Agile Business Model Innovation in Digital Entrepreneurship: Lean Startup Approaches

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ABSTRACT

Digital startups in the early stages of their development frequently undergo innovation to their value architecture and Business Model. A set of pragmatic methods drawing on lean and agile principles has recently been proposed to support digital entrepreneurs facing Business Model Innovation (BMI), known as Lean Startup Approaches (LSAs). However, the theoretical and practical relationship between BMI and LSAs in dynamic digital environments has seldom been investigated. To fill this gap, our study draws on an exploratory multiple-case study based on three digital multisided platform startups to craft a unified framework that can disclose the relationship between BMI, LSAs and Agile Development (AD), within the context of Strategic Agility. Our findings, which emerge from the unified framework, show that LSAs can be employed as agile methods to enable Business Model Innovation in Digital Entrepreneurship. These findings are then organized around a set of propositions, with the aim of developing a research agenda directed towards integrating BMI, LSAs and AD processes and methods.

1. Introduction

In the early stages of their development, new ventures and startups frequently undergo change and innovation (McDougall & Oviatt, 1996), because of their need to tackle resource scarcity and align their internal acquired resources to the external conditions (Hanlon & Saunders, 2007; Katila & Shane, 2005). This is particularly true for startups operating in a dynamic and uncertain digital context (Courtney, Kirkland, & Viguerie, 1997; Sirmon, Hitt, & Ireland, 2007), where the impact of pervasive and multipurpose digital technologies increases the pace of change, leading to significant transformations in a number of industries (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Ghezzi, Cortimiglia, & Frank, 2015; Kalakota & Robinson, 1999).

Within such a dynamic context, innovating is an intricate exercise that demands idiosyncratic and seemingly divergent approaches and tools which digital startups can select as required, depending on the direction they intend to take when embarking upon their innovation process.

We argue that the theoretical and practical relationship between these approaches and tools is worth investigating, and should specifically examine the way in which early stage digital startups innovate their business model by leveraging on emerging agile and lean practices.

Innovation in early stage digital startups moves along two different albeit intertwined paths: (i) innovation necessary to modify and adapt their products, services and value proposition to changing internal and/or market conditions - and mostly refers to the process of New Product Development (NPD) (Brown & Eisenhardt, 1995; Krishnan & Ulrich, 2001); and (ii) innovation to their business model - i.e. the overall value architecture and related mechanisms they set around their value proposition to generate value for target customers, place such value on the market and retain part of it to ensure economic and financial viability (Rappa, 2001; Teece, 2010; Timmers, 1998; Weill & Vitale, 2013).

This second path expands the concept of NPD to embrace the fragmented but rapidly growing research stream and practice on Business Model Innovation (BMI) (Schneider & Spieth, 2013; Teece, 2010; Zott, Amit, & Massa, 2011), referred to as the design and introduction of "novel, non-trivial changes to the key elements of a firm's business model and/or the architecture linking these elements" (Foss and Saebi, 2018, p. 201). Although NPD and BMI research streams and practices should inherently be related, so far they have evolved in a largely disconnected fashion.

In their path to bring about product, service and value proposition innovation, startups operating in this digital age can exploit a number of approaches that fall under the domain of agile methods. Within this group, Agile Development (AD) refers to practices for software development based on the centrality of individuals and interaction, incremental delivery of working software, collaboration with customers and

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response to change (e.g. see Beck et al., 2001; Senapathi & Srinivasan, 2012; Rigby, Sutherland, & Takeuchi, 2016; Cram & Newell, 2016; Paluch et al., 2017).

With reference to the second path, the question of how to innovate a digital startup's overall business model - which includes and complements its value proposition (Osterwalder & Pigneur, 2010; Teece, 2010) - was recently tackled through a set of pragmatic approaches referred to as the Lean Startup (Ries, 2011) and Customer Development (Blank, 2013). Both of these Lean Startup Approaches (LSAs) were conceived as a means to support entrepreneurs in the process of validating and innovating their business model (Trimi & Berbegal-Mirabent, 2012) through market tests and early customer feedback, thus triggering a process known as the "build-measure-learn" loop (Blank, 2013; Ries, 2011). Despite being wide-spread throughout the entrepreneurial community (Maurya, 2012; Yang, Sun, & Zhao, 2018), LSAs' academic relevance and soundness is still met with scepticism among scholars. As a result, there is as yet no strong theoretical foundation for these approaches in the literature, although it would be of great help for accumulating knowledge in the field.

With reference to the theoretical underpinnings and antecedents, Ries (2011) and Blank (2013) clearly connect LSAs with "lean philosophy" - and its first application in the manufacturing world (Womack & Jones, 1997) - by defining LSAs as a startup's attempts to cut its waste, understood as all its operations and processes which the target customer does not want or does not ask for (Blank, 2013; Ries, 2011); however, such connection has never been deeply or thoroughly investigated.

A similar problem emerges concerning the relationship between LSAs and Agile Development methods, where this link, despite potentially being intuitive (Blank, 2013), is seldom elaborated on further. Extant research in the manufacturing field proposes a "leagile" method that crosses agile with lean philosophies (e.g. see Naylor, Naim, & Berry, 1999; Mason-Jones, Naylor, & Towill, 2000; Agarwal, Shankar, & Tiwari, 2006), although this discussion does not touch upon LSAs - probably because of the recent and as yet non-systematic application of these principles to the domains of strategy, entrepreneurship and innovation.

Moreover, while there appears to be an explicit link between the process of iteration carried out on the business model components and mechanisms set out in LSAs and the process of Business Model Innovation, this relationship is seldom recognized within the relatively fragmented literature on BMI, which still suffers from paradigmatic problems (Foss & Saebi, 2018; Zott et al., 2011).

The proliferation of different practices that can possibly help entrepreneurs in their innovation endeavors, together with the substantial lack of a clear and unified theory backing such practices, together contribute towards creating a rather confusing setting that amplifies the problems that startups are already having to face, thus jeopardizing their quest for survival.

These considerations are even more relevant in the context of digital entrepreneurial ecosystems (Cavallo, Ghezzi, & Balocco, 2018; Nambisan, 2017), where digital startups have to cope with environmental dynamism that either forces them to adapt their business model to the volatile environment in which they operate, or offers them the chance to innovate their business model and so trigger more dynamic phenomena (Downes & Nunes, 2013).

This study aims at positioning our contribution at the crossroads of the above discussions and gaps in theory and practice, by exploring how LSAs act as agile methods for Business Model Innovation in Digital Entrepreneurship.

To this end, we will design an exploratory multiple case study based on three digital startups, using it to investigate: (i) whether and how BMI carried out by early stage digital multisided platform startups in moderately or highly dynamic environments is related to LSAs and AD; and (ii) whether and how the focus of BMI processes - in terms of its steps and constituent elements - changes when considering a moderately dynamic environment (Case A) or a highly dynamic environment in which the digital startup operates (Case B), or a highly dynamic environment determined by the digital startup itself (Case C).

Our study will contribute to both theory and practice in a number of ways. First, we found that LSAs are tightly connected to agile methods and, as a result, we claim that LSAs can be understood as a form of Agile Development applied to products, services, value propositions *and* whole business models. This argument adds to the open debate currently questioning the range of application for agile practices in business and management (Cooper & Sommer, 2016). Second, according to our reasoning, LSAs are agile methods for Business Model Innovation, and therefore the theoretical foundations of LSAs are grounded in the BMI field. Third, we have developed a unified framework and set of propositions that connect Business Model Innovation, Lean Startup Approaches and Agile Development and position this relationship within the context of Strategic Agility. Fourth, concerning practice, digital entrepreneurs may find our framework and propositions useful while designing and innovating their business models under varying conditions of environmental dynamism and with the startup taking on different roles when confronting or determining these conditions.

The remainder of the study is organized as follows. In Section 2, we illustrate the theoretical background at the basis of our investigation. In Section 3, we describe the research design and the cases, then presented in Section 4; and in Sections 5 and 6 we show and discuss the results of our empirical analysis. Finally, in Section 7, we draw the conclusions, opening the avenues for further research.

2. Theory

2.1. Business Model Innovation

The research stream of Business Models and Business Model Innovation (BMI) springs from a combination of various Strategic Management theories, such as transaction cost economics, resource-based views of a firm, system theory and strategic network theory (Amit & Zott, 2001; Hedman & Kalling, 2001; Morris, Schindehutte, & Allen, 2005).

The business model, both as a concept and a related construct, has largely referred to the value architecture of a business (Foss & Saebi, 2018; Rappa, 2001; Teece, 2010; Timmers, 1998; Weill & Vitale, 2013), that is, how the firm creates value, delivers this value to its customers and entices them to pay, eventually converting these payments to profit (Teece, 2010). BMI, by contrast, deals with "designed, novel, non-trivial changes to the key elements of a firm's business model and/or the architecture linking these elements" (Foss and Saebi, 2018, p. 201).

Notwithstanding the great emphasis that the literature has recently placed on developing an understanding of Business Models and their innovation (Zott et al., 2011), this research stream and the associated practice both still suffer from a severe lack of homogeneity, clarity and direction (Ghezzi, 2013; Johnson, Christensen, & Kagermann, 2008; Wirtz, Pistoia, Ullrich, & Göttel, 2016).

Massa, Tucci and Afuah recently tackled this controversial state in the current academic debate (2016), finding that, beyond the traditional interpretation whereby business models are seen as formal conceptual representations of how a business is structured and functions - i.e. a firm's value architecture -, two further perspectives have emerged from the management literature: (i) business models as attributes of real firms; and (ii) business models as cognitive/linguistic schemas.

This fragmentation has led scholars to debate whether defining business models and BMI is actually a "wicked" problem - a problem so poorly defined and structured that inquiry appears hopeless (Buchanan, 1992). Foss and Saebi (2018) eventually argued that, instead of being a wicked problem, what burdens business models and BMI research is rather a "paradigmatic" issue, where a lack of construct clarity, little agreement about definitions and the difficulty in finding the dimensions for assessing core constructs together currently limit cumulative theory

from being built and tested. In an attempt to solve this issue, Foss and Saebi (2018) proposed that business models and BMI should be assessed in terms of the architecture of the firm's value creation, delivery and capture mechanisms - in line with Teece (2010).

The definition and assessment of business models and their innovation process has become a topic of paramount importance in the fields of strategy, innovation and entrepreneurship, because a growing number of scholars and practitioners agree that well-established companies and startups should now look beyond their isolated product, service or process innovation and focus instead on innovating their entire business model, which becomes the new unit of analysis for innovation efforts (Chesbrough, 2007, 2010; Lindgardt, Reeves, Stalk, & Deimler, 2009).

BMI involves innovation to at least one of the foundational elements of value creation, delivery and capture, and thereby gives a firm the potential to activate overlooked value sources within the company or create news systems that are difficult to imitate (Amit & Zott, 2012).

To date, the literature contains notable contributions and evidence on successful examples of Business Model Innovation processes relating mainly to large organizations (Amit & Zott, 2012; Chesbrough, 2007; Johnson et al., 2008; Schaltegger, Lüdeke-Freund, & Hansen, 2012; Sosna, Trevinyo-Rodríguez, & Velamuri, 2010), although BMI also refers to smaller organizations and startups (Klewitz & Hansen, 2014). More importantly, scholars and practitioners alike are calling for the development of practical tools and approaches to support Business Model Innovation (e.g. Foss & Saebi, 2018; Trimi & Berbegal-Mirabent, 2012). In line with this concluding remark, we will argue that Lean Startup Approaches should be interpreted as a first - albeit still mostly unrecognized - attempt to fill this gap.

2.2. Lean Startup Approaches

"Lean philosophy" and its principles originated in the manufacturing world (Hines, Holweg, & Rich, 2004; Womack & Jones, 1997) after the end of the Second World War, as a result of customers' needs evolving towards higher value in combination with companies' increasingly diverse offer. This significant redirection of production systems towards customer value is summarized in the "five principles of lean" described below (Womack & Jones, 1997):

1. *Create value for the customer*. Value is created when internal waste decreases and so costs are reduced, and is increased by offering new services and/or functions valued by the customer.
2. *Identify the value stream*. The concept of value stream must not hide behind a wall of obscurity. The costs of every firm must be transparent to all supply chain partners.
3. *Create flow*. The principle of creating flow has the aim of avoiding any stoppage in the value stream by preventing the main causes of such stoppages (i.e. changes in production, breakdowns, incorrect batches in terms of quantity or timing, lack of necessary information and re-entrant loops).
4. *Produce only what is pulled by the customer*. This principle implies high responsiveness while producing the highest quality products in an efficient and valuable way. The production pull is extended uphill to the suppliers and the whole upstream supply chain.
5. *Pursue perfection* by continuously identifying and eliminating waste.

As emerges from these principles, lean can be defined as a customer and value-centric approach to creating a flow of activities that continuously generate customer value by eliminating non-value-adding activities or "waste" (Feld, 2000; Liker, 1997; Womack & Jones, 1997).

While the lean philosophy arose in the manufacturing field, recent attempts were made to extend its application and impact to neighbouring areas. For instance, Reinertsen and Shaeffer (2005) showed that, if carefully implemented, this philosophy can enhance R&D results and psychological motivation during exploration operations.

Similarly, Ries (2011) and Blank (2013) made an attempt to adapt and combine the lean philosophy and its principles to the startups' development area by elaborating "Lean Startup" and "Customer Development" methods - which we have grouped under the title of Lean Startup Approaches (LSAs).

Borrowing from the overall definition of lean, LSAs are defined as the startup's attempt to cut its own waste, understood as all the activities and processes which the target customer does not want or does not ask for (Blank, 2013; Ries, 2011).

LSAs consist of a scientific, hypothesis-driven approach to entrepreneurship, where entrepreneurs translate their vision - i.e. business idea - into falsifiable hypotheses which are embedded in a first version of a business model. These hypotheses are then tested through a series of minimum viable products (MVPs), which are "the smallest set of activities needed to disprove a hypothesis" (Eisenmann et al. 2012 - p. 2). In line with the scientific method, hypotheses testing is performed through experiments that involve "evangelists", that is, expert prospects who can provide informed and useful feedback to the startup. Directly involving evangelists to test ideas and MVPs - rather than basing ones' evaluations merely on secondary data or "desk research" - is a clear illustration of the "get out of the building" approach advocated by Blank (2013).

On the basis of the test outcomes, entrepreneurs are faced with three main options: (i) persevere with their proposed business model - if the hypotheses are proven to be right; (ii) modify or pivot to a revised business model, where the business models parameters confirmed by the tests are retained and the others are improved on; (iii) or perish, that is, drop the business idea and, in turn, the startup that was to have been launched around it. The process is iterated until all key hypotheses are confirmed or validated through MVP tests. When this condition is reached, the startup has achieved its "product-market fit" (Eisenmann et al., 2012), which means that the value proposition designed and iteratively revised by the startup actually satisfies the needs of its target customers.

Product-market fit hence represents the successful conclusion of the "build-measure-learn" loop, where the startup builds an MVP and associated tests, measures the test results and customer feedback and learns how to change its business idea and business model accordingly.

In a similar vein, Blank and Dorf's (2012) and Blank's (2013) Customer Development holds that entrepreneurs are first called to "search" for a scalable and replicable business model along the stages of customer discovery - i.e. identification of evangelists - and validation - i.e. experimenting and testing. This search is followed by the execution phase, where the startups consolidates and scales up their business validation model through customer creation - i.e. marketing spending - and company building - i.e. the structuring of organizational teams, functions and units.

2.3. Agile development

According to Qumer and Henderson-Sellers (2006), agility is the ability to accommodate and adapt to changes in a dynamic environment. Being agile means applying previous knowledge while learning from current experience in order to deliver high-quality products, under budget constraints and in short time frames (Jyothi & Rao, 2012). Agility hence encompasses the features of flexibility, velocity, learning and response to change and leanness (Campanelli & Parreiras, 2015; Conboy & Fitzgerald, 2004).

Agile Development refers to a number of agility-enabling practices for software development (Jalali & Wohlin, 2010; Lee & Yong, 2013) that value the centrality of individuals and interaction, the incremental delivery of working software, collaboration with customers and response to change (e.g. Beck et al., 2001; Cram & Newell, 2016; Paluch et al., 2017; Rigby et al., 2016; Senapathi & Srinivasan, 2012). Campanelli and Parreiras (2015) recently carried out a survey on AD methods, finding that the most widely used methods are Extreme

Programming, Scrum, Kanban, Lean, Feature-Driven Development, Dynamic Systems Development Method, Adaptive Software Development, Crystal and Rational Unified Process. These lists indicate that, in the extant literature, it is nothing new or indeed surprising for a lean practice to be also considered an agile practice. For instance, the Kanban system - a popular lean tool created to manage manufacturing operations (Ikonen, Kettunen, Oza, & Abrahamsson, 2010) - has also been applied to software development, and is therefore included among the agile methods (Campanelli & Parreiras, 2015). Similarly, Barton (2009) argues that Scrum uses a lean "pull" technique to smooth the flow of the system. It follows that, although agile and lean are considered to be distinct concepts (e.g. Hallgren & Olhager, 2009), scholars agree that agility includes "leanness" as one of its most important attributes (Conboy & Fitzgerald, 2004). In the supply chain and in software development fields, this recognized integration has led to the proposal of a combined lean and agile practice, called "leagile" (Mason-Jones et al., 2000; Naylor et al., 1999; Wang, Conboy, & Cawley, 2012).

In a similar vein to lean, agile methods are associated to a common "philosophy", where the main values and principles of focus are: (i) individuals and interaction; (ii) working software; (iii) customer collaboration; and (iv) responding to change (Campanelli & Parreiras, 2015).

Although such overarching values and principles typically have a high level of abstraction, they were put forward by experienced practitioners (Beck et al., 2001), who later worked to embed them into the AD methods employed today. The benefits for practice stemming from the application of AD methods have been widely recognized (Cram & Newell, 2016; De Cesare, Lycett, Macredie, Patel, & Paul, 2010). AD methods are meant to take dynamism and uncertainty into fair account within the product innovation process, by including iterations, feedback-feedforward cycles and intense testing procedures that depart significantly from a well-structured - although often rigid plan-based - Stage-Gate approach (Cooper, 2008). The Stage-Gate approach emphasizes the crucial importance of extremely detailed upfront planning, to avoid wasting resources later during the execution and maintenance phases (Cooper, 1990). Change is, therefore, perceived as something to possibly limit, and every step ahead is the result of a top down decision (Sommer, Hedegaard, Dukovska-Popovska, & Steger-Jensen, 2015). This point reveals that a pure Stage-Gate approach is most likely unsuitable in dynamic environments where change seems necessary on a regular basis. Conversely, Agile Development practices involve multiple short plan-execution cycles governed by customer feedback and rapid change (Beck et al., 2001; Wang et al., 2012). A minimum amount of upfront planning and customer involvement in the development process are key elements in agile practices (Wang et al., 2012).

As well as the wide-spread adoption of agile methods and practices, scholars also highlight their possible shortcomings, such as deployment difficulties, sometimes ambiguous benefits and the lack of project ownership and accountability (Balijepally, Mahapatra, Nerur, & Price, 2009; Cram & Newell, 2016; Drury, Conboy, & Power, 2012; Janes & Succi, 2012; Laanti, Salo, & Abrahamsson, 2011). A recent study by Conboy and Fitzgerald (2010) also sheds light on the need for organizations to customize AD methods to find their own version, the one that best fits their specific challenges and objectives, all of which makes the method application less straightforward than commonly expected.

Moreover, a current debate in business research is questioning the range of application for agile methods. Agile works well when handling complex problems that can be broken down into distinct modules where iterations are feasible and mistakes are a chance to learn - rather than something to be necessarily avoided (Rigby et al., 2016). Complex products with limited modularity may, instead, require a Stage-Gate, plan-based approach or a hybrid agile and Stage-Gate model, as suggested by Cooper and Sommer (2016). This latter remark brings up another question and related gap in literature concerning the suitability of agile for validating and innovating a whole business model built around a product, service or value proposition. To date, few studies

follow this promising research direction: however, since the business model is considered to be a complex and modular system of value (Massa, Tucci, & Afuah, 2016), the opportunity of applying forms of agile and AD when innovating a BM - understood as a modular object or system - is worth investigating. We will argue that the LSAs are the emerging form of a BMI-supporting AD.

3. Material and methods

This research has been designed as an exploratory multiple case study (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 1984). A case study is an "empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1984 - p. 23).

Within our multiple case study, we have examined the early stage Business Model Innovation process undertaken by three different digital multisided platform startups in real-life contexts that vary in terms of environmental dynamism - moderate or high - and the relative role played by the startup - which can be subject to or instead determine this dynamism. Following Van Maanen (1979) and Clark, Gioia, Ketchen Jr., and Thomas (2010), we selected an interpretive research approach, which "gives voice in the interpretation of events in a first-order analysis to the people actually experiencing those events" (Clark et al., 2010 - p. 403). We then formulated a second order interpretation of the informants' voices which referred to - but was not limited to - Business Model Innovation theory, possibly contributing to theory building.

Although exploratory theory building research should start with little or no theory under consideration and no hypotheses to test - since "preordained theoretical perspectives or propositions may bias and limit the findings" - according to Eisenhardt (1989 - p. 536), it is virtually impossible to start with a "clear theoretical slate". Nonetheless, in an attempt to follow an exploratory approach coherently, we strived to maintain a neutral point of view when asking our informants to remember the BMI process they went through when their startup was in its early stages. In getting the multiple case study off the ground, BMI theory was needed solely to act as a starting point to draw up a sufficiently broad research question, and so initiate the data gathering process (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). The informants were not exposed to any preordained relationships with other theories or approaches, such as LSAs and AD, before or during the interviews.

Case sampling was performed theoretically (Eisenhardt, 1989; Meredith, 1998), and following our interpretive stance, cases were selected according to how heterogeneous they were in terms of two relevant variables that could have had an influence over the BMI process: (i) environmental dynamism - moderate or high; and (ii) the startup's role in terms of being subject to or determining such dynamism. Following this choice, we identified three relevant cases concerning digital mobile platform startups that either operate in a moderately dynamic environment (Case A) or a highly dynamic environment (Case B) to which they are subject, or in a highly dynamic environment determined by the digital startup itself (Case C). The level of environmental dynamism and the digital startups' role within their environment were informed by the analysis of secondary sources, as suggested in Meredith (1998). Despite competing in different industries - namely, home maintenance and repair services for Case A, cashless payments for Case B and accommodation services for Case C - a common factor for all three digital startups was that they operated a multisided platform business connecting different pools of customers (Evans & Schmalensee, 2016; Gawer, 2014) and, having selected similar business approaches, it was easier to carry our comparisons and cross-case analysis.

We opted for a multiple case study since this approach potentially reinforces the process of generalizing results (McGrath, 2010; Meredith, 1998), while enabling a comparative analysis of the findings, because the theoretical sample can possibly include extreme cases, polar types

or niche situations (Meredith, 1998). Despite this, the limited number of digital startups included in the sample allowed us to retain the positive properties of a single case study methodology in terms of acquiring an extensive qualitative description and analysis of BMI in the early stages of the startups' development, together with the needed depth and insight, which is difficult to replicate on a wider sample (Handfield & Melnyk, 1998). For all three cases, our unit of analysis was the early stage BMI process undertaken by each digital startup, with its steps and constituent elements as possible sub-units of analysis.

3.1. Data gathering

In our multiple case study, data were collected through multiple sources of information (Yin, 1984).

Face-to-face, semi-structured interviews were the primary source of information. Because the interviews used in the data collection process were semi-structured, this meant that the interviewers could start from several key issues identified from the research question - and so not risk leaving the interviewer at the interviewee's mercy - while allowing any innovative matter to emerge from the ensuing open discussion (Walsham, 1995; Yin, 1984).

The researchers first crafted and carried out two pilot interviews with two founders of a digital startup not included in the theoretical sample, known to the researchers from being involved in previous studies. The pilot interviews allowed us to confirm that the research questions and related sub-questions were clear to the informants and could lead to insightful discussions - although the pilot informants' feedback did lead to minor changes in the wording of the questions to improve clarity.

Following the pilot interviews, the researchers carried out thirteen semi-structured interviews over three distinct waves with the three digital startups in the theoretical sample.

The six interviews in Case A took place between February and July 2015 with the four founders of the digital startup - the current Chief Executive Officer (CEO), Chief Operations Officer (COO), Chief Digital Officer (CDO) and Chief Financial Officer (CFO) (one interview each) - and its Marketing Vice President (two interviews). The four interviews in Case B took place between April and October 2017 with the three founders - the startup's CEO (two interviews), COO and CFO (one interview each). The three interviews in Case C took place between September and October 2017 with one of the startup's founders - its Chief Marketing Officer (CMO) - one Project Manager and one Product Specialist (one interview each). In Case C, one researcher was a participant observer at two strategic meetings between the CMO and his team, where they spent a total of 130 min covering the BMI process, allowing us to gain further understanding of the process under scrutiny.

The interviews lasted between 70 and 90 min each, with an average of 84 min.

The protocol of the interviews was consistent with the study's research question: the informants were asked to describe and comment on the Business Model Innovation process undertaken in their digital startup during the early stages of its development - where by early stage we mean the period when the startup's business model was undergoing its most significant innovations leading to its first consolidation. In addition, the informants were invited to discuss the key steps in this BMI process, as well as the constituent elements they dealt with and focused on. As a result, the interviews included a first set of questions on the initial working version of their business model in the early stages of its development (with questions like: "What was your value proposition? Who were your initial target customers? How did you organize your digital startup to create and deliver your value proposition to customers? Were you already making a profit (i.e. capturing value)? If yes, how? If not, why not?"). These questions were based on the widely accepted conceptualization of a business model as the process whereby an organization creates, delivers and captures value (Kulins, Leonardy, & Weber, 2016; Saebi, Lien, & Foss, 2017; Teece, 2010; Zott et al.,

2011). Similarly, a second set of questions centred on the startup's current version of their business model, the one that emerged from the innovation process. Then, based on Foss and Saebi's (2018) concepts on BMI, we devised a third set of questions to investigate the business model's innovation steps and its process (including questions such as: "What are the main changes to your digital startup concerning the way you create, deliver and capture value? Why did you make these changes?").

It is worth mentioning that, when tackling complex phenomena in their real-world context, it is very common for both the interviewers and the interviewees to unconsciously miss or neglect some points. To handle these observer biases (Yin, 1984), we included the first and second sets of questions, to obtain a clear picture of the business model before and after the BMI process; these distinct and comparable sets of data on *ex ante* and *ex post* business models helped us to interact with the interviewees further, repeating the questions relating to evident changes in the BM that the interviewee had yet to mention. This combination of the first, second and third sets of questions helped us to avoid missing any information on key BM changes. We concluded with a fourth and final set of questions to ask about the approach that had guided the BMI process in terms of its steps and constituent elements (with questions like: "How did you identify the problem and the need for making changes to your previous BM configuration? How did you reach a solution? How did you know it was the right solution? Did you employ any methodology, model, approach, tool or instrument to support and enable this process? Can you describe the difficulties you had to manage during the process of identifying the problems and finding a solution? How would you define the changes introduced to your innovated business model? Radical or incremental? What would you say were the most critical steps, elements and concepts that best describe this process of Business Model Innovation within your early stage digital startup?"). A detailed list of questions driving the semi-structured interviews is given in Appendix A.

As case studies rely heavily on the correctness of the information provided by the interviewees for their validity and reliability, and these can be enhanced by using multiple sources or "looking at data in multiple ways" (Eisenhardt, 1989; Yin, 2003), several secondary sources of evidence and archival data were also added to supplement the interview data, including business plans (one for each case); strategic reports (one for Case A; two each for Cases B and C); informal e-mails (thirty-four for Case A; twenty-five for Case B; five for Case C); meeting minutes (six pages for Case A; twenty pages for Case B); internet pages (sixteen for Case A; fifteen for Case B; forty-two for Case C); newspaper articles (three for Case A; seven for Case B; twelve for Case C); and whitepapers (two for Case A; one for Case B; three for Case C).

This array of sources led to "data triangulation" essential for qualitative research to be trustworthy and persuasive (Bonoma, 1985; Siggelkow, 2007). In view of the fact that, according to Yin (2013), with respect to "operational procedures for carrying out triangulations […] no benchmarks exist to define when triangulation might be considered 'strong' or 'weak' or 'complete' or 'incomplete'" (p. 324), we followed an iterative process, gathering and considering a first set of secondary sources before conducting the interviews, as well as assembling a second set of secondary sources that were cited or delivered by the informants during or right after the interviews. The data triangulation process considered all the secondary sources (i.e. data from interviews, participants' observations, archival data and external documents) obtained at different steps of the process - see Appendix B.

3.2. Data analysis

The responses from the interviewees were recorded and fully transcribed. If any information was still unclear and/or more data was needed, the informants were later contacted by telephone to ask for clarification.

Then, following the recommendations of Eisenhardt (1989), a within-case data analysis was carried out to generate the necessary insight into the issues under scrutiny; a subsequent cross-case analysis allowed us to make a comparison between the different responses given by the informants from the three different startups.

Concerning the within-case analysis, interview content analysis was performed by borrowing the open coding practice from Grounded Theory methodology (Glaser & Strauss, 1967; Strauss & Corbin, 1998), a method suitable to study complex phenomena through a clearly defined procedure based on coding - i.e. labels, concepts and words used to produce theory from interviews, rather than the mere finding of facts (Glaser & Strauss, 1967). The empirical material was codified through textual analysis, and archived using a software package.

For each of the three cases, we built an inductive coding tree based on both "in vivo" and constructed codes (Glaser & Strauss, 1967), recording the exact wording used by the informants to describe the process being investigated, as well as the constructed wording induced by the researchers. The codes relating to the interviews for each startup were iteratively contrasted and compared in order to group them into sets of first order concepts. These first order concepts were then further grouped around a set of second order themes or categories, allowing us to view the data at a higher level of abstraction (Clark et al., 2010). Eventually, as a third and concluding step, the second order themes were grouped into overarching dimensions that captured the most important steps and constituent elements in a BMI process. Through the inductive coding tree, fine-grained in vivo codes were transformed into aggregated concepts, and the real-world content obtained from the qualitative interviews enabled us to proceed with the abstraction and theory building (Saldaña, 2009).

With reference to cross-case analysis, we looked for similarities and differences between Cases A, B and C with reference to the first order concepts, second order themes and, above all, the overarching dimensions (Yin, 1984). This concluding procedure allowed us to contrast and compare the BMI process steps and constituent elements within the three very different digital startups under investigation, allowing us to make the best use of our multiple case study on Digital Entrepreneurship to "capture the novel findings that may appear in the data" (Eisenhardt, 1989 - p. 541).

To conclude, the case results were reviewed and confirmed by the interviewees, to potentially amend any error or bias and ultimately enhance the correctness of our interpretations.

4. Cases

The multiple case studies relate to three digital startups undergoing early stage Business Model Innovation, heterogeneously positioned in terms of their environmental dynamism - moderate or high - and role in determining such dynamism.

4.1. Case A - moderate environmental dynamism imposed upon the digital startup

Case A refers to a digital startup founded in 2011. The founders recognized the need for a two-sided platform capable of matching the offer (i.e. from SMEs and individual providers) and demand (from private customers) for services and errands such as cleaning, house maintenance and repairs. When private users post a request for a service or errand on Case A's platform, SMEs and individual providers viewing it can send a description of their services and relative quotations to their potential customers, who will then select the service provider who offers the best service description-quotation trade-off, activate the transaction and execute a payment; the startup receives a service fee of between 5% and 7% for each transaction - this is the pay per transaction model.

The digital startup operates in a moderately dynamic environment - that of traditional house maintenance and repairs services and errands -

and, although it innovated its model, it did not dramatically reshape its industry or intensify the industry volatility and turbulence.

In the early stages of its development, the digital startup went through several BMI cycles, which tackled different sides of its business model, with a focus on the mechanisms for capturing value.

4.2. Case B - high environmental dynamism imposed upon the digital startup

Case B refers to a digital startup founded in 2013 that handles electronic payments between individuals and merchants. The platform allows end-users (buyers) to make feeless cashless micropayments, while it charges merchants (sellers) a fixed fee for transactions of more than 10€. When users register on the platform, they are automatically assigned a virtual wallet; users can designate a weekly budget to be paid to the platform, and an algorithm automatically uses SSD (Single Europe Payment Area - SEPA - Direct Debit) to collect this sum from the user's bank account and place it in their virtual wallet. This weekly budget is capped at 200€. At the end of every week, the users' budget is automatically reset by collecting the amount spent or depositing the excess - built up whenever the user receives a peer-to-peer payment from other users. Considering the merchants' side, every night the platform makes an SCT (SEPA Credit Transfer) transaction to move the sums collected during the day directly into the merchants' bank account.

The startup's main strategic goal was to pursue fast growth, enabled by integrating the platform into different channels, thus allowing increased market coverage while facilitating its adoption by both users and merchant - in line with its positioning as a two-sided platform.

The startup illustrated in Case B operates in the "financial technology" (or FinTech) industry, where digital technologies can enable innovation in the standard financial services typically provided by banks and insurance companies. As a result, the financial services industry - with specific reference to e-payments - has been the "land of conquest" for many newcomers having to compete against each other as well as against the incumbent financial services companies (Mills & McCarthy, 2017), thereby increasing market turbulence. The digital startup investigated in Case B operates in a highly dynamic environment (i.e. the e-payments sector), although this dynamism was the outcome of various macro-trends rather than the startup's own strategy and innovation; nevertheless, the startup was interested in innovating its BM with a focus on value delivery mechanisms, in order to adapt to and align itself with this highly dynamic environment.

4.3. Case C - high environmental dynamism determined by the digital startup

Case C relates to a digital startup founded in 2007 that offers an accommodation booking service, whereby people can list, find and book various types of accommodation - e.g. apartments, rooms, villas - around the world through their mobile phones or over the internet. The startup's original aim was to target and enter a niche market by redesigning the whole customer experience, allowing users to reserve accommodation in a few clicks using digital technologies. As a result, the founders created a two-sided platform capable of matching the offer (i.e. house-owners or hosts) and demand (i.e. private individuals or guests) for overnight stays in periods when hotels are potentially expensive or hard to come by because of popular or busy events held in the surrounding areas. Once private individuals have registered on the platform, they can easily find and contact the best house-owners or hosts for their desired overnight stay. Considering the hosts' side, upon registration, house-owners can post a description of their offer and chat with potential guests, giving them more information about their accommodation. When the expectations of both sides of the platform - guest and host - are matched, the payment can be transferred through the platform, with the digital startup in Case C retaining a booking fee - a small percentage from the host and a bigger one from the guest.

While the digital startup initially targeted a specific niche, its innovation proceedings eventually introduced a disruption to the entire accommodation industry. The startup's matching platform largely contributed to the uprise of the informal tourism accommodation market, directly influencing other traditional competing offers from hotels and resorts. By redesigning the entire customer experience, the digital startup helped to create a new standard for customer expectations and satisfaction, affecting other traditional companies operating in the tourism market - e.g. traditional brick-and-mortar travel agencies - which, in turn, found it difficult to adapt and exploit the opportunities deriving from digital technologies (Candela & Figini, 2012; Kracht & Wang, 2010). As a result of the shakeout in the tourism sector induced by this digital startup, several incumbent businesses went bankrupt relatively abruptly, in line with the expected implications of the what is known as "big-bang disruption" (Downes & Nunes, 2013). This disruption came about through the digital startup's BMI, which largely focuses on radically new value creation mechanisms that triggered high environmental dynamism within the whole tourism industry.

5. Results

In line with the methods presented in Section 3, we have described the three inductive coding trees for the digital startups involved in our multiple case study. These representations allowed us to structure within-case results that converge towards the more theoretical overarching dimensions or concepts. Table 1 shows the inductive coding tree for Case A, while the coding trees for Cases B and C are given in Appendix C.

It is worth noting that Table 1 is not meant to be either a causal or a dynamic model in itself, but rather a representation of the core concepts and their relationships.

These inductive coding trees were derived from the interviews' protocol discussed in Section 3.1. More specifically, for Case A, the first order concepts and second order themes that determined the overarching dimensions of value delivery and value capture largely derive from the semi-structured questions belonging to the first three sets of questions - as reported in the Annex, while the content that had been structured during the overarching dimensions of experimenting and testing, operational agility and entrepreneurial and innovative organizational culture mostly come from the fourth set of questions. With reference to Case B and Case C, the content and overarching dimensions relating to value creation, value delivery and value capture came mainly from the first three sets of questions, while most of the content relating to experimenting and testing, operational agility, strategic agility and entrepreneurial and innovative organizational culture was derived from the fourth set of questions on the BMI steps and its constituent elements.

While the interviews' protocol and sequence of questions helped in crafting the study's results and the ensuing discussion, because the interviews were conducted in an open and semi-structured manner, it is not possible make a straightforward connection between every question and each coded concept, theme or dimension, as these results often originated in the combination of multiple answers to different questions.

A cross-case comparison was also performed to complement the within-case analysis and underscore the main similarities and differences between the three cases and search for any patterns followed by the digital startups during their early stage Business Model Innovation process.

In line with Eisenhardt (1989), a cross-case analysis was conducted along two different strategies. First, the digital startups A, B and C were compared to examine the divergence between the two variables used in the theoretical sampling: (i) level of environmental dynamism - moderate to high - and (ii) role of the startup with reference to this dynamism - whether it had been imposed on or determined by the startup. Second, the cases were compared with reference to the first order

concepts, second order themes and, most importantly, overarching dimensions, to identify any possible pattern match or mismatch: this was operationally achieved by merging the coding trees of the three cases.

The cross-case analysis ultimately fed into a unified framework to generate our propositions, and these could be used as a research agenda to investigate the relationships between Business Model Innovation, Lean Startup Approaches and Agile Development in varying combinations of environmental dynamism and the startup's relative role therein.

6. Discussion

The exploratory multiple case study revealed several findings about how digital startups carry out Business Model Innovation in contexts where the levels of environmental dynamism vary as does the role played by the startup in determining this dynamism - or not.

In an attempt to extract a contribution from our exploratory research for both theory and practice, our discussion will first treat each case in isolation, elaborating on each coding tree and the relative within-case findings. Subsequently, the cross-case analysis will provide the basis for a reference framework and set forth a set of propositions and resulting research agenda.

6.1. Discussion of within-case findings

In Case A, the digital startup operates in an industry of moderate dynamism which the startup had no direct part in generating. During the early stages of its development, the startup touched upon all foundational elements of a business model - as revealed by the overarching dimensions of value creation, value delivery and value capture. Value creation consisted mostly of crafting a differentiated offer that satisfied both sides of the platform set up by the startup - a critical task for any multisided platform business (Gawer, 2014) - and value delivery focused on managing multiple delivery channels, with the startup playing an intermediary role between demand and offer, together with setting up the right strategic partnerships. The startup's focal innovation activity concerned its value capture proceedings. Informants frequently redirected the conversation towards their efforts to find the right pricing strategy - e.g. fees for users and merchants, with the option of both sides of the platform paying for the service -, introducing new revenue streams into their revenue models and properly balancing revenue with their cost structure.

Not being forced to compete in a highly volatile environment, the digital startup concentrated its BMI on discovering the most profitable mechanism to capture value. This was confirmed by the CEO: "*Our business idea was clear to us, as was how we were to deliver it. The real questions puzzling us in those first months were: are users or merchants, or users and merchants, willing to pay for it? And how much? On top of that, we were trying to figure out the actual costs to build and maintain our platform*".

This close attention to the operation's economic and financial viability was reflected in the testing dimension: most testing - in terms of hypotheses, minimum viable product and metrics - were meant to validate their assumptions on pricing, fee balancing and customer acquisition costs. All such assumptions were proved or disproved by carefully assessing customer feedback.

The startup's positioning in a moderately dynamic industry, with little ambition to trigger dramatic changes, led to its strong commitment to operational agility, where Business Model Innovation had the function of ensuring constant operational alignment - with the COO having a key role in leading BMI - and managing its existing endowment of resources to meet the challenges and complexity of its internal and external environment. When managing projects, the startup also achieved agility in its operations and tactics by systematically introducing a number of agile and lean methods, like Scrum Sprints, use cases from the Rational Unified Process (RUP) and Feature-Driven Development. As the COO stated, "*being constantly flexible, agile and lean*

Table 1
Case A: inductive coding tree.

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts

Placing a high emphasis on revenues from SMEs and individual providers
    Testing on different pricing strategies
    Introducing a cost-per-lead revenue model
	Revenue streams and pricing strategies	Value capture

Decreasing customer and merchant acquisition cost Balancing CAPEX and OPEX	Cost structure	
Developing both a fixed and a mobile channel	Channels deployment and management	Value delivery
Taking an intermediary role	Intermediation	
Allying with artisans' associations	Partnerships	
Re-segmenting the market Starting with a generalist set of services (home maintenance and repairs) that could lead to expansion into different verticals	Customer segments definition	
Enabling cross and up-selling through positive lock-in and network effects (a)	Customer relationship	
Helping individuals in solving everyday problems Offering differential value to customers with affordable cost	Customer value	Value creation
Maintaining proper balance between different platform sides	Platform's critical mass and balancing the demand-offer	
Performing only those activities requested by customers	Focus on value and waste reduction	
Early pivoting of the business idea to meet customer feedbacks Learning through customer validation	Iteration and pivoting	Experimenting and testing
Setting up a pre-totype for the platform Designing a Minimum Viable Product for the application (MVP)	Formulating hypotheses	
Measuring marketing campaigns performance Calculating acquisition cost of customers	Metrics	
Performing Wizard of Oz testing	Testing	
Looking for constant alignment of operations	Internal consistency	Operational agility

Quickly enhancing existing resources and competencies whenever their value becomes evident
    Quickly divesting from existing resources and competencies that become obsolete
    Managing the existing customer base of users and merchants as a core resource
	Existing resources management	

Nurturing responsiveness to short-term, unexpected changes Managing complex operations	Complexity management	

Applying sprints from Scrum framework to timely and efficiently handle projects
    Practicing lean thinking and lean startup
    Integrating customers in the development process
    Building multiple use cases (RUP)
    Adopting iterative development and frequent, incremental delivery
    Building a feature list driving planning, design and coding, in line with Feature-Driven Development (FDD)
	Adoption of agile and lean methods	

Difficulty in understanding when to halt iterations
    Difficulty in setting an adequate pricing for testing
    Difficulty in evaluating the extent to which the original idea should be pivoted
    Difficulty in prioritizing tests
    Difficulty in containing time and cost of testing
    Complexity in managing customer feedbacks in multiple iterations
	Barriers to testing implementation	

Perceiving and grasping new opportunities in the industry Seeing the future of the market in a different way	Vision	Entrepreneurial and innovative culture
Relying on entrepreneurial team's leadership Making sure founders never lose grip on the startup's development	Founders' leadership and control	
Creating cross-functional teams Fostering team collaboration	Cross-functional teams	
Promoting informal communication	Informal and feedback-driven communication	

when innovating our business model was a top priority for us, and lean and agile tools and methods came in handy". This within-case finding confirms the fact that LSAs and AD methods are often tightly coupled and used jointly within the same organization.

The main barriers to BMI mentioned by the interviewees referred to their tests on pricing and costs, confirming their marked focus on operating well-performing value capture mechanisms.

A strong entrepreneurial and innovative organizational culture ran through the entire BMI process - traditionally a given for startups (Gartner, 1985) - manifesting itself through opportunity-seeking behavior, heavy reliance on the entrepreneurial team's leadership, the creation of cross-functional teams collaborating with one another and informal flows of communication. This clearly emerges from a story told by the co-founder about their regular "Saturday Future" meeting: "*every Saturday, my co-founders and I meet for coffee; we each then spend an hour alone thinking about our future as a company, coming together to share and discuss our ideas about future opportunities and the challenges ahead, as well as how we should grab these opportunities and tackle the challenges in the upcoming week. The whole thing lasts for a couple of hours. You may think that's too long for a coffee* [laughs], *but it's how we keep our eyes and minds open to running our startup better*".

The digital startup illustrated in Case B faced a highly dynamic environment battered by technology innovation; the startup needed to adapt to - and possibly leverage on - this environmental turbulence.

While all the business model's foundational elements were subject to innovation in the early stages of its development, the startup focused mainly on testing and changing its value delivery mechanisms. This included the actions of developing a user-friendly mobile app interface; carving out a position in the crowded competitive payment services arena by targeting micro-payments and transactions; filling a structural hole in the cashless payment value network (Gulati, Nohria, & Zaheer, 2000) by connecting users and merchants directly; and obtaining all the necessary accreditations and official partnerships with formal institutions.

Due to the dynamism of the environment in which the startup operates, it clearly intended to place itself within a network or ecosystem that could enhance its position and advantage, while ensuring its capacity to transfer value to customers, although the industry's "[…] *winds of change blew in our faces all day and all night long, and we had to find some kind of 'safe house' to sit tight in: in financial services, that meant getting as many accreditations as possible and building up strong partnerships*", as the CFO put it.

Consistently with the goal of innovating its value delivery mechanisms, the startup's testing was based on hypothesizing about the industry's future value network structure; evaluating the performance of the different channels; assessing customer feedback relating to the channels' conversion rates; and focusing on local areas to increase density, penetration and network effects.

Although the digital startup did not trigger the market dynamism, this situation called for agility at both operational and strategic levels when proceeding with BMI.

The startup's operational agility relied on several factors. These included exploiting the synergies both within the technology infrastructure and among the salesforce involved in propelling the merchants' adoption of the service; properly orchestrating their existing resources derived from financial technologies; quickly adapting to FinTech trends; and leveraging on a combination of agile and lean approaches. The highest operational barriers to BMI encountered by the startup referred to organizational and compliance issues, in line with its strategic objective to find its place in the marketspace. In parallel, a certain level of strategic agility was needed to deal with this dynamic environment, in terms of reinventing traditional ways of doing things by exploiting digital technologies in an original manner; and setting up an alternative to the traditional banking and payment system, one difficult for competitors to replicate. When it came to strategic agility, the startup worked hard to adjust to emerging trends and evolving

customer needs, consistently with how companies immersed in chaotic environments should act, according to Fartash, Davoudi, and Semnan (2012) and Weber and Tarba (2014). Interestingly, when discussing BMI and the need to be strategically agile, our informants often referred to Lean Startup and Customer Development approaches. As the CEO put it, "*when dealing with changing trends and customer expectations, Lean Startup and Customer Development* (*we actually see them as pretty much overlapping in some of their phases*) *helped us to learn and pivot fast; scale fast if the innovation we wanted to implement was ok; or fail fast if it was a mistake nobody liked or cared for*".

All of these actions were enabled by an organization sporting a clear vision, where the founders had strong control over their strategies and operations, with highly skilled cross-functional teams and a preference for informal communication flowing both top-down and bottom-up. As the COO said, "*it is still relatively easy for me and my co-founders to meet our employees every day, and is a no-brainer if you want to understand what's going on in your organization and want to move forward consistently, despite all the mess we are regularly coming up against*".

In Case C, the digital startup's BMI determined the high dynamism of its environment. In the early stages of its development, the startup's value delivery and capture mechanisms were both subject to innovation. Rather than focusing on a well-performing profit formula or designing suitable ways to transfer value for its matchmaking platform-based services value, the innovation effort targeted value creation. During his interview, the founder reinforced this idea many times: "*At that time, the other members of the team and I knew that there was something wrong with the* [accommodation] *industry, but we had little idea of what to do to make things better for both guests and hosts.* […] *We kept on wondering how to create a different experience.* […] *Our problem was that the hotel market was there: but it was not the market we had in mind… we had to make things different, way different, and we needed to figure out how*".

Introducing actual disruption through BMI requires a great effort to converge on value proposition innovation, and so come up with something both efficient and effective - in line with the big-bang disruption tenets that claim to break the cost-value trade off, by leveraging on inexpensive technologies to drop costs, while recombining them in an original way to increase value (Downes & Nunes, 2013). Therefore, tests were run based on different assumptions about how to generate alternative sources of value for property owners and renters, which departed radically from the current accommodation business status quo.

Operational agility was a constituent element of the startup's BMI process - in the form of efficiently managing the existing pool of resources and a combination of agile and lean methods to run projects in short iterations. This was reinforced by the Product Specialist: "*we used Lean Startup extensively together with several agile methods like Scrum and FDD, because they tell you how not to waste resources; considering that we had so few resources at that time, it made total sense not to waste them…*". The main operational BMI barrier was related to engaging new customers and onboarding them so that they could start their customer journey with a radically new value proposition and experience. However, the core part of the startup's BMI referred to strategic agility, where the startup was concerned with fighting with well-entrenched incumbents in possession of strong resources - e.g. brand, customer base, marketing budget, financial resources, track record. To achieve this, it created an innovative value system based on complex interconnections of assets, know-how and relationships that, in turn, could generate a defensible competitive advantage.

Rather than striving to maintain internal consistency, within its BMI process, the startup created tensions that tended to break the consistency of its business model elements, with its ultimate objective being to trigger industry-wide disruption. The resulting business model was constantly under pressure, "*stressed and stretched*" in the words of the Product Specialist.

This was the toll the startup had to pay for its attempt to induce
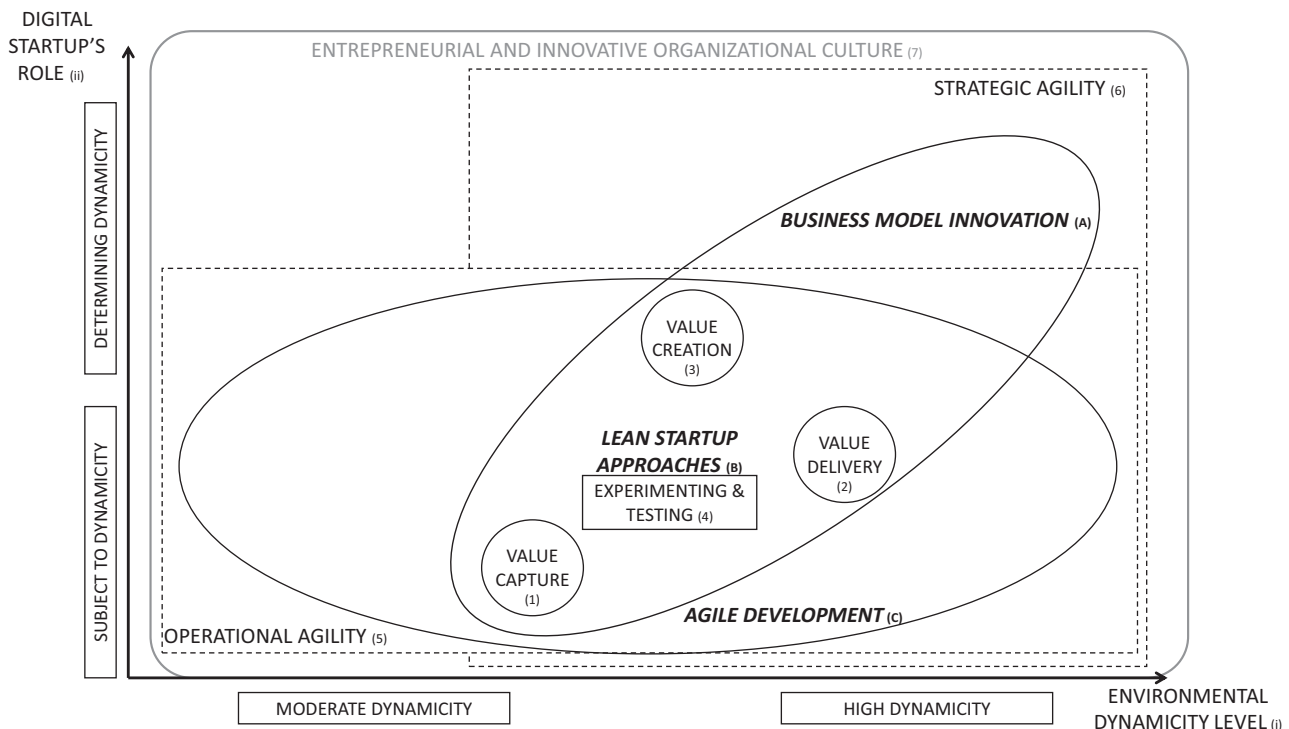
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Fig. 1. A unified framework to connect Business Model Innovation, Lean Startup Approaches and Agile Development in early stage Digital startups.

discontinuous innovation. Again, quoting one of the founders: "*If you plan to radically change a whole market, and you don't really know how, the only things you should do are to keep looking, keep listening, keep learning and be able to disrupt yourself any time you have the chance*". This approach is quite an accurate representation of what Doz and Kosonen (2008, 2010) described as strategic sensitivity, which they defined as the sharpness of perception of, and the intensity of awareness and attention to, strategic developments, which lead to experimenting, distancing an organization from its original business model and reframing it in the light of what is learned through experiments.

This case shares a similar organizational structure and culture favoring entrepreneurial and innovative behavior with the two previous cases and, in addition, it places significant emphasis on the founding members' leadership, foresight and enlightenment, on introducing incentives for risk-taking and assigning a primary role to knowledge generated through customer feedback.

6.2. Discussion of cross-case findings: unified framework and developing a research agenda

Through the cross-case analysis, we were able to obtain an overall view of the findings that had emerged from the exploratory multiple case study.

In the attempt to offer a vivid picture of these multidimensional findings, and so develop both our propositions and research agenda, we built a unified framework to organize the results into the sets of variables, dimensions and domains discussed in this study. First, we considered the two elements used to theoretically sample early stage digital startups and increase the heterogeneity of the cases: (i) moderate or low level of environmental dynamism; and (ii) the startup's role in terms of whether it was subject to or had determined this dynamism. Second, we included the seven overarching dimensions that emerged from the inductive coding trees of the three cases: (1) Value Capture; (2) Value Delivery; (3) Value Creation; (4) Testing; (5) Operational Agility; (6) Strategic Agility; and (7) Entrepreneurial and Innovative Organizational Culture. Third, we introduced three domains involving

concepts, constructs and approaches, linked by the relationship that we wished to explore inductively in this study, namely: (A) Business Model Innovation; (B) Lean Startup Approaches; and (C) Agile Development.

The resulting unified framework is shown in Fig. 1, where all elements listed above are identified by their name and label in brackets.

With regards to the sampling variables in the cases, as suggested by Eisenhardt (1989), we intersected them to design a map where the axes indicate the level of dynamism and digital startup's role; each variable or axis can take two levels - moderate or high, and indicate for each whether the startup is subject to dynamism or determines such dynamism. The resulting space shows where our Cases A, B and C were positioned, allowing for cross-case comparisons. It is useful to note that the intersection of these two variables and their associated levels does not immediately lead to a 2 × 2 matrix, since the thresholds separating the different levels are blurred and, in the real-world, positioning can be to some extent fuzzy - and defining such thresholds lies outside the objectives of this study.

As a second step in building the framework, we charted the seven overarching dimensions which had emerged from the exploratory research on the three cases. All the constituent elements of a business model, i.e. value creation, delivery and capture, were at the core of the early stage BMI process carried out by the startups, as has clearly emerged from our interviews - with specific reference to the first, second and third sets of questions set out in Appendix A. This confirms that, even in the field of digital startups and with reference to the early stages of their development, the business model is ultimately intended to be a value architecture (Foss & Saebi, 2018; Ghezzi et al., 2015; Teece, 2010). Building on this finding, we set forth the following proposition:

Proposition 1. Early stage Business Model Innovation for digital startups revolves around the value architecture elements of value creation, value delivery and value capture.

Although all startups strived to innovate all of their business models' fundamental elements, the relevant insight comes from the different emphases put on the process: Case A - where the startup was subject to

moderate dynamism - focused on value capture, caused by its need to improve its viability in a relatively stable environment that it did not wish to modify in any discontinuous measure; Case B operated under the conditions where the high and uncontrollable environmental volatility forced the startup to embed itself deeply into a network and/or ecosystem of partnerships, while trying to transfer value to its customers; and Case C exemplified a condition where a traditional market is disrupted by the Business Model Innovation introduced by the startup, which had concentrated on finding an original and ground-breaking way of creating customer value. Based on these aspects, we specify Proposition 1 as follows:

Proposition 1(a). The emphasis of the Business Model Innovation process for early stage digital startups varies according to the level of environmental dynamism and the startup's role in being subject to or determining this dynamism. When the degree of dynamism is moderate and imposes itself on the startup, the startup's focus is on value capture; when the degree of dynamism is high and imposes itself on the startup, the focus is on value delivery; when the degree of dynamism is high and the startup has itself determined this condition, the focus is on value creation.

The study also revealed how the BMI of early stage digital startups revolves around the dimension of experimenting and testing - mostly relating to the fourth set of questions listed in Appendix A. All startups relied heavily on formulating hypotheses, setting metrics, iteration and pivoting, involving the overall business model - rather than products and services. This leads to an additional proposition:

Proposition 2. Experimenting and testing the overall business model, rather than products and services, is a core step of Business Model Innovation in early stage digital startups.

Another insightful finding derived from the multiple case study, and one that makes it stand out for its implicit theoretical contribution, is linked to the ensuing emergence of the operational and Strategic Agility dimensions. These dimensions concern the different focus and tensions that digital startups need to orchestrate when the external and internal conditions - i.e. dynamism and the startup's role - changed.

Operational agility mostly referred to implementing agile and lean methods and practices that allow the startups to properly orchestrate their existing pool of resources, adapting them to external complexities; the ultimate goal being to maintain internal consistency. This is aligned with Foss and Saebi's (2018) assertion that BMI should deal with co-ordinating an intricate set of complementarities and synergies between the various resources and activities. The need for operational agility is more evident in Cases A and B, where the startups took a more passive role concerning environmental change, thus showing a rather inward-facing focus.

Strategic Agility is defined as "the ability to continuously adjust and adapt strategic direction in core business, as a function of strategic ambitions and changing circumstances, and create not just new product and services, but also new business models and innovative ways to create value for a company" (Doz & Kosonen, 2008). This notion was set out as being the thoughtful and purposive interplay between three meta-capabilities carried out by top management: (i) strategic sensitivity, that is, the sharpness of perception of, and the intensity of awareness and attention to, strategic developments; (ii) resource fluidity, that is, the internal capability to reconfigure capabilities and redeploy resources rapidly; and (iii) leadership unity, that is, the ability of the top management team to make bold, quick decisions (Doz & Kosonen, 2008, 2010; Vecchiato, 2015; Weber & Tarba, 2014). Startup B and Startup C in particular show significant alignment between the constituent elements of their BMI processes and the way they conceive Strategic Agility: both startups operated in a highly dynamic environment, and used strategic sensitivity, resource fluidity and leadership unity to set up new value systems and business models to navigate through the market.

Case C proved that strategically agile behavior is key to playing an active role in a disruption: the informants underscored how sensing new strategic opportunities, creating new resources and ultimately triggering complexity - rather than simply managing it - were essential in their early stage BMI. Intriguingly, in Case C, BMI largely consisted of constantly creating internal tensions that could break resource stability and business model complementarities, enabling the recombination and renewal of resources; these tensions could then propagate to the external environment and determine the big-bang disruption's singularity (Downes & Nunes, 2013).

Certainly, our research found that operational and Strategic Agility may coexist - as shown in Fig. 1, where the dotted boxes representing these two overarching dimensions overlap to a large extent; however, in the agility continuum, we experience a gradual shift from operational to Strategic Agility as we move towards the top-right corner of our framework, that is, where dynamism and the startup's active role in its determination both increase.

The inclusion of operational and Strategic Agility in our framework allows us to produce the following propositions:

Proposition 3. Business Model Innovation for early stage digital startups entails a combination of operational and Strategic Agility.

Proposition 3(a). The lower the environmental dynamism and the more passive the role of the early stage digital startup having to cope with this dynamism, the greater the emphasis, within the BMI process, on operational agility.

Proposition 3(b). The higher the environmental dynamism and the more active the role of the early stage digital startup having to cope with this dynamism, the greater the emphasis, within the BMI process, on Strategic Agility.

Proposition 3(c). The greater the emphasis placed on operational agility, the more BMI processes in early stage digital startups will focus on managing their existing resource endowment; maintaining their business model's internal consistency and complementarities; and managing complexity.

Proposition 3(d). The greater the emphasis placed on Strategic Agility, the more BMI processes in early stage digital startups will focus on creating and recombining new resources; constantly creating internal tensions that break the business model's internal consistency and complementarities; and triggering complexity.

The cross-case analysis also showed a pattern common to all the startups, in the form of a strong entrepreneurial and innovative organizational culture, supported by clear vision, the founders' driving role, cross-functional and multidimensional teams and informal, and customer feedback-centric information flows. This dimension constitutes a contextual factor that permeates throughout the whole framework. In line with this, we propose the following:

Proposition 4. A strong Entrepreneurial and Innovative organizational culture fosters BMI in early stage digital startups, irrespectively of the level of environmental dynamism and the role played by the startup has when faced with this dynamism.

Beyond the seven overarching dimensions, we enriched the framework by including the three domains whose relationships we were exploring: (A) Business Model Innovation; (B) Lean Startup Approaches; and (C) Agile Development. These domains frequently emerged during our interviews, with specific reference to the question on the methodology, model, approach, tool or instrument used to support and enable the BMI process, as well as that on the primary steps, elements and concepts that best describe BMI (see Appendix A).

BMI, which acts as our driving research question for all our cases, spans across the whole map, although its distinctive features emerge more clearly when the dynamism and the startup's active role both increase (Case C), and we move towards Strategic Agility. Naturally,

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BMI encompasses the dimensions of value creation, delivery and capture - as well as that of testing the business model's constituent elements.

Concerning AD, the interviews and the archival data underscore how the digital startups actually leveraged on Agile Development methods for their daily project management operations. Our informants frequently mentioned a number of terms explicitly - and we collected them as both in vivo and constructed codes -, having drawn them from their adoption of agile methods, such as "sprints" and Scrum (Schwaber & Sutherland, 2011), Feature-Driven Development (Palmer & Felsing, 2001), and Adaptive Software Development (Highsmith, 2000). The adoption of AD is more apparent in Cases A and B, where the startup is only subject to environmental change; moreover, our findings indicate that agile methods still act on the business model's dimensions of value, but chiefly in an operational, incremental and tactical way. Agile Development hence largely falls into the area of operational agility.

To assess the role and positioning of startups in Lean Startup Approaches (LSAs), we took into account the fact that all informants explicitly mentioned that LSAs had been adopted when undertaking BMI proceedings, and that they indicated testing as being an overarching dimension of the BMI process. Since experimenting on the business model is at the heart of Lean Startup Approaches, LSAs are considered to be a method to support entrepreneurs in their BMI endeavors. At the same time, when the informants described how they use agile methods to support their operational testing, they also mentioned lean principles. Within our findings, several touchpoints emerge that connect LSAs and AD: for instance, the concept of MVP (Minimum Viable Products) in LSAs is consistent with the agile principle of minimum upfront planning; similarly, AD and LSAs share the iterative "feedback and change" process, which should involve customers actively in the testing phase.

As a result, our exploration allowed us to infer that BMI, LSAs and AD are indeed related, and LSAs belong to both the BMI and AD fields, thus representing an area where these domains connect and overlap.

We then argue that Lean Startup Approaches stand at the crossroads of Business Model Innovation and Agile Development, and are a form of the agile methods that can be applied to products, services, value propositions *and* whole business models.

The tight connection we found between lean and agile was already pointed at by extant literature: for instance, Smits (2007) argued that the future of agile methods lies in its origins, that is, lean principles; and Serignese (2010) wrote that lean is both the precursor and the future of agile. Our study contributes to extending such connections, by focusing on the LSAs-AD relationship and moving it from the domain of operations to that of strategy, using BMI as a *leit-motif* and common unit of analysis.

In the light of the arguments provided, we advance the following propositions:

Proposition 5. In the context of early stage digital startups, the concepts and constructs used in Lean Startup Approaches stand at the crossroads of Business Model Innovation and Agile Development.

Proposition 5(a). In the context of early stage digital startups, Lean Startup Approaches are a form of Agile Development applied to products, services, value propositions and whole Business Model Innovation.

In addition to the above discussion, we suggest that LSAs also cut across operational and Strategic Agility, providing entrepreneurs with a set of concepts and constructs to orchestrate the tensions between using existing scarce resources to the best advantage and constantly renewing and recombining new and existing resources into other, original ones (Teece, 2007). This consideration is reformulated in the following propositions:

Proposition 6. In the context of early stage digital startups, the concepts and constructs used in Lean Startup Approaches cut across operational and Strategic Agility.

Proposition 6(a). In the context of early stage digital startups, adopting Lean Startup Approaches helps to orchestrate the tensions arising from concurrently managing the startup's existing endowment of resources and recombining them into new and original resources.

To summarize, clarifying the relationship between BMI, LSAs and AD opens up a number of opportunities for cross-fertilization between these fields and the associated concepts and constructs. While having no ambition to be exhaustive, we point to the four directions mentioned in our introduction (Section 1) and literature review (Section 2). First, by linking BMI research to LSAs, this could help to solve the paradigmatic problem that weighs on Business Model Innovation theory (Foss & Saebi, 2018), inviting BMI researchers to accrue cumulative empirics through LSA cases: for instance, the metrics for measuring BMI could mirror the LSA metrics found in the startups' cases. This cross-fertilization could be bidirectional, as the LSAs could explicitly include BMI concepts, such as the notion of complementarity between the business models' different constituent elements - thus encouraging the design of MVPs that could be tested for more hypotheses and BM parameters at the same time. Second, recognizing how BMI and LSAs are related could provide further evidence that the business model concept is shifting to include demand-side value (Massa et al., 2016). This theory is fully aligned and consistent with LSAs, where a value proposition can be designed and innovated on the basis of demand-side elements - e.g. the customer's perception of value. Third, BMI research could look for a strategic application of other agile methods beyond lean, thus extending the range of applications for AD, a point currently under question (Cooper & Sommer, 2016). Fourth, Agile Development could possibly expand and deepen its theoretical foundations by taking elements from the Business Model Innovation and the Strategic Agility streams.

7. Conclusions

This study investigated how digital startups in the early stages of their development engage with Business Model Innovation, in contexts with different levels of environmental dynamism and where the startups take on changing roles, in terms of whether they determine such dynamism or not. More specifically, we designed a multiple case study to explore whether BMI is related with Lean Startup Approaches and Agile Development, and how environmental dynamism and/or the startup's role therein can influence this relationship.

Like all research attempting to frame reality in a model, our study is not free from limitations. These for the most part depend on: the peculiarity of the context under examination - digital startups in the early stages of their development - as well as the small sample size, which could limit the generalization and relevance of our findings; and the observer bias typical of qualitative studies, which could lead to the loss of valuable information and insight and is dependent on several factors - e.g. the informants' poor understanding of the researchers' questions and their inaccurate recollection of events -; and the researchers' inability to properly grasp, interpret and inductively aggregate the information provided by the informants. Concerning the first limitation, we started from the assumption that early digital startups could provide a relatively novel case within a fast-growing empirical field where we could adventure into BMI, LSAs and AD processes and relations. Having said this, future studies should try to replicate our research in different and possibly more mature contexts, with broader theoretical or even statistical samples. With regards to the second limitation, our reliance on a well-established method, which we applied throughout the data collection and analysis steps, has possibly helped to enhance the soundness of our qualitative exploration into how the lean and agile Business Model Innovation unfolds.

Despite its limitations, this study contributes to both theory and practice in multiple ways.

Our work provides value for theory insomuch as it delivers a unified framework that connects BMI, LSAs and AD - as well as their main steps and constituent elements - to operational and Strategic Agility (Doz & Kosonen, 2008, 2010). Adding to the current research stream on how to build Strategic Agility from a resources and capabilities perspective (Battistella, De Toni, De Zan, & Pessot, 2017; Johnston, 2009; Teece, 2007), we argue that the approaches and methods discussed for LSAs and AD may be used to adequately orchestrate and manage the startup's extant resource endowment, or stimulate the creation of new resources by recombining resources differently. Hence, BMI in a Strategic Agility framework can fruitfully draw on Agile Development and Lean Startup Approaches to nurture Doz and Kosonen's (2008) meta-capabilities of strategic sensitivity, resource fluidity and leadership unity.

Through our framework, we claim that Lean Startup Approaches can be perceived as a form of Agile Development operating at the level of strategy and business models. In other words, LSAs are agile methods for Business Model Innovation. We hence explicitly embed the roots and antecedents of the practitioner-oriented LSAs in the Business Model Innovation and Agile Development fields of research. Because theorizing on common practices among practitioners - and LSAs are widely diffused within the digital entrepreneur community - is typically a complex process (Delery & Doty, 1996), discussing the antecedents and identifying the shared themes that connect these practices to other more established research streams - such as BMI, AD and Strategic Agility - is crucial when attempting to construct theoretical foundations (e.g. see Baker, 2007; Damanpour & Aravind, 2012; Lukas, Hult, & Ferrell, 1996; Agarwal & Malhotra, 2005).

This study is a first step towards building theory on LSAs, and opens up a promising research avenue that will call for further academic contribution. In order to pave the way for future studies and foster cumulative theorizing, we also develop a set of propositions that can act as a research agenda, and point towards the opportunity of complementing knowledge in the BMI, LSAs and AD fields.

The resulting value for practice takes the form of identifying the core steps and constituent elements that digital entrepreneurs should consider carefully and deploy in the early stages of their startup's development. Learning how these steps and the elements of value creation, delivery and capture become more or less relevant as the context changes can help entrepreneurs to direct their efforts and allot their traditionally scarce resources effectively. Moreover, by recognizing that they can select from a pool of combinable lean and agile approaches and methods - e.g. MVP and minimal upfront testing; iterative "feedback and change" loops; and Scrum's sprints to restrict the duration of MVP testing by introducing a time box - to support innovation not only to their products, but also to their business model, offers digital entrepreneurs a wider range of operational and strategic options that can be put to use in the practice of both operational and Strategic Agility.

Acknowledgements

Appendix A

Table A.1
List of the questions asked in the interviews.

1st set of questions
Original Business Model Configuration

- What was your value proposition?
- Who were your initial target customers?
- How did you organize your digital startup to create and deliver your value proposition to customers? What were the key operations and processes, your resources and competencies, and were any third parties involved in the value creation and delivery processes?
- Were you already making a profit?
  - If yes, how? What were your revenue model and revenue stream? What operations contributed to the value capturing process most?
  - If not, why not? What monetization issues did your digital startup encounter?
- What was your cost structure?

2nd set of questions
New Business Model Configuration

- What is your (current) value proposition?
- Who are your customers?
- How is your digital startup organized in order to create and deliver your value proposition to your customers? What are the key operations and processes, your resources and competencies, and are any third parties involved in the value creation and delivery processes?
- Are you making a profit?
  - If yes, how? What are your revenue model and revenue stream? What operations are contributing to the value capturing process?
  - If not, why not? What monetization issues is your digital startup encountering?
- What is your cost structure?

3rd set of questions
Key Business Model Changes

- What are the main changes to your digital startup concerning the way you create value? (For instance, have you changed your value proposition, value creating operations, resources and competencies, third party relationships and/or your target customers?). Why did you make these changes?
- What are the main changes to your digital startup concerning the way you deliver value? (For instance, have you changed your distribution channels and/or the way you interact with your customers?). Why did you make these changes?
- What are the main changes to your digital startup concerning the way you capture value? (For instance, have you changed your revenue model and/or cost structure?). Why did you make these changes?

Table A.1 (*continued*)

4th set of questions
Business Model Innovation process (steps and constituent elements)

- How did you identify the problem and the need for making changes to your previous BM configuration? Did you employ any methodology, model, approach, tool or instrument to support and enable this process?
- How did you reach a solution? How did you know it was the right solution? Did you employ any methodology, model, approach, tool or instrument to support and enable this process?
- Can you describe the difficulties you had to manage during the process of identifying the problems and finding a solution?
- How did you make the changes needed to your business model? Did you employ any methodology, model, approach, tool or instrument to support and enable this process?
- Can you describe the difficulties you had to manage during the process of implementing the identified solution?
- How would you define the changes introduced to your innovated business model? Radical or incremental?
- Have these changes made an impact at the strategic or operational level in your digital startup?
- What would you say were the most critical steps, elements and concepts that best describe this process of Business Model Innovation within your early stage digital startup?

Appendix B

Table B.1
Summary of collected data: all sources.

Data type	Quantity
Pilot - semi-structured interviews	2
Semi-structured interviews	13 (6 - Case A; 4 - Case B; 3 - Case C)
Participant observation	2 (Strategic Meetings - Case C)
Archival records	74 (3 - Business Plan; 5 - Strategic Reports; 64 - Informal E-mails; 2 - Meeting Minutes)
External documents and sources	101 (73 - Internet pages; 22 - Newspaper articles; 6 - Whitepapers)

Appendix C

Table C.1
Case B: inductive coding tree.

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Fixing fees for the platform's money side Setting the cashback level associated to each merchant and transaction	Revenue streams and pricing strategies	Value capture
Keeping testing costs low	Cost of testing	
Comparing customer lifetime value (CLV) with customer acquisition cost (CAC) to ensure viability	Profits	
Delivering services through a mobile application	Channel deployment and management	Value delivery
Having a brokering role Being the "middleman" in peer-to-peer transactions	intermediation	

Partnering with banks and financial institutions
    Obtaining SEPA accreditation
    Creating a network of merchants and users
	Partnerships	

Focusing on micro-payments and smaller transactions Targeting cashless transactions	Customer segment definition	
Delivering value through user-friendly interfaces	Customer relationship	

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Table C.1 (*continued*)

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Offering differential value to customers through affordable costs	Customer value	Value creation
Incentivizing platform onboarding through cashback solution for users and easy/inexpensive adoption for merchants	Platform critical mass and balancing the demand-offer	
Focusing on value-added operations for both merchants and end users	Focus on value and waste reduction	
Early pivoting of the business idea to meet customer feedback Learning through customer validation	Iteration and pivoting	Experimenting and testing
Designing a Minimum Viable Product for the application (MVP) Hypothesizing about the future of the payment industry shaped by digitalization	Formulating hypotheses	
Calculating merchant acquisition costs	Metrics	
Running experiments on user and merchant adoption in local settings, to ensure higher penetration rates	Testing	
Exploiting synergies in the technology infrastructure and the salesforce Assessing the interaction and interdependencies between different resources and factors	Internal consistency	Operational agility
Enhancing existing resources and competencies quickly whenever their value becomes evident Divesting existing resources and competencies quickly whenever they become obsolete Leveraging on FinTech trends to carve out an original proposition and offer based on existing technologies	Existing resources management	
Nurturing responsiveness to short-term, unexpected changes Managing complex operations Adjusting to and leveraging on emerging Fintech trends Scanning the environment to include emerging technologies and regulatory trends in the business model	Complexity management	
Applying sprints from Scrum framework to handle projects in a timely and efficient manner Practicing lean thinking and lean startup Integrating customers within the development processes Building multiple use cases (RUP) Adopting iterative development and frequent, incremental delivery	Adoption of agile and lean methods	
Difficulty in finding highly-skilled members for cross-functional teams Difficulty in ensuring compliance with current regulations Difficulty in finding the right partners Difficulty in containing the time and cost of testing Complexity in managing customer feedback in multiple iterations	Organizational and compliance barriers	
Exploring original ways of doing old things by blending legacy assets with new digital technologies	Original resource recombination	Strategic agility
Setting up an alternative to the traditional banking and payment system, one that is difficult to replicate for competitors	Envisaging new strategies and business models	

Table C.1 (*continued*)

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Perceiving and grasping new opportunities in the industry Simplifying the payments industry through digital technologies	Vision	Entrepreneurial and innovative culture
Relying on entrepreneurial team's leadership Making sure founders never lose grip on the startup's development	Founders' leadership and control	
Creating cross-functional teams Fostering team collaboration	Cross-functional teams	
Promoting informal communication Making bottom-up information flows easy	Informal and feedback-driven communication	

Table C.2
Case C: inductive coding tree.

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Balancing the fees between hosts and guests	Revenue streams and pricing strategies	Value capture
Profiting from both sides of the platform	Profits	
Pursuing a multichannel strategy to deliver value propositions	Channel deployment and management	Value delivery
Performing matchmaking between the properties' hosts and guests	Matchmaking	
Carving out a market niche as a foothold in the industry	Customer segment definition	
Engaging guests and hosts by providing an above-expectations customer service	Customer engagement	

Offering outstanding overall service to hosts and guests, both being platform partners
    Creating a unique bundle of physical products - the property - and related services
    Enable an economic model based on asset sharing rather than ownership
	Customer value	Value creation

Creating unique customer experiences Make travellers feel like a local	Experience	
Populating the platform through adequate value-creating decisions targeting both demand and offer Balancing the properties' demand and offer	Platform critical mass and balancing the demand-offer	
Offering high value-adding services to hosts and guests, as parts of the same whole Cutting non-value-adding activities and processes as early as possible	Focus on value and waste reduction	

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Table C.2 (*continued*)

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Early pivoting of the business idea to meet customer feedback Learning through customer validation Developing the application, software and platform in short loops Deliver prototypes in short iterations	Iteration and pivoting	Experimenting and testing
Designing a Minimum Viable Product for the application (MVP) Managing the existing customer base of users and merchants as a core resource Formulating a discontinuous vision for the future of the accommodations industry	Formulating hypotheses	
Evaluating the different channels' performance Assessing customer feedbacks Setting new metrics as market conditions vary	Metrics	
Running tests replicating customer's natural behavior	Testing	
Enhancing existing resources and competencies quickly whenever their value becomes evident Divesting existing resources and competencies quickly when they become obsolete	Existing resources management	Operational agility
Applying sprints from Scrum framework to handle projects in a timely and efficient manner Practicing lean thinking and lean startup Integrating customers in the development process Building multiple use cases (RUP) Developing customers rather than products Adopting iterative development and frequent, incremental delivery Building a feature list to drive planning, design and coding, in line with Feature-Driven Development (FDD)	Adoption of agile and lean methods	
Complexity in managing customer feedback in multiple iterations Difficulty in finding and engaging trial users, evangelists and influencers	Barriers to new customer engagement	
Exploring original ways of doing old things by blending legacy assets with new digital technologies Being open to the possible recombination of resources encountered along the way Fighting the incumbents' strong resource base with new resources Create innovative value systems based on complex interconnections of assets, know-how and relationships that generate defensible competitive advantage	Original resource recombination	Strategic agility
Learning from alternative and complementary industries Sensing new strategic opportunities to reshape the industry and the startup's business model Constantly innovating the strategy as external and internal contexts vary Constantly stressing and stretching the business model to look for innovative opportunities Envisaging new business models based on the original market niche	Envisaging new strategies and business models	
Leveraging on technological trends to create something that the incumbents would not and could not do Creating such significant market disruption that traditional hotels and resorts do not easily understand what is happening and cannot imitate it in the short term Displacing incumbents' leadership through radical value-driven innovation	Triggering complexity	

Table C.2 (*continued*)

1st order concepts	2nd order themes	Aggregate/overarching dimensions and concepts
Perceiving and grasping new opportunities in the industry Formulating a disruptive vision of the accommodation industry's evolution	Vision	Entrepreneurial and innovative culture
Being guided and enlightened by the founders' foresight	Founders' foresight	

Creating self-organized and self-managed teams
  Training people to respond rapidly to frequent changes in the environment
  Incentivizing people to take opportunities and risks
	Entrepreneurial organization	

Promoting informal communication
  Making bottom-up information flow easily
  Prioritizing customer feedback as a form of organizational knowledge to be spread within the startup
	Informal and feedback-driven communication	

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