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BUSINESS MODEL DEVELOPMENT AND MATURITY IN SOFTWARE-BASED STARTUPS: INSIGHTS FROM A CASE STUDY

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ABSTRACT

Nowadays, the success or failure of software-based startups is highly dependent on a good alignment of technology, market needs and business model. In this context, an appropriate business design is extremely important for such (new) companies. Commonly, software-based startups are technology-centred and tend to neglect the importance of the business model. Nevertheless, they need to go beyond the development of innovative and effective products or services and take into account the profitability of the company through a proper business model. Based on an exploratory case study of a Portuguese startup, this paper suggests three different levels of maturity for software startups named here as first phase: (i) first product and rookie mistakes, (ii) second phase: the market-driven approach and (iii) third phase: mass market orientation.

Keywords: Software Startups, Business Design, Business Model , Strategy, Entrepreneurship.

1. INTRODUCTION

Software development processes should meet the needs of all stakeholders (i.e. clients, customers and users) and result in profitable products and

services. For decades, software development has been regarded as developing according to requirements, where quality software has been interpreted from such "engineering perspective". Later, market demand asked for the inclusion of customers' needs in the development of software, aligning both aspects, in order to achieve a proper alignment of customers' needs with the business system (Lee *et al*., 2004). However, that inclusion was not enough. Markets became extremely demanding, dynamic and unpredictable and new products should meet simultaneously criteria of low cost, high quality and reduced time-to-market. Indeed, agile and lean approaches to software development have been used by practitioners. More recently, a new wave is pushing software development to a higher stand of interdependency and alignment with the firm's business model.

For startups, the level of interdependency and alignment between software development and the business model must be very high. Software development, new product and service design and business modelling should be deeply intertwined because the success of software-based startups is highly dependent on the alignment of technology, market needs and business model. However, many startups are mainly focused on developing software solutions and new software-based products and services, without the necessary attention to the alignment of those development efforts with their business model.

In this context, software development should be integrated with business design. Commonly, these startups are technology-centred and neglect the importance of the business model. These companies are very dependent on a new and innovative product and service. Nevertheless, they need to go beyond the development of innovative and effective products or services. Software design should take into account the profitability of the new company, i.e., a proper business model should be established. If a new company fails or tends to be not profitable in its first months or years, it will be pushed to make considerable strategic changes in order to survive.

In general, startups are not profitable and the study of business modelling for startups and the development of frameworks which can support effective business design is relevant from both theoretical and practical perspectives. Generally, startups are young small businesses, highly innovative, technology and knowledge-based. These companies differentiate themselves from the others by having a high growth potential, by being very dynamic and based on innovative products and services,

and often by being supported on disruptive business models. Commonly, they are also associated with universities, research centres, laboratories and programmes of entrepreneurship. In general, startups tend to have a minimum capital, one or two shareholders and offer their products and services to the local market. Therefore, there is a need for more sophisticated and sustainable business models for startups.

Software startups are particularly paradigmatic and important in this context. They offer new solutions, products and services and tend to adopt new and disruptive business models. The software business is a knowledge-intensive industry which offers the most disruptive business models based on new, unique and unanticipated value propositions to clients, customers and users (e.g. facebook, google). This industry offers a countless number of opportunities for entrepreneurship and for the launching of startups.

Indeed, there are different aspects which should be very integrated namely, firm's strategy, business processes and technology. For instance, Chesbrough and Rosenbloom (2002) define business model as a framework that mediates the process of creating value between technology (development) and economic value. According to Casadesus-Masanell and Ricart (2010) a business model is a reflection of the company's strategy. The reward logic behind the business model can be viewed as the result of the link between firm's strategy and its business processes (Osterwalder, 2004). The articulation of all these aspects supports a consistent and sustainable value proposition for the customer and an appropriated structure of revenues and costs (Teece, 2010).

This paper reports on a case study of a Portuguese startup. This company, Group Buddies (GB), is a Portuguese web development startup focused on creating original products for the web and mobile markets but also offers four main services on demand: web development, mobile development, web design, and lean startup consulting. The initial purpose of the company was to design and sell a specific product but they were forced to offer services on demand in order to generate cash-flows to leverage the development of its own products.

A case study approach was followed. Empirical evidence was collected mainly through semi-structured interviews. The results of the case analysis were interpreted in an iterative process and subsequently they were discussed to understand the relevance of integrating strategy,

business model and technical considerations in the case of software-based businesses and startups.

This paper discusses how and why the initial business model has evolved and it analyses the interdependency between software development processes and the business model. A model for the maturity level of software-based startups based on three different stages is suggested.

The paper is structured as follows. Firstly, several interrelated concepts are presented and discussed in the literature review section. Subsequently, the research method and the case study are presented. Finally, the main findings are presented and discussed. The last section presents the main conclusions and highlights opportunities for future research.

2. LITERATURE REVIEW

Business design is putting together strategies, resources and objectives. Business design is about effectiveness (giving a meaning and sustainability to an organization) and efficiency (the best use of the available resources). To do that, business designers must be able to know: (1) who and where are the (best) clients, (2) which products or services and value propositions are or should be offered in the future, (3) how to do it (in a cost-effective manner). Business designing is giving answers to what, who and how characterizes a firm's business process – (Anderson and Markides, 2006).

New business design can be viewed as an integrative and iterative process which represents the new frontier in design thinking beyond new product and service design. Furthermore, the design of new businesses, products or services cannot be independent of the firm's strategy and the alignment with stakeholders' strategies. New business design is inspirational for the organization, business partners, customers and other stakeholders. At this moment, successful firms grow and diversify through proper design and business thinking.

Firstly, for a correct understanding of business design, we should learn from the experience with new product and new service design. Indeed, concerns, experience, knowledge, tools and techniques applied in new product development can be translated to support a more effective and efficient business design. Nevertheless, these concepts are deeply

intertwined. The exercise of designing bundled new products and services is essentially about business designing. New business design represents the new frontier of a deeper integration of product and service design with organizational strategy and technical features. Secondly, the result of a good business design is a proper business model which explains how to establish a relationship among customers, suppliers and other stakeholders (Slaughter *et al*., 2006).

By deconstructing product, service and business design into its main elements and processes, several aspects are highlighted namely business and design thinking and business model (Slaughter *et al*., 2006). Product and service design and the business model are explained in the remaining of this section.

The design of products and services is a process of transformation of a market opportunity into a product or a service as a result of the matching of market needs, technological possibilities and business architecture (Zott, 2010).

New product development processes are related with one or more of the following three aspects: (1) the use of a new or different technology, (2) the design of new market applications, and (3) some kind of innovation in terms of the market (Firth and Narayanan, 1996). New product development can be incremental or radical. A development strategy that pursues a new market with a new product and technology will create a "real new product". In a new product development process, both technological and product capabilities are important.

The development process for a new product can be structured in the following stages: creation, design, construction, preliminary economic analysis, prototyping or testing of concept, pilot run, product mass production, and entry to market. The development process for new products is essentially about information processing through several steps which take into account that customer needs are translated into a product.

Some elements support a new product development strategy. Firstly, there is a concern in terms of meeting the customer's demand better than the competitors. Secondly, it is important to characterize what is the main market for the design of the new product (e.g. the characteristics of the customers, competitors or distribution channels). Thirdly, one needs to define how much resources and particularly research & development

(R&D) efforts (budget in terms of sales) is committed to the process of product development. Fourthly, it is crucial to assess if the technological characteristics of the product are aligned with the company's technical capability.

On the other hand, service design process asks for a correct conceptualization of the service concept. Unlike a product, service components are often not physical entities. They are a combination of processes, people skills, and materials. Nevertheless, service design, as well as product design, is crucial to ensure that the offered service is what the client needs. Service organizations must have a focus on the design and delivery of their service concept.

Similar to the concept of product design, new service design is a process of developing new services through several stages from the idea to the launching of the service. Service design can be defined as documenting the service concept in specifications, drawings, flowcharts, etc.

Product and service design has been evolving and, nowadays, it can be a very complex process supported on advanced tools and approaches (Baker and James, 2005). In general terms, it is viewed as a process related with innovation or R&D, market analysis and manufacturing or engineering (Kohn, 2006). Nevertheless, it should also include a business dimension from a strategic perspective which goes beyond the traditional financial viability analysis.

Furthermore, business design is about business modelling. According to Timmers (1998), a systematic approach to designing business models may be based on value chain analysis. Typically, the five primary elements of the internal value chain are: (1) inbound logistics; (2) operations; (3) outbound logistics; (4) marketing and sales, and (5) customer service.

According to Sorescu *et al*. (2011), a business model is a very specific system of interdependent structures, activities and processes that support the logical of an organization or firm, both to create value for its customers and to appropriate value for itself and for its partners. The articulation of the means by which a firm creates and appropriates value allows a clear delineation of the sources of its competitive advantage, which facilitates the updating and strengthening of the business model. Accordingly, the presence of these interdependencies transform the entire set of structures, activities and processes in an integrated system. In short, the fruitful

interaction of all elements of a business model is crucial to the success of its implementation (Sorescu *et al*., 2011).

Chesbrough (2010) believes that a business model fulfils the following functions: 1) articulates the value proposition; 2) identifies a market segment and specifies the mechanism for income generation; 3) defines the structure of the value chain required for create and distribute what is offered as well as complementary assets; 4) details the income structure through which the firm will be remunerated; 5) estimates the cost structure and profit potential; 6) describes the firm's position within the process of value creation, establishing a connection between suppliers and customers; and 7) formulates a competitive strategy and defines the competitive advantage over the competition.

Morris *et al*. (2005) state that, among others, the design of a business model should take into account the following questions: how (it is done)? and for whom (it is done)? According to Morris *et al*. (2005), the business model aims to satisfy the needs of current and new customers, with products, services or a combination of both, and through different or new forms of promotion, production, distribution or delivery of such products and/or services? All firms in an industry develop their strategies based on their responses to three key questions: 1) Who should be selected as a client? 2) Which products/services and value propositions we offer to the selected clients? 3) How to offer these products/services in a cost-efficient form? (Anderson and Markides, 2006).

3. RESEARCH METHOD

A case study approach was followed in this research project. The results of the case analysis were explored and subsequently they are discussed. The empirical data contributed with valuable insights to understand the process of business design of a software-based startup. The case study method is used to collect data about a contemporary phenomenon. According to (Yin, 2003; Yin, 2003) 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.

Findings from a case study can be used to make contributions to theory. In terms of theoretical contribution, the case study method can be included into the critical realism paradigm being and inductive approach for theory construction. However, a case study is typically used with exploratory purposes. According to Yin (1994), the quality of this research method design depends on its construct validity, internal validity, external validity and reliability. Construct validity is the process of establishing correct operational measures for the concepts being studied. External validity is the process of establishing the domain to which findings can be generalized and conclusions can be transferred. Finally, reliability implies a well-defined set of procedures/protocols, typically a case study protocol is established and a database records all the collected material.

The empirical data was obtained essentially from a series of interviews with the CEO of the company. In this study, we have used semi-structured interviews because they allow one to obtain rich empirical data. Four semi-structured interviews were conducted since July 2013 and January 2014, lasting each one hour on average. An interview is an intentional conversation, usually between two persons, although sometimes it may involve more people in order to obtain additional information and support a better triangulation of the data. In this case, the three initial interviews with the CEO were conducted by one of the authors and the last one was conducted by the two authors. In order to make the interviews more informal, they were not recorded and just hand-notes were taken. The hand-notes were revised several times and permitted to produce a report of several pages of text. Then the empirical data was broken down, examined and categorized. The main findings were several times discussed and reinterpreted. Accordingly, authors analyzed the empirical data combined with the literature.

Group Buddies (henceforth GB) is a web development company from northern Portugal that aims to create innovative products for the web and mobile markets. GB focuses its core business in providing four main services on demand: web development, mobile development, web design, and lean startup consulting.

4. FINDINGS AND DISCUSSION

GB provides a good example of the path taken by software startups, in terms of business model. Like many other companies, GB started with a strong technological base, and very little business orientation. Initially, the concerns are more focused on techniques and on issues that are not later valuated by the market. However, despite the errors and difficulties, typical in startups, GB was able to react very quickly and after the first year of life, the company redefined its approach to the market. During the second year, the business was stabilized and the company defined a strategy for growing and differentiating itself in the market. Currently, GB seeks to differentiate precisely through knowledge obtained with its own mistakes – notably by offering consulting services to startups.

Indeed, GB may constitute a paradigmatic case of the learning process that most of the technological startups go through. GB is also an example of the response that a startup can give to the difficulties faced in the earlier years. At GB, this learning process was very fast. In this case, it is possible to see three steps in this process of growth of the business model in these companies. Furthermore, business design appears to overlap product and service development. Similarly, it shows that in startups, the development of products and services targeted for specific clients can precede an orientation to the market. These two different approaches have different implications and tend to occur at different times.

In the case of startups, business design and product and service development are closely connected and interrelated. The success of these companies depends on the ability to connect these dimensions in space and time. Three different moments can be highlighted in this process namely, (i) first product and rookie mistakes, (ii) second phase: the market-driven approach, and (iii) third phase: mass market orientation.

4.1. First Product and Rookie Mistakes

The first GB product was “Handy Ant”. Although initially this business idea had some acceptance and quickly attracted close to 20 customers. Similarly, it was also quickly found that this product wasn’t solving a real need of the customers. After a year of its launch, the product was discontinued. In the initial phase of the company, its main focus was in product engineering and not the business of the

product. This was a rookie mistake: developing a product without any connection to the market to which it was directed.

A bad first product, without market or inadequately designed from the market perspective, produces a bias in the business model that can compromise the future of the company if it does not quickly change its strategy. There are upfront costs that may not be recovered and business partners that may not continue to the end of the first year of life of the project. In startups, the nature of the first product strongly affects the business model that the company puts into practice.

According to the GB CEO, in the beginning it is not clear that it is necessary to know much about the market and about the business for which the product succeed.

"The first thing is to know if there is a problem! Often there is not a [real] problem [that precedes product development] ... after one proves the existence of the opportunity or of the problem, we should to know the market […] and only then… think about the solution!" (CEO)

GB launched a challenge for product development to students and researchers at the university. It was observed that the teams made the so-called rookie mistakes, due to a focus on the technology (rather than on the market). Some ideas raised up but none of them was translated into a product or a service. The first contact with the market and a successful penetration strategy are fundamental.

"Before the first million… you need to know how to get your first one hundred dollars." (CEO)

4.2. Second Phase: A Market-Driven Approach

Quickly, GB had to abandon the first product and decided to redefine its strategy and its business model. With the departure of two shareholders, the company chose to provide services in order to generate cash flow to finance the investment in its own products.

"For a startup, the permanent and biggest challenge is surviving. GB is not different. Growing with a sustainable basis is our biggest challenge […] the provision of services has helped a lot." (CEO)

This second phase is the pragmatic one, in which the company intends to stabilize its business processes and ensure that revenues cover the costs (to reach the break-even point). At the end of this phase, the company seeks to generate surpluses to finance investment that allows it to jump to the next phase. Generally, the second phase takes longer than the first one. During the second or the third year of existence, the company stabilizes in financial terms – either through the initial product if it is commercially successful, or through other sources of revenue, or even through the provision of services.

During this second phase, the company seeks to follow more closely the market. This approach becomes more feasible because the company already has refocused the business, has chosen markets, customers and business partners, and stabilized its internal processes. This is a market-driven phase. There are many startups that are not able to overtake this second phase. At this stage, it is essential to interact with the stakeholders.

GB has recognized the importance of linking the development of products and services with its business design, which began to incorporate this analysis into their development process. Nowadays, GB does not have a process for product development, but rather a process where the development of products is synchronized with the business design.

"Every time we start a project, first we analyze the problem we're solving and try to find the customers and somehow we try to validate if the problem actually exists. Subsequently, we try to find a minimum solution to the problem we're solving. We implement this minimum solution, also called the minimum viable product, and we iterate the development, based in constant feedback from our early adopters." (CEO)

4.3. Third Phase: Mass Market Orientation

This third stage comes when the company is able to acquire the necessary stability of the business and is capable to generate enough cash flows for the development of its own products. This phase means that it is the company that offers solutions that the market or customers need or which they will pay for.

For a startup, this is very demanding, but at the same time more promising. During this phase, the startup aims at developing mass-market products, which require different approaches as the ones used in the previous phases. In fact, the development of the two GB products mentioned earlier, "Cohive" and "inSpace Jobs", was carried on with a different methodology.

"Before we begin any development effort, there was an analysis of the market, there was a turning of the idea and only later a prototype was built." (CEO)

Initially, the "Cohive" product was developed to manage co-work areas, with the main focus on the interaction amongst the coworkers who were in space to work. However, after a couple of interviews it was concluded that it wouldn't be that what the customers were willing to pay for. They wanted something different, something to help them in the daily management of the space, but above all to help them attract more customers and thereby increase their revenues. They were looking for a software product to manage potential customers. This example highlights the need to follow exploratory approaches with a strong focus on customer needs and customer validation.

The market study is essentially a study of the user or the consumer. For a startup, the size of the market and macroeconomic aspects are not critical. A startup needs to evaluate the acceptance of the product by the end user or consumer; if it is accepted, the startup will invest in the development of the product. One expects that near the end of the development and before the product is released, the startup will analyze in detail the market, in order to define penetration strategies, distribution channels, segmentation and pricing policies. For the development, these aspects are not crucial. Instead, the development team must hear the voice of the customer.

During this third step, GB introduced some modifications in the coordination and management of its projects, but also in the development component. Agile software methods were adopted, specially some of the practices advocated by Extreme Programming

that allow one to construct products that can easily be changed according to the new requirements elicited from sources like the market and potential customers.

4.4. Lessons Learned

With the analysis of this case study, some aspects can be highlighted and some lessons can be learned. These lessons are the following.

Firstly, a startup should always start its activities based on the market. Software startups tend to focus on the technological/ engineering issues, but this is always not enough. This is a common mistake, since software startups are usually managed by software engineers, which initially have low sensibility for market needs.

Secondly, a startup should build products that are useful and valuable respectively for users and clients. A common mistake is to develop products that were not previously and properly validated by the market. This means that the startup needs to be very active in contacting and collaborating with potential clients and users, in order to develop products that satisfy their needs and solve their problems.

Thirdly, as it was highlighted by GB's CEO: "companies exist to make money". Product and services are sustainable if they are profitable. Profitability is a function of the characteristics of the product in terms of price, quality and functionality, but also of the revenues model and these should be consistent with the firm's business model. Software-based startups can pursuit different business models and several revenues streams are available but they must be designed in accordance with the firm's characteristics and stakeholders' strategies.

Fourthly, no product sells without a good marketing strategy, since it is very rare that clients find by chance a product. This implies finding the correct channels to promote the product and reach the market and its players. Developing a software product is difficult, but selling it is much harder. In this context, startups need to invest in networking and marketing and have collaborators with such

skills.

Fifthly, software development cannot be supported only be technicians. In fact, successful software products must incorporate business knowledge and, in general, such knowledge is not possessed by software engineers. Therefore, the inclusion in the development process of business experts and specialists that have knowledge in the application domain is crucial for the correct development of the product.

Finally, all these aspects should be combined and be considered in the business design process of a startup. Such business design is crucial for the success of the company and it must connect technology, market needs and the firm's business model. It can be an ongoing process because time-to-market pressures push companies to go to the market as soon as possible. But, a poor business design means that the initial business model is not appropriate, and that more business design is required. In this case, the company probably faces less revenues, losses, difficulties and challenges which could be avoided or, at least, mitigated if a better business design is made. Software development is any longer just a technical process. Software development should take into account stakeholders needs and strategies. Externally, software development must be aware of market needs. Internally it must be aligned with the firm's business model.

5. CONCLUSIONS

Startups are not smaller versions of larger companies. The existing processes that provide good results in larger companies may not be directly applicable in startups. For example, startups spend most of their time searching to validate requirements and market needs. Among the different software development activities and tasks, requirements engineering, and in particular requirements prioritization, has an increasing importance and impact while developing a software product (Sawyer, 2000). Thus, in startups, development approaches should be conducted in a value-aware setting, so that all requirements can be

differentiated according to a business perspective. In the last years, with the arising of customer development and lean startup, we noticed an increasing collaboration from the idea phase into a complete product between business and development. This approach intends to bring a more flexible process into the business side of startups. That has definitely improved the odds of success for new startup products. With the lean startup cycle (Build - Measure - Learn), startups try to find their way to success with a more solid approach, based on data, instead of guessing shots.

Although the technical expertise of a company is important, in many cases the success of a new software product-service depends greatly on the business strategy behind it. This implies that a strong link must be established between the strategy of the software development company and the product development. In particular, the company responsible for the development of a new software product must be able to link business management and software development (Rautiainen, 2003).

Nowadays, a deeper alignment between software development and business design is needed. Startups are typically not profitable during the first years and a proper business design may play here a very important role. In this paper, we propose a three-stage model for the level of maturity in a software-based startup namely, (i) first product and rookie mistakes, (ii) second phase: the market-driven approach, and (iii) third phase: mass market orientation.

Firms which stay at stage 1 persisting in rookie mistakes are condemned to failure. They need to jump as soon as possible to stages 2 or 3. Simultaneously, during the first years, a startup is designing products and services (on demand or their own) , but simultaneously they are consolidating the firm's business model. The success and failure of a startup depends equally from the quality of its product and service design (considering technical, market and economic aspects) and from the business design and business strategy. In these stages, firms can pursuit different approaches namely, market-driven and mass market.

Theoretical and managerial implications can be addressed. For practitioners, the development of methodologies, techniques and tools that turn companies more sustainable are crucial in such very dynamic

and competitive world. Academics should contribute with the study of this phenomenon. Namely, the different approaches to the market, the proposed levels of maturity and different and alternative business models for software-based startups ask for additional research which can test, validate and extend the findings and results presented in this paper.

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