

Development of Market-Driven Business Models in the IT Industry. How Firms Experiment with Their Business Models?

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Abstract

Purpose: The purpose of this research is to explore the role of market in the development of young entrepreneurial startups business models and their subsequent experimentation with business models. We focus on the demand-side to analyze how the market and (potential) customers can influence decisions to develop or innovate a firm's business model.

Design: Data were gathered from firms through interviews with open-ended questions about the evolution of their business model over time. Data were analyzed by using grounded-theory method.

Findings: Two themes emerged, one regarding engaging with the market and another concerning experimentation with business models and changes made after reviewing the situation on the market (firm's responsiveness). Taken together, firm responsiveness and market engagement were used to establish four categories of firm types: passive, active, unfocused, and focused firms. We observe that experimenting with business models is high initially and diminishes over time.

Practical Implications: Changing the business model is essential for success and survival. Firms will be able to take advantage of new opportunities and expand their products and services. Other firms may pivot into different market spaces than originally intended but by doing so rapidly decrease the time to market.

Originality / Value: Our research fills a gap in the literature by exploring the role of market in the development of young entrepreneurial IT startups' business models over time. We propose a framework allowing an analysis of business model innovation in different stages of firm's development.

Keywords: Business Model Innovation, Market Engagement, Startups

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Introduction

New firms often enough collide their ideal products or services with reality, i.e. the market. The acceptance of new products and needs of customers might differ from what firms first have imagined. Commercializing an idea in a situation where there is no need for firm's value proposition is costly thus to avoid a failure new firms develop their strategies and business models incrementally in a discovery driven (McGrath, 2010) or lean startup method (Ries, 2011) rather than in a planned, deliberate manner. The former assumes iteration of business models after testing different business propositions with the market.

Whereas the idea of involving consumers in the creation of value is not new and traces back to the concept of lead users by von Hippel (1986), little research has been found on engaging customers in the development of strategies or business models. Yet firms more and more use "crowdsourcing", i.e. a network of people (Howe, 2006) or customer participation (Vargo and Lusch, 2008; Hoyer, Chandy, Dorotic, Krafft, Singh, 2010; Verhees and Meulenbergh, 2004) to develop innovative business models. Take Threadless as an example of a firm who generated a platform for the user community to create products: artistic T-shirts (or canvases). Cisco went even further and incorporated customers into their organization by outsourcing help desk to them. Platforms are also interesting examples of making consumers part of the firm's business model (e.g. AppStore).

In a recent article, Priem, Butler and Li (2013) observe that the strategic management literature does not sufficiently focus on the consumer-driven business models emphasizing value for customers. Since the 1990's the pendulum in strategy research has been swinging very much towards the Resource Based View (RBV) and internal organization of the firm (Hoskisson, Hitt and Yiu, 1999) focusing more on value capture than on creating value for customers (Priem, et al. 2013). The business model literature that sees customers only as addressees of products and services, therefore, does not keep up with the demand of firms to integrate customers in the development of business models. In this paper we aim to fill this gap by exploring the role of market (especially customers) in the development of young entrepreneurial IT startups' business models

and experimentation with business models. We focus on the demand-side to analyze how the market and (potential) customers can influence decisions to develop or change a firm's business model. We systematically analyze the elements of business models of these firms, i.e. value proposition, value architecture, value network, and value finances as defined by Al-Debei and Avison (2010). Interviews with 9 entrepreneurs allowed us to identify two themes characterizing firm's behavior: market engagement and firm responsiveness. These two themes give a basis for a taxonomy of the behavior of firms in developing business models over various stages of development. We observe that experimenting with business models is high initially and diminishes over time.

This research is part of a larger project that aims at explaining to what extent business model change and market engagement affect the success of a company. The paper reports on an exploratory study that identifies dimensions of market-driven business model development and proposes a framework of business model development over different business development stages.

We firstly discuss previous studies and literature on business model innovation and market engagement our study builds on. Then we outline the method of data collection and analysis applied in the study. The methodology chapter is followed by the results of interviews and our analysis that of the firm's behavior over different stages of development. We conclude the paper with a discussion on our results and their relation to the existing literature. We also provide argument why and how this study is relevant for both practitioners and theory.

Theoretical background

To achieve sustainable value creation, firms must adapt their business models to cope with changes in the competitive environment or else they risk failing in the market (Doz and Kosonen, 2010; Achtenhagen, Melin, and Naldi, 2013). According to many authors, a business model is not static but a dynamic concept requiring shaping, adapting and renewing a firm's business model on a regular basis (e.g. Osterwalder and Pigneur, 2009; Chesbrough, 2010; Teece, 2010). Such a dynamic

approach to business models means reconfiguring the business model elements in a new way and allowing interaction between resources, competencies, organization, and value proposition of the firm to capture value from a technological innovation (Chesbrough, 2010; Demil and Lecocq, 2010). Firm's orientation towards experimenting and exploiting new business opportunities is one of the critical capabilities that lead to business model changes (Achtenhagen et al., 2013). A study of Lehoux et al. (2014) shows that technology startups usually start with a vague value proposition and business model evolving over time validated by stakeholders such as e.g. investors.

A firm that continues exploiting the established business model and is afraid of experimenting, might miss the potential value of an innovated business model (Chesbrough, 2010). Barriers to business model innovation (or adaptation) can be overcome by effectuation and experimentation (Chesbrough, 2010) that triggers business activity through the generation of new data from interactions with potential customers or through real-world experiments with new products (Saravathy, 2008). Such effectuation processes are similar to discovery-driven planning (McGrath, 2010), which enables companies to evaluate key assumptions that have been made in a business model by further experimentation and adapting the initial business model (Chesbrough, 2010). This process is driven by updated information concerning the economic viability of previous assumptions made in constructing the current business model (McGrath, 2010). Other work concerning "lean startup" methods stresses testing business-hypotheses, product iteration and validated learning as the means to shorten the product development cycle and reduce market risks before moving into the next stages of business development (Ries, 2011). A core conclusion of these perspectives is that firms need to find a way to replace the old, reliable business model with a new one in order to be profitable in a turbulent market by experimenting and learning from their environment. They do it in different stages: initial business model design and testing, business model development, scaling up the refined business model and sustaining growth through organizational learning as showed by Sosna, Trevinjo-Rodrigues, and Velamuri (2010). Innovating on a business model is a (dynamic) capability of a company to react to market changes (Sosna, et al, 2010).

To observe the dynamics of business models we observe four primary dimensions or components of a business model: value proposition (description of product/service and market segment), value architecture (organizational and technological infrastructure of an organization), value network (inter-firm relationships of an organization and its position in the value chain), and value finance (costs and revenue models) recognized by Al-Debei and Avison (2010) as the most occurring in the business model literature. Business model innovation (or adaptation) can thus result from reinventing the established (of an existing firm or established in industry) value proposition, existing customer base, deconstructing traditional value networks or the firm's role in the existing value chain (Magretta, 2002; Govindarajan and Gupta, 2001).

Most of the definitions of the concept of business model view customers as an audience for the firm's value proposition and not as a valuable "actor" to be involved in the process of helping firms define their product offering, revenue model, value network or value architecture (e.g., Osterwalder, 2004; Al-Debei and Avison, 2010). To the best of our knowledge, only the study of Plé, Lecocq and Angot (2010) integrates customers into the business model concept. Their Customer Integrated Business Model (CIBM) incorporates customers as resources of the firm that affects its organization and value proposition. The emergent approach to developing a business model suggests that a business model should be evaluated against its current ecosystem of suppliers, competitors and customers and against how the ecosystem may evolve (Tece, 2010; Lehoux et al., 2014). Thomke and von Hippel (2002) recommend integrating users into the new product development process, while Pynnonen, Hallikas, and Ritala (2012) go even further and propose customer-driven business model innovation that involves testing business hypotheses in customer research and then implementing them into the business model.

Market engagement

To explore how startups engage the market in developing their business models in more details, we rely on the concepts of market orientation and customer involvement. We use the term "market engagement" to capture the activities related to both the market and customers. In this way we integrate two sepa-

rate literature streams to capture an inclusive view on how firms engage the market and use customer and competitor information in developing their business model. Market orientation is a firm's ability to understand and make use of the knowledge it holds about its customers, competitors and markets (Hakala, 2010). Market orientated firms analyze and react to changes in the behavior of both customers and competitors in the market (Hakala, 2010). Down the road, knowledge about the market is turned into actions and exploiting new market opportunities (Hakala, 2010; Narver and Slater, 1990).

Two approaches to studying market orientation have dominated the literature to date. One approach splits market orientation into three different elements: customer orientation, competitor orientation and inter-functional coordination (Narver and Slater, 1990). The second approach considers market orientation as intelligence generation, intelligence dissemination and responsiveness (Jaworski and Kohli, 1993). The most notable difference between these two approaches toward market orientation is that Jaworski and Kohli (1993) include firm responsiveness in the market orientation construct. In contrast to later work (Narver, Slater, MacLachlan, 2004), responsiveness does not distinguish between expressed or latent customer needs. Responsiveness is concerned with taking action and reacting to market intelligence by selecting target markets, offering new products to customers or changing the way firms produce or distribute their products (Jaworski and Kohli, 1990). Homburg et al. (2007) have studied the mechanisms that drive the responsiveness of customer oriented and competitor oriented firms. These researchers measure firm responsiveness as the speed of reaction to customer or competitor information. The impact of firm responsiveness on the business model remains an underexplored area in the business model literature.

The notion of customer involvement is mainly concerned with information exchange between customers and firms during various stages of new product development (NPD) stages in order to achieve a more favorable cost vs. time development curve and to reduce risks inherent with the innovation process (Lundkvist and Yakhlef, 2004). Customer involvement includes customer co-creation (Von Hippel and Katz, 2002,

Von Hippel, 2005; Hoyer et al., 2010; O'Hern and Rindfleisch, 2009) and customer participation (Vargo and Lusch, 2008). Von Hippel (2005) stresses the importance of information asymmetry in the NPD process. Ideally, customers have the most accurate information about their needs, whereas manufacturers potentially have the most accurate knowledge of how to satisfy those needs. Thomke and Von Hippel (2002) argue that a firm can reduce this information asymmetry by engaging customers more proactively in the NPD process. Innovation by customers occurs mostly through the efforts of lead users (Oliveira and Von Hippel, 2011). Lead users are characterized as being ahead of the rest of the market with regard to the product domain and related problems that customers encounter (Oliveira and Von Hippel, 2011). Lead users are particularly important for high-tech firms that are operating in highly dynamic and complex environments (Von Hippel, 1986). Other research confirms the importance of customer involvement in the NPD process and its value as an important way to reduce time and expense (e.g., Hoyer et al., 2010), and maps the most appropriate types of input as a function of NPD stage (e.g., Kaulio, 1998). O'Hern and Rindfleisch (2009) proposed a typology of customer contributions that identifies four types of NPD contributions: collaborating, tinkering, submitting and co-designing. Collaborating is defined as a process in which customers have the power collectively to develop the core components of a product. Tinkering is a process in which customers make small modifications to a commercially available product. Submitting means the direct communication of new product ideas between the customer and the firm. Finally, co-designing is a process in which a small group of customers provides a firm with new product designs (O'Hern and Rindfleisch, 2009).

Thus, these two literature streams agree on the importance of customer involvement and firm's responsiveness on the other hand in the new product development. However, research on market orientation and customer involvement in changing business models is limited. In this paper we implement the ideas of engaging customers and responding to market knowledge to look into the insights of business model dynamics in various phases of business development. Using this emphasis, we hope to provide a framework for understanding activities that are necessary for successfully

managing business model change over time.

Data collection and analysis

Data for this study were collected at six relatively young high-tech software startups and three established software SMEs. The IT industry was chosen because of the relative flexibility in adjusting software products to the needs of the customers and because IT companies are examples of value co-creation companies (the AGILE concept of working). These particular companies

were selected based on the diversity of their products as well as the level of innovativeness of the ideas or already existing products. The companies in the sample serve different market segments. As shown in Table 1, the products and served markets ranged from professional soccer teams to procurement organizations, facility management software for hotels, customer intelligence for retailers, location-based advertising for retailers, hiking and cycling software, indoor navigation for hospitals and office buildings and driver intelligence systems for taxi drivers. Although all of the

Name/ Status	FTE	Company profile
Marker startup	2	Marker is a firm that specializes in detecting and locating smartphones. Marker's technology enables to detect the presence and/or localization of smartphones with superior accuracy. /B2C
River Startup	2	River puts taxi drivers in the right place at the right time. River helps to locate passengers, improve occupancy and increase fare revenue of professional drivers. /B2C
Sporter Startup	3	Sporter converges scientific models to intuitive tools in sports. Their first product is the WSSA-model which helps scouts with the selection of new players. /B2B
Cooler startup	30	Cooler allows users to replace the old concept of collecting physical coupons with a mobile application so you can collect and redeem the coupons that you have nearby specific locations of businesses. /B2B
ITech Established	10	ITech provides its customers with motion tracking and vibration monitoring tools. /B2B
Motile Startup	3	Motile provides hotels with standard software-as-a service facility management apps to increase their quality of service and revenue. /B2B
Alife Established	8	Alife has developed an application that provides routes for hiking and cycling enthusiasts. /B2C
E-Proc Established	11	E-Proc specializes in developing and selling e-procurement software to a broad range of actors in the value chain. /B2B
Smarts Startup	7	Smarts dynamic and personal way finding within buildings and surrounding environments. /B2B

Table 1: Company profiles

companies studied are SMEs, they ranged in size from 2 to 30 FTEs. (Nb. The names of the companies have been replaced by fictitious names in order to provide anonymity to respondents.)

Most of the companies were past research and development and market introduction phases. Some had already started scaling up their business model, whereas others had recently introduced their product on the market. One startup was still in the prototyping phase. This feature of the dataset is particularly valuable for analyzing business model dynamics in different business model development phases.

Data were gathered through interviews with key members of the firms and from secondary sources (e.g., company websites, archival records, etc.). Respondents were either CEOs or business development managers. Information obtained from company websites and news articles was used to tailor interview questions appropriately for each firm. Nine in-depth interviews were conducted, with duration of at least an hour. Respondents were asked a series of open-ended questions and appropriate probes about the evolution of their business model over time and what factors played an important role in this process.

The interview guide used in this research consisted of four sections: The interview began with grand-tour questions and discussion about how the product and target market of the company had evolved over time. This was followed by questions and discussion that focused on the firm's openness to business model experimentation. The third section was dedicated to exploring how the firm engaged the market in developing its business model. The final part of the interview involved discussion of the firm's openness to scaling up the business and the future vision of respondents.

The interview data were analyzed by employing the coding techniques and grounded-theory method proposed by Strauss et al. (1998). This process started with open coding which led to the initial identification of concepts, properties and dimensions. Underdeveloped codes that could not be found in most cases were then eliminated in order to focus on the prominent codes that would allow for better comparison of cases. Axial coding was used to relate categories to their subcategories and to gain additional insight in how

properties and dimensions of the concepts are linked to each other. We coded the interview data to capture what the companies in the sample did to gather information from the market and the extent they changed their business models in relation to feedback from the market.

Results

As we focused on market engagement we specifically looked at how the companies we interviewed created their ideas for businesses, how they gathered information in the process of developing their businesses, how they dealt with the feedback they got from the market, and how they changed during the business development process in various stages of development. Two major themes emerged from the analysis, one regarding engaging with the market (market engagement) and another one concerning experimentation with business models and changes made after reviewing the situation on the market (firm's responsiveness).

Market engagement

When talking about the beginnings of their companies and product development, respondents told us how they tested their ideas with customers or potential customers. Some of those companies did desk research on the competitive situation on the market and industry. Sometimes they performed formal market research. As an example, one of the CEOs mentioned,

"What I needed to learn was mostly how to quantify a market size (...) and find out whether my assumptions were correct to validate what I had in mind. Partly that's desk checking or searching. Just using research data about the size of the market." (River)

Other data shows that some companies monitor technology and their competition.

"Delivering standardized and end-to-end solutions is an ongoing trend in the ICT industry. Firms don't want a lot of hassle in their own ICT infrastructure". In addition, another manager mentioned, "We are also moving from saying we will install a server to saying we will provide a server in the cloud. Service in the cloud is 'in' right now". (E-Proc)

"We keep track of them (competitors: expl. authors) as much as we can at the international level. We use the Internet and visit fairs." (Marker)

"It was researching the market purely, I would say. Being a quite technology driven software engineer, I know exactly what is possible to build with the technology that surrounds us. For me it's more a learning journey of defining a product or problem the market has, understand the market and understand the size of that market and what they need to solve their problem." (River)

If the firms talked to customers or potential customers, they would do it in an informal way not necessarily with a large and formal research such as focus groups or conjoint analysis. They engaged in conversations with customers. Some companies were approached by people who had heard about their products. These interactions with the customer were similar to what Sarasvathy (2008) suggests.

"We actually got a request for our firm a couple of times to build a hotel management application. We've talked about different features for the app with parties that were interested". (Motile)

"But then somebody from hospitals came to us and asked us for our product when we were not ready to sell yet." (Smarts)

Some companies are being more proactive and engage in product pilot programs. They engaged their customers in the development of a prototype. This is consistent with the expectations of Oliveira and Von Hippel (2011).

"Our app is in a pilot phase at the moment. We are looking to validate that and our targets for user engagement to be able to scale it further. We should have testimonial information from our pilot customers". (River)

This quote already indicates that the company intends to grow and the growth is very much dependent on the success of the product testing.

The results show different levels of engagement with the market that could be seen as two extremes of a continuum. One end of the continuum indicates low

level of engagement with the market seen in engaging in desk research. The other end: high market engagement, involves conversation with customers and formal product testing.

Firm responsiveness

The companies also told us about how they changed their businesses over time. From this the theme of firm's responsiveness emerged. This theme indicates how the companies reacted to the voice of the consumer. Since we used the elements of a business model proposed by Al-Debei and Avison (2010), we paid special attention when the respondents mentioned their products and/or customers (value proposition), revenue models (value finance), way they organize the company (value architecture), and their relationships with partners (value network).

Some of the companies changed or adjusted their products or shifted to other markets. We list a few examples of firms' reactions. They will be discussed in more detail later in the paper. Here is an example of a change of the market:

"I wouldn't say that the market size really informed or led to decisions of the functionality that we had. It certainly was developed hand in hand with the target market that we wanted to go on and pursue. When we looked initially at more ride sharing type of product, I was looking at some of the user numbers that existing services had, I was looking at the competitors around us. I wouldn't say it was a market size analysis at such, but at that point we moved away initially from ride sharing, because that was quite a crowded space and it had been tried a number of times before. I felt even though we had potentially a strong technical innovation to bring to the market, it was still a very crowded space." (River)

Another example indicates a change in their initial idea for a value proposition and indicated that:

"We decided to continue with our first idea. However, people in the football world our second idea much easier. You have to look at what concepts and ideas the market understands and what they are used to. We sell our first idea as an additional feature. We were talking to some scouts and it appeared that they didn't have a very high educational level. These people have to use your product

and understand how it works. You have to make sure that the software you build works seamlessly so that they don't switch over to other alternatives. We've delayed our first idea for six months to test and see if our first idea is going to work." (Sporter).

An interesting observation is that the change of the product was heavily influenced by both experts in the field and regular customers to the point that the market introduction phase was delayed. This confirms an observation of Christensen (1997) that the market is not always ready for innovation.

This company changed also the way a company would charge its customers (i.e. their value finance). After talking to some potential clients and experts in the industry, they realized that the initial price would have been too low.

"Then we talked to some football players and they've told us that taking 1% of the transfer sum was a very low price, so we increased our percentage to 3 plus another 3% if a player gets sold by another club and the selling party makes a profit." (Sporter)

Another company also had to revise their revenue model.

"So according to our initial concept, we would charge them around 100.000 euro per year. That's serious

money. The retailers were asking: how do you know that Cooler actually works and how do you know that you can execute your idea? The retailers were not willing to participate for this amount of money". (Cooler)

Another quote confirmed the value of getting information from the market (Hakala, 2010).

"We saw the effect that offering something for free wasn't being valued by our customers. (...) We are not doing it for free anymore, we are doing it for a fixed amount of 99 euro per year" (Cooler)

The latter exemplar is interesting as it shows that the company realized that their success was related to the value they deliver to customers. Revenue model was one of the business model elements that have changed in the business model of this particular firm after engaging with the market.

Taxonomy of firm's behavior

Those two themes combined result in a two-by-two matrix that describes the behavior of companies in developing business models as reaction (or no) to the market. Figure 1 shows this taxonomy. Firm responsiveness varies from low to high responsiveness. Firms that are not responsive make few changes in one or two components of their business model (e.g., adjust their value proposition to the needs of customers), whereas firms with high responsiveness show more frequent

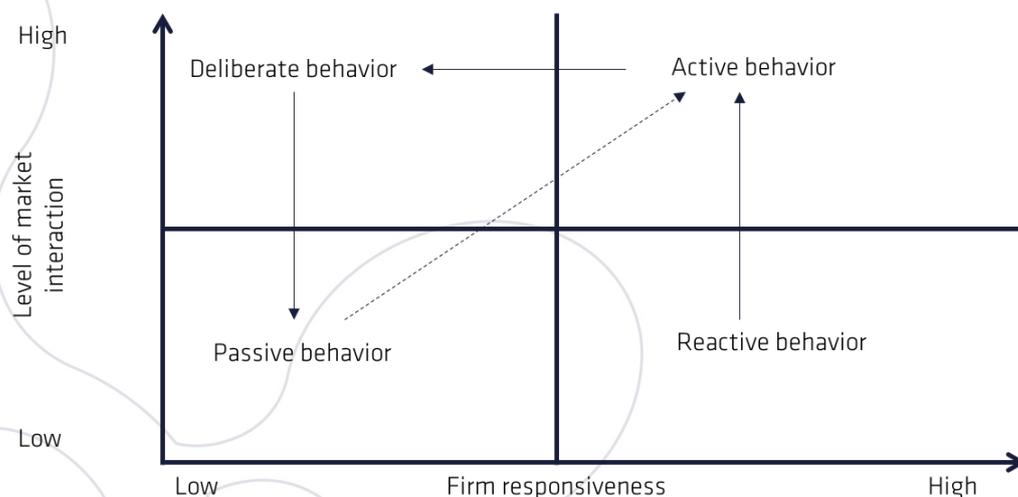


Figure 1. Taxonomy of firm's behavior based on the level of market engagement and firm responsiveness

changes in different elements of their business model (more than just in value proposition). High responsive behavior is indicated by e.g., moving from one market to another and adjusting the product and revenue model accordingly. The concept of market engagement has been discussed above and is concerned with the level of involving customers in providing feedback about the product. Taken together, firm responsiveness and market engagement were used to establish four categories of firm types: passive, active, reactive and deliberate firms.

Passive behavior is characterized by a low to normal level of market engagement by relying on intelligence generating mechanisms such as desk checking, reading publications and monitoring trends. However, firms that engage in this behavior typically do not react to the information generated from these methods, which suggests that these firms may generate market information just to check on market conditions as a kind of “defense mechanism” and only react to the information if it is absolutely necessary.

For example ITech had conducted a small-scale market research project, but the reaction of the firm to this information was not evident. E-Proc also conducted a small-scale formal market research, but the CEO mentioned that the firm did not formulate any new course of action based on information. Although Smarts conducted formal market research and the data suggested that the firm should target the hotel market, the firm did not follow through on the data. The firm instead targeted the hospital market because customers from the hospital market approached the firm to build software for them and because Smarts thought it would be easier to execute against the hospital market’s requirements.

Active behavior is characterized by a medium to high level of market engagement by relying on intelligence generating mechanisms such as customer meetings, small-scale product testing and using customer case studies. These firms react to the information they obtain from these intelligence generation methods, which suggests that these firms change their business model or continuously fine-tune their product offering. We classified River, Sporter, Marker, Cooler and E-Proc as active firms in the market validation, product devel-

opment and business-scaling phases. River has revised their product features and revenue model according to customer case studies and small-scale product testing. Cooler engaged in rigorous customer discussions and adapted its value finance two times on the basis of customer feedback of consumers (first quote) and customers (second quote).

“We saw the effect that offering something for free wasn’t being valued by our customers. (...) We are not doing it for free anymore, we are doing it for a fixed amount of 99 euro per year” (Cooler)

“So according to our initial concept, we would charge them around 100,000 euro per year. That’s serious money. The retailers were asking: how do you know that Cooler actually works and how do you know that you can execute your idea? The retailers were not willing to participate for this amount of money”. (Cooler)

Marker responded to the idea of the market, customers and strategic partners and changed their initial product concept development.

“We noticed that indoor navigation is difficult (...). In these though economic circumstances it is hard to sell ‘nice-to-have’ things. (...) Yes. We have heard it from customers and also from companies that help us in delivering our product. For instance, companies that sell our product, like installation firms and firms that sell office space. We noticed that the market for our initial idea was not really feasible”

Marker engaged in multiple customer discussions to validate interest expressed by retailers and acted on the information by targeting the retail market with a different product.

Reactive behavior is characterized by a low level of market engagement and a high level of firm responsiveness. This means that these firms react to information gained from desk checking and formal market research. These firms mainly use to this kind of broader market information to determine the viability of the market before moving into it and to bring focus to their product concept. However, constantly reacting to information generated from desk checking may not be always be a wise idea, since it can lead to many new un-

tested (with customers) business models. Firms that do not test their business model in the market through customer meetings remain reactive, since they change their initial business model frequently without making the decision to pursue one specific business model. An example from the interview data is the firm River that reacted to information generated by desk checking to move away from their initial target market into another market that was less crowded with competitors. This event occurred in the idea generation phase.

"I looked at the market and found that doing ride sharing groups is difficult, it's been attempted before. Technology-wise it was an interesting step in innovation to make there, but I looked at the market forces and basically decided that it would be quite difficult to execute if not impossible, so I've looked for other area in this sector to solve problems. You might hear this a lot, but we've moved through a few different iterations of the idea from when I first came up with things in my head to when I actually started to write code and develop a product". (River)

However, this firm didn't dwell too long in the idea generation phase and moved into the market validation phase.

Deliberate behavior is characterized by a high level of market engagement by using small-scale product test-

ing and no react to the information obtained from this activity unless it is not absolutely necessary. The reasons for not reacting may be that the firm is currently executing a well-established product strategy and has no room to consider alternatives. This could lead to very small changes in a firm's business model component if it is necessary. Smarts is an example of a deliberate behavior. It was in the product development phase and nearing the market introduction phase when the firm learned from a lead user that the user interface was not appropriate for that category of user. Smarts decided last-minute to change the user interface of the program, because otherwise, the product would likely receive negative feedback after launching it in the market.

"One month before the opening of the hospitals our interfaces were ready, everything was approved. And we got this email from somebody we never heard of before saying: this will not work, and lots of criticism. (...) He said the interface was for an IT company, would not work for a nurse. (...) We made an interface for nurses". (Smarts)

Development of market-oriented business models over different stages of development

We observed a pattern of behavior over various stages of development as seen in figure 2.

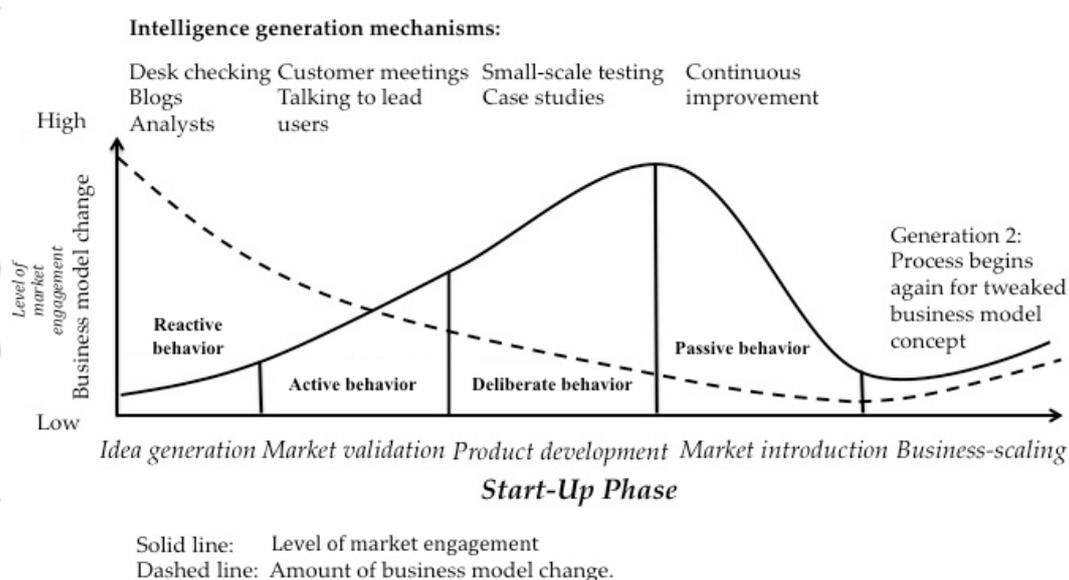


Figure 2 Integrated framework of business model dynamics

We found that the behavior of firms changes over time from first being reactive and finding the right idea for a product and a business model that would capture value from it. We observe that experimenting with business models is high in the first phases and to almost diminish in the market introduction phase. Also engaging the market changes over time from first being less engaged towards more interaction with customers and/or users.

In the idea generation phase firms are rather developing ideas within the firm and experiment with their business model that might lead to changes in all four components of the business model, including the value proposition, value architecture, value finance and value network. Here, firms interacted with the market to determine their entire business model, instead of limiting market engagement to construct one component. This type of firms was classified as a reactive firm that is at the beginning of constructing its business idea or business model. Typically, these firms did not engage the market on a high level, because they did not have a fixed business model to validate in the market. These firms mainly used desk-checking techniques to see whether it was viable to pursue an opportunity with a new business model. If it turned out as not viable to exploit an opportunity with a business model that the firm had in mind in the first place, firms chose to pursue a different market opportunity with an entirely different business model. Firms could change their business model so drastically in this phase, because they did not make a commitment to their business model by executing it. The interview data suggests that the firm River fits this profile. River went through different ideas and concepts in the idea generation phase, which also led the firm to reconsider their value proposition, value finance, value architecture and value network. Other firms did not change their entire business model so drastically in the idea generation phase.

Later in the process, we saw firms change one or two components of their business model driven by reaction to medium market engagement. Firms tried to validate their initial idea of a business model by engaging in interactions with customers. Marker, Sporter and Motile changed their business model in terms of the value proposition in the market validation phase, which was mainly influenced by arranging customer

meetings and discussing product features. Sporter and Motile also changed their value finance in the market validation phase, since some customers gave feedback on the charging methods used by both companies. We found that the more active companies became in interacting with the market, the more detailed information they can get to fine-tune their initial business model. The components that changed the most in the market validation phase were the value proposition and value finance.

In the product development phase firms would typically develop their product further that has probably been revised already after interactions with customers. In this phase startups tend to engage their customers to further tweak their offering or revenue model. They might get feedback through small-scale testing on product details or on specific charging methods that the company was using. That was the case with River, Cooler and Smarts. River iterated their product in terms of product features by using small-scale pilot testing. Furthermore, River's CEO mentioned that changes in product features might also influence changes in the firm's revenue model. The company was still revising its revenue model based on small-scale testing. Cooler fine-tuned their revenue model through rigorous customer discussions. Smarts tweaked their product by replacing the old user interface by a different user interface, which would be better suitable for their target market according to customer feedback. After the market introduction phase Cooler worked on a version 2.0 of their app and fine-tuned their value proposition. Alife also made small revision in the revenue model by selling individual hiking routes rather than bundles, because customers didn't prefer to pay the price for bundled routes. An interesting case was ITech who their product portfolio by introducing vibration monitoring as a result of customer feedback and information exchange during product fairs. In this way they expanded into a new market and needed to adapt their value architecture and value network. They did not change their business model but rather developed a new one thus started the process of market engagement and responsiveness all over again.

Established companies in the business-scaling phase did not experiment with their business models much as observed in E-Proc and Alife. We only saw tweak-

ing the value proposition element by these companies. The reason for this phenomenon could be that young startups, which do not have a product that has been validated yet by the market, adjust and fine-tune their

product offering, while established companies adapt an existing business model that needs refinement, because of changing market conditions or legal barriers, like the case of the company IT.

Table 2: Firms' actions in various development stage.

Development stage	Examples of actions	Firm
Idea generation	<p>Market engagement</p> <ul style="list-style-type: none"> • River used desk-checking and research data to quantify the market size and number of competitors in the market. • Motile before expanding into a new market, searched the Internet for market data. • Smarts have conducted formal market research on a small scale to keep track of industry trends. • Sporter has used news blogs and social media to keep track of industry trends. 	River, Motile, Sporter, Smarts
	<p>Business model experimentation</p> <ul style="list-style-type: none"> • Developing value proposition based on scientific projects (Smarts on smart cities; ITech on motion sensor) or master's thesis project (Sporter on selecting football players). • Getting ideas what potential competitors do and what they charge for similar products • Scanning the market for products fulfilling similar needs • Alife's value proposition was a result of a gap on the market. • River changed its value proposition from ride sharing to a taxi driver intelligence system targeting taxi drivers. 	Smarts, Sporter, Alife, River, ITech
Market validation	<p>Market engagement</p> <ul style="list-style-type: none"> • Marker, River, Sporter, Motile and Cooler arranged meetings with potential customers and talked to lead users about product features and gained insight in how customers want to be charged for the product. 	Marker, Sporter, Cooler, Motile, River
	<p>Business model experimentation</p> <ul style="list-style-type: none"> • Determining customer interests by targeting initial customer segments and bringing focus to the product. • Sporter decided to postpone the initial idea (selecting football players in a club's transfer list that would fit a football team's characteristics in the most appropriate way) and work on a new value proposition, which was about determining an initial transfer list for football clubs. • Sporter revised their revenue model during the early market validation phase and increased the re-sale value percentage of football players • Cooler's revenue model changed from an initial monthly subscription-based revenue model in combination with activation fees to a one time fixed fee without activation fees to an entirely free service for the first couple of advertisements and eventually a model that is similar to online advertising models where customers are being charged on the basis of cost per list view, cost per e-mail and cost per detail view. As they grew they hired more employees (value architecture) The business model required a change in value network: new investors and advertising partners. 	Sporter, Cooler

Product development	<p>Market engagement</p> <ul style="list-style-type: none"> • River and Alife used small-scale testing/ prototyping to fine-tune product details. River used a case-study approach to determine what to precisely charge customers. • The CEO of Smarts mentioned that they were approached last-minute by a customer who gave feedback on the user interface. 	River, Alife, Smarts
	<p>Business model experimentation</p> <ul style="list-style-type: none"> • Fine-tuning product features by small-scale product testing. • Using a 'dummy app' to convince potential customers before market introduction. • Finding the right pricing model according to a case study approach. • River's revenue model is subject to continuous change influenced by the product's feature set and the results of its ongoing case study. 	Sporter, River
Market introduction	<p>Market engagement</p> <ul style="list-style-type: none"> • Sporter used small-scale testing of software updates. • ITech gets continuous feedback from users. • Alife used app store reviews to reconsider their offering on trials and charging methods. • Cooler used blind tests and focus groups to fine-tune the app after market introduction. 	Cooler, ITech, Sporter, Alife
	<p>Business model experimentation</p> <ul style="list-style-type: none"> • Sporter refused to build custom apps for certain customers after the market introduction phase, because of potential scalability issues. • Cooler's value proposition did not see a drastic change, other than added product features after launching the app in the market. • Smarts intends to grow and to make tailor-made solutions for customers to test new possible markets (value proposition & value finance). 	Sporter, Cooler, Smarts
Business scaling	<p>Market engagement</p> <ul style="list-style-type: none"> • ITech conducted formal market research on a small-scale to monitor industry trends. • E-Proc started with internal discussions to refine their business model and talked with potential customers to validate the new business model and also engaged in small-scale testing after this process. • Cooler started with internal discussions about new product features and charging methods for the 2.0 version of the app. • Developing initial prototypes to let potential customers test it. • ITech started testing a new value proposition with new customers (after introducing new business model the process of market engagement started again). 	E-Proc, Alife, ITech, Cooler
	<p>Business model experimentation</p> <ul style="list-style-type: none"> • E-Proc still provides its customer with procurement software, but has added new product features to its value proposition and a new customer segment as they have an ambition to grow. The company now serves the entire value chain from supplier to buyer with a newly develop E-Proc Network. Also, it now provides basic, plus and complete software-as-a-service packages to different types of customers. E-Proc initially charged its customers a high fixed price for a software module in the form of a server license and a yearly maintenance fee. It has changed this model into a pay-as-you-go/ pay-per-use model without an initial start-up fee. • To expand (their current market is growing very slowly), ITech needed a new business model with new value proposition and new market (industrial applications). They also expanded their value network to new partners. 	E-Proc, ITech

Discussion

In this paper we examined whether young (startups and established) entrepreneurial IT firms change not only their value proposition but also other elements of their business models. We looked at a specific industry that is very close to the market and often works with the principles of a lean startup. One of the main aims of this research was to explore to what degree reacting to market information and engaging with the market actually led to changes in a firm's business model as suggested previous research (Al-Debei and Avison, 2010; Hakala, 2010; Osterwalder, 2004; Plé, Lecocq and Angot, 2010). To analyze this behavior we propose taxonomy based on the dimensions of market engagement and firm responsiveness resulting in four types of behavior: reactive, active, deliberate, and passive.

Our study shows that firms change certain business model components and the impact of the change in business model varied for different firms and in different phases of business model development confirming previous research (i.e., Sosna et al., 2010; Bigdeli, Li, and Shi, 2015). Although the interviewed companies did not all change their business model in one specific business model development stage, it can be observed that most of the interviewed startups made adjustments to their business model in the market validation phase.

The most distinguishable business model changes in the companies occurred in the value proposition and value finance components. Examples of business model change in these companies were for instance adding requested features to the product according to customer suggestions, adjusting product details according to small-scale testing of software updates, changing the target market of the company, positioning the product away from the competition or revising product price and the method that companies use to charge customer e.g. monthly subscription fees, fixed fees or activity-based online revenue models. These findings suggest that software startups focus mainly on getting the value proposition and value finance right in the market validation phase. A reason for this might be that startups develop their value network and value architecture after the core product and target market were made valid in terms of financial viability. For the reason of financial viability it is important to involve

the market in the first stages of business development to target the right market with the right value proposition. Also the value proposition might influence which partners and which competences are necessary to deliver the validated value proposition to customers. Changes in terms of the value network and value architecture, as a direct result of market engagement did not occur as often as changes in terms of value proposition and value finance. In other words, while market engagement might not have a direct impact on the value architecture and value network, these elements of the business model are still subject to change due to the interdependent nature of the value proposition and value finance with these components. However, it was observed that mostly established companies expanded on the number of full time employees over time, whereas startups generally consisted of three to five full time employees until at least the market introduction phase.

Implications for practitioners

IT companies that adapt their value propositions and their business models based on market engagement are likely to have higher levels of performance in terms of operation success and reducing time to market than those that do not. The results of our research have practical implications, particularly for companies that operate in rapidly changing competitive environments like the IT industry. Our research shows that business models do change over time (Demil and Lecocq, 2010). The extent of business model change depends on the types of behaviors the firm adopts (passive, active, deliberate and reactive) and where in the phase of development the firm is. Firms can use different behaviors over time as they move through these phases of development.

Changing the business model is essential for success and survival. Firms will be able to take advantage of new opportunities and expand their products and services. Other firms may pivot into different market spaces than originally intended (Smarts) but by doing so, rapidly decrease the time to market. By understanding the broad changes in the level of sophistication and technology that consumers have, firms can find different paths to market (i.e., app vs. PDA, Alife) that have a less expensive and more efficient business model. By changing mode of delivery, Alife also increased its

market segment from a narrow niche to a mass market. Revenue models and value propositions can also change based on feedback from experts and customers (Sporter). In sum, Figure 2 shows some useful business intelligence mechanisms that can be employed depending on which phase of development the firm is. It can serve as a toolbox for firms that want to experiment with their business models to fit into their markets. We anticipate that this cycle will ebb and flow as new products are introduced and the firm moves into new market spaces.

Implications for theory

Our research fills a gap in the literature by exploring the role of market in the development of young entrepreneurial IT startups' business models over time. We propose a framework allowing an analysis of business model changes in different stages of firm's development. This framework of market-driven business models delivers a set of conditions for firms to experiment with business models. Previous studies have shown that market orientation increases firm's performance (Narver and Slater, 1990; Han et al., 1998; Grinstein, 2008); however, these studies focused on new product development and not on the development of business models. This paper also answers the call for research of Priem et al. (2013) on consumer-driven business models that focus on strategies of firms emphasizing value for customers. The results of this research support previous studies (Achtenhagen et al., 2013; Chesborough, 2010; Demil and Lecocq, 2010; McGrath, 2010; Teece, 2010) that business models are dynamic and change over time. We follow up on the idea of CIBM by Plé et al. (2010) and add to the research of Sosna et al. (2010) by exploring the stages of business model development and focusing on including the voice of the customer into the process. We observe and report on the different patterns of behavior of companies in different stages of development. As the literature on business models often deals with established firms (even though the concept is used for startups by practitioners), we shy the light into the development of business models by startups as the majority in our sample are startups. So far, few studies analyze how business models of startups evolve over time (Bigdeli et al., 2015).

Our conclusion based on the results is that young entrepreneurial IT startups should involve their market

in the development of their business models early in the development phase. This conclusion goes back to Moore (1991) who advocated involving customers and creating relationships with customers in developing high tech products or services. In view of a recent study by Bigdeli et al. (2015), an interesting observation is that firms in our sample change their business models most in the early phases of the development. Bigdeli et al. (2015) analyzed university spinoffs and found that these spinoffs were changing their business models over longer time – until the scale up phase. This difference can be explained by differences in products and industries, but it can also be explained by the early engagement of the market in the development of business models. As we claim in this paper, any startup should validate their ideas before making investments.

Limitations and future research

This study has several limitations. Firstly, the sample size restricts generalizability of the results. We observed various changes in the behavior of IT startups, however, to falsify our results a larger study should be performed. We suggest that future research build on our findings to include larger samples of firms capable of handling different analysis, and different methods of collecting customer and market input. For the same reason, generalizability of the results to other contexts cannot be claimed. Our sample consisted of IT startups. In different industries, the dynamics are likely different. In the IT industry where change is rampant and is likely to be more significant whereas in a mature industry like food, change is more likely to be incremental. We suggest that other industries including low and high technology will be included in future research.

The change of business models seems to impact performance. Besides increasing sales, firms can get to market quicker, make their business models more efficient, and if they are quick enough in changing, they can take advantage of being the first mover in the new market space. Future research should look more closely at the performance implications of changing business models. Our assumption for future research is that certain types of behavior will lead to differences in performance this being e.g. faster time to market, success. Zott and Amit (2008) showed that strategy and business model can predict perceived firm's performance. We also acknowledge the lack of longitudinal data col-

lection. More longitudinal research such as Achtenhagen et al. (2013) and quantitative is called for that should more closely examine the business model change and subsequent impact on firm performance.

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