedback. As a result, the opinions are more spread in different topics closer to the actual situation each one faces. Nevertheless, in general, the main points are to check the flow of filling the information to assure a good experience and check what topics need further exploration.

The Service Startup Model validation is summarized with all key mentions, organized in Table 10 by interview, and the two open questions about the Service Startup Model. One of interviewee (B) feedback, in Table 10, about making more evident the iterative component of the Service Startup Model was considered in Figure 11, as it was easy to implement. Other feedbacks will be considered for future research, as mentioned in Chapter 6 – Conclusions.

Table 10: Main points of Service Startup Model validation interviews

Interviewee	What did you like?	What would you improve or change?
A	• It has a constructive overview of the main topics of establishing a service and a business. • Being able to have a view on investments for growth in early stages. • A model with concern for cultural aspects facilitates the process of identifying and retaining talent.	• The growth block can be explored in the future and have its own model.
B	• To compare different aspects from problem understanding until the business, such as the problem, the idea, forming the team, and building the solution.	• Consider giving more emphasis to more critical and often overlooked points, such as purpose, team, and "smart money" (investment). • Make it more evident that the Service Startup Model use should be flexible and iteratively.
C	• The Service Startup Model is consistent with the reality of a startup and the stages of structuring a service. • It demonstrates a concern with growth and investment allocation. • The blocks related to vision, cultural values, and team are well connected. This connection is helpful when find and engage the right people.	• I believe that the blocks related to people deserve more emphasis because it is a crucial aspect of services and often neglected. • I want to put it into practice before giving more opinions.
D	• The Service Startup Model presents the business and service needs in an integrated and holistic way. It is concise and clear. • The presented structure describes fundamental elements that will be the basis of a medium or large company in the future.	• Organize the implantation in parts because the lack of information can cause anxiety in the entrepreneur. • I want to implant myself in a business that I am starting to give more in-depth feedback.
E	• The Service Startup Model promotes reflection in the entrepreneur at the start and in the structuring of the business. • This reflection on the Service Startup Model is necessary for partners' alignment on the solution and the business goals. • The Service Startup Model can be combined with existing tools.	• It may be necessary to put it into practice to assess how agile it is to run and which points need more or less emphasis.

Chapter 6 – Conclusions

The Service Startup Model offers a structured way for entrepreneurs to take advantage of service design and startup modeling concepts combined with an overview of principal challenges in iterative stages. In addition, the Service Startup Model provides a structure where entrepreneurs could organize perceptible and imperceptible components of structuring a service startup.

During the research process through the environment context, it was possible to identify that startup businesses typically were born from a need or an inspiration. However, they are unstructured and not well discussed due to anxiety to make something reach the market. At the same time, some services are born from an observation not validated with real people.

Most interviewees suggested that the anxiety about bringing the service to the market typically comes with future problems. These problems could be a different interpretation of the problem vision and solution vision from founder partners, lack of arguments to decide the best moment to pivot, and difficulty identifying an accurate market fit. Some interviewees also suggested the difficulty to understand and organize the service and business operations due to limited resources, which impact the dedicated time and attention to strategy. These insights were relevant to structure crucial questions to entrepreneurs on each Service Startup Model block, bridging the environment context to the model.

The relevance to the environment is a critical aspect to the Service Startup Model, this relevance interviewees' feedback about the Service Startup Model, such as the consistency with the service startups reality, the integrated view presented, and the possibility of combining it with existing tools.

Through the knowledge base contribution, a few gaps were identified. Such as, Service Design does not consider questions about business development and entrepreneurship. In that way, the Service Startup Model connects those two perspectives (Service Design and Entrepreneurship) in a single model, covering the main aspects of Human Centered-Design (IDEO, 2009) for customers, service users, partners, and team members. Additionally, extend the business concept from entrepreneurship to develop a business around this new service.

In the same way, the Entrepreneurship knowledge base has little reference for service aspects. For example, the Business Model Canvas (Osterwalder and Pigneur, 2013) and the Lean Startup (Ries, 2011) consider the general elements of a business, not distinguishing products from services. This generalization makes it difficult for entrepreneurs to manage uncovered areas about a service startup, such as touchpoints, frontstage and backstage of service, and continuous operation of a service in contact with customers, differently from hardware or product development, where once it is completed, is shipped to the customer.

However, this study has limitations in collecting and organizing knowledge base and environmental conditions. First, this research was conducted with Portuguese and Brazilian entrepreneurs in Portugal and Brazil, which means that cultural and economic aspects could influence these results. This limitation could be overcomed by extending this study to other countries following the same interviewee profile. Second, the results considered a broad business area, including financial, education, pet retail, communications, and others. Therefore, this study could be complemented by collecting further details in different markets to identify specific needs and challenges. Third, during this research, it was not possible to implement the Service Startup Model and evaluate its outcomes in a real-world situation. Therefore, this study could significantly evolve after implementing interviewees' feedback, evaluating the Service Startup Model results, collecting feedback, and improving outcomes.

Finally, the Service Startup Model connects the knowledge available from Service Design and Entrepreneurship. It brings depth to the discussion of these two topics, bringing a path to entrepreneurs to understand opportunities and problems, design services, and build businesses to solve these problems. Hopefully, this research could stimulate more researchers to test and improve the Service Startup Model or other models that may help entrepreneurs establish better businesses and people have better services.

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8. Annexes

Annex I: Interview script

Original Version (Portuguese)

Guião da Entrevista Geral

Abertura: apresentação do entrevistador

Introdução à proposta da entrevista

Dados Sociodemográficos:

1. Idade
2. Género
3. Grau de escolaridade
4. Perfil (cargo na empresa) – empreendedor, consultor e designer
5. Tempo de experiência
6. Localização atual (cidade / país)
7. Situação atual
8. Estágio de desenvolvimento da startup
9. Quantos anos no mercado
10. Ramo de atividades

Perguntas:

1. Já esteve envolvido no processo de desenvolvimento de uma *startup* ou de um novo serviço? Como foi sua experiência?
    a. Qual foi o seu papel nesse processo?
    b. Quais foram as etapas por que passou?
    c. O que correu bem?
    d. Quais foram as principais dificuldades encontradas no início?
    e. Quem foram os stakeholders mais importantes?
2. Como foi concebido o serviço?
    a. Utilizou alguma ferramenta para ajudar nesse processo?

b. Como foi o processo de validação da sua oferta com clientes? Utilizou alguma ferramenta para ajudar nesse processo?
c. O que foi fundamental para o desenho da oferta?
d. O que acha que faltou durante esse processo de desenho e validação da oferta? O que teria feito diferente?

3. Pitch de apresentação da proposta de solução

   Agradecimentos, encerramento e convite para próximas interações.

Translated Version

General Interview Guide

Opening: presentation of the interviewer

Introduction to the interview proposal

Sociodemographic Data:

1. Age
2. Gender
3. Level of schooling
4. Profile (position in the company) - entrepreneur, consultant, and designer
5. Length of experience
6. Current location (city / country)
7. Current situation
8. Stage of development of the startup
9. How many years in the market
10. Area of activity

Questions:

1. Have you ever been involved in the development process of a startup or a new service? How was your experience?
    a. What was your role in that process?
    b. What were the stages you went through?
    c. What went well?
    d. What were the main difficulties encountered at the beginning?
    e. Who were the most important stakeholders?
2. How was the service conceived?
    f. What do you believe is critical to the design of the offering?
    g. What do you think entrepreneurs usually forget during this process?
3. Pitch presentation of the solution proposal

Acknowledgments, closing and invitation for further interactions.

Annex II: Interview codebook

Table 11: Codes generated during the process of interview analysis

Name	Files	References
Challenges	16	189
Challenges\Financial	9	32
Challenges\Financial\Financial planning	6	16
Challenges\Financial\Financial planning\Discounts in the beginning	1	1
Challenges\Financial\Financial planning\Growth and costs	3	5
Challenges\Financial\Financial planning\Wrong investments	2	4
Challenges\Financial\Lack of resources	5	15
Challenges\Financial\Lack of resources\Lack of investors	2	3
Challenges\Financial\Others	1	1
Challenges\Financial\Others\Cyber-security investment	1	1
Challenges\Personal	9	47
Challenges\Personal\Keep the motivation	4	17
Challenges\Personal\Keep the motivation\Fall in love by the idea	1	1
Challenges\Personal\Personal life and Business	5	26
Challenges\Personal\Personal life and Business\Be an authority in the subject	1	1
Challenges\Personal\Personal life and Business\Create the own business by a need	1	2
Challenges\Personal\Personal life and Business\Leave local market to get accelerated	1	1
Challenges\Personal\Personal life and Business\Part-time dedication	1	1
Challenges\Personal\Personal life and Business\Psychological support is important	1	1
Challenges\Personal\Working solo	4	4
Challenges\Strategic	16	77
Challenges\Strategic\Market knowledge	11	37
Challenges\Strategic\Market knowledge\Constant track of customer satisfaction	1	2
Challenges\Strategic\Market knowledge\Develop a solution no one wants	3	3
Challenges\Strategic\Market knowledge\Have a network to grow the business	2	2
Challenges\Strategic\Market knowledge\Market fit	3	5
Challenges\Strategic\Market knowledge\Market resistance in adoption	1	1
Challenges\Strategic\Market knowledge\Understand the problem	4	8
Challenges\Strategic\Market knowledge\Unknowing the market	3	5
Challenges\Strategic\Market knowledge\Validate assumptions with customers	8	11
Challenges\Strategic\Objectives and vision	8	16
Challenges\Strategic\Objectives and vision\Have an action plan timeline	1	1
Challenges\Strategic\Objectives and vision\Internal censorship	1	1
Challenges\Strategic\Objectives and vision\Lack of focus on purpose	3	5
Challenges\Strategic\Objectives and vision\Lack of strategic objectives	3	4
Challenges\Strategic\Objectives and vision\Lack of strategic vision	2	2
Challenges\Strategic\Objectives and vision\Product portfolio dispersion	2	3
Challenges\Strategic\Process and technology	13	24
Challenges\Strategic\Process and technology\Communication plan	1	2
Challenges\Strategic\Process and technology\Dedicate time to ideation phase	1	3

Challenges\Strategic\Process and technology\Establish process	5	7
Challenges\Strategic\Process and technology\From idea to operations	1	1
Challenges\Strategic\Process and technology\New technologies	2	2
Challenges\Strategic\Process and technology\No site is better than bad site	1	1
Challenges\Strategic\Process and technology\Outsourcing development	3	5
Challenges\Strategic\Process and technology\Reinvent the business every day	1	1
Challenges\Strategic\Process and technology\Sooner you test, more time to fix you have	1	1
Challenges\Strategic\Process and technology\Time consuming in operations	1	1
Challenges\Team	12	33
Challenges\Team\Culture development	6	11
Challenges\Team\Culture development\Culture development	5	8
Challenges\Team\Culture development\Engagement	2	3
Challenges\Team\Partners relationship	5	9
Challenges\Team\Right roles to hire	6	13
Challenges\Team\Right roles to hire\Don't want to do all alone	2	2
Challenges\Team\Right roles to hire\Lack of main roles in the team	2	3
Challenges\Team\Right roles to hire\Talents recruitment and retention	4	8
Main stakeholders	16	94
Main stakeholders\Accelerators and incubators	3	5
Main stakeholders\Collaborators	5	8
Main stakeholders\Consultants	2	2
Main stakeholders\Customers	8	12
Main stakeholders\Ecosystem	1	1
Main stakeholders\Family	2	2
Main stakeholders\Friends	2	6
Main stakeholders\Government	2	2
Main stakeholders\Investors	4	4
Main stakeholders\Mentors	3	4
Main stakeholders\Other entrepreneurs	3	9
Main stakeholders\Partners	6	6
Main stakeholders\Regulatory agencies	1	1
Main stakeholders\Suppliers	4	5
Main stakeholders\Universities	2	3
Stages	16	386
Stages\1 - Discover (Business Insight)	10	29
Stages\1 - Discover (Business Insight)\Having the business insight	6	16
Stages\1 - Discover (Business Insight)\Idea birth	8	13
Stages\2 - Define (Validating the problem)	16	110
Stages\2 - Define (Validating the problem)\Identify customer needs	14	61
Stages\2 - Define (Validating the problem)\Identify market opportunities	13	49
Stages\3 - Develop (Structuring the business and service)	16	146
Stages\3 - Develop (Structuring the business and service)\Building the team	11	38
Stages\3 - Develop (Structuring the business and service)\Identify technological requirements	4	7
Stages\3 - Develop (Structuring the business and service)\Validate the idea	14	101

Stages\4 - Deliver (Validating solution)	13	82
Stages\4 - Deliver (Validating solution)\Prototype	13	81
Stages\5 - Growth	9	18
Stages\5 - Growth\Business funding	2	8
Stages\5 - Growth\Business growth	7	10
Tools	16	67
Tools\Communication	3	3
Tools\Communication\Customers message groups	3	3
Tools\Modeling	9	28
Tools\Modeling\Backlog Agile	1	1
Tools\Modeling\Business model generation	4	4
Tools\Modeling\Customer journey	4	5
Tools\Modeling\ExO Canvas	1	1
Tools\Modeling\Golden Circle	1	1
Tools\Modeling\Growth Hacking	2	2
Tools\Modeling\OKR	1	1
Tools\Modeling\Persona	3	3
Tools\Modeling\Service blueprint	1	2
Tools\Modeling\Six Hat Thinking	1	1
Tools\Modeling\SWOT	1	1
Tools\Modeling\Value proposition design	4	6
Tools\Others	4	5
Tools\Others\Design Sprint	2	2
Tools\Others\Lean startup	2	2
Tools\Others\Service design	1	1
Tools\Search	10	17
Tools\Search\Ecosystem map	3	3
Tools\Search\Interviews	4	5
Tools\Search\Market research	3	3
Tools\Search\Online forms	6	6
Tools\Validation	5	12
Tools\Validation\Mockup	3	6
Tools\Validation\MVP	3	4
Tools\Validation\UX design	2	2