

## **Exploring business model dynamics using the market interaction perspective.**

*How does market interaction and firm responsiveness affect changes in a firm's business model?*

### **Abstract**

*This paper is aimed at filling a gap in existing business model literature with regards to the role of market orientation and customer involvement in constructing or adapting business model building blocks. This research explores how business models change during different phases of the business development process as a result of how firms interact with the market. There are three key findings in this research. Firstly, startups and SMEs tend to use different intelligence generation mechanisms and interact with the market differently depending on the business development phase they are in. Secondly, firms can be classified in terms of their responsiveness to market interaction in different phases, resulting in unfocused, active, focused and passive firms. Finally, the impact of firm responsiveness on the business model varies between changes in all four blocks of the business model, one or two blocks in the business model or details in one building block.*

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## **1. Introduction**

Rapid technological developments and increasing marketplace dynamics drive companies to capture value from new user experiences by developing new business models (Kijl et al., 2005). A business model explains the logic of how a business creates and delivers value to its customers (Teece, 2010). Moreover, companies need to develop the capability to innovate their business models, because the economic value of a technology remains invisible if it's not commercialized in the appropriate way (Chesbrough 2010). Business model innovation often begins by identifying a viable value propositions for a specific customer segment and configuring the value network, value finance and value architecture to deliver customers value (McGrath, 2010; Chesbrough, 2010).

Authors like Al-Debei (2010) and Osterwalder (2005) have already addressed the issue of developing a unified business model architecture by identifying fundamental aspects and dimensions of the business model through an extensive literature review. However, recent business literature has not tackled the issue of market orientation and customer involvement in business model dynamics so far (Plé et al., 2010). In current business model literature, customers are seen as the target audience for the firm's value proposition, instead of a valuable actor that is involved in the process of helping firms in defining their product offering, revenue model, value network or value architecture (Osterwalder, 2005). Therefore, customers are generally seen as actors at the end of the production and distribution process in the form of output receivers without any role of being a content-generator (Yip, 2004). Other authors argue that customer participation might influence a firm's value proposition and other building blocks of the business model, but state that this is an underexplored area of the business model literature (Plé et al., 2010). These authors have made the first efforts of treating customers as a resource integrated in the business model framework of firms (Plé et al., 2010). From a resource-based view standpoint, being customer-oriented helps firms to collect and respond to market intelligence and deliver superior customer value (Zhou et al., 2005). In co-creation literature, customers have been described as a valuable source in a firm's new product development process (Von Hippel, 2002; Prahalad and Ramaswamy, 2004). Customers can be a source of co-innovation in the whole development cycle of a new product (Hoyer, 2010), which in turn can lead to product innovation (Verbees et al., 2004). While the role of customer co-creation is acknowledged in business literature for the NPD process of firms, this research aims to explore if the co-creation process can be extended to different elements of the business model framework, which consists of the value proposition, value architecture, value network and actors (Al-Debei and Avison, 2010).

Firms can also make use of broader market information, instead of only relying on customer input (Jaworski and Kohli, 1990). This stream of literature stresses the importance of generating market intelligence about customers, competitors and broader market conditions in order to create superior sustainable value (Narver and Slater, 1990). An important concept here is firm responsiveness towards the generated market intelligence, where Jaworski and Kohli (1990) argue that organizations can generate market intelligence, but unless firms respond to market needs, very little is accomplished. Usually, firms react to market information by changing their value proposition in terms of product design and target market, but the impact of responding to market intelligence by changing other elements of the business model framework has not been studied sufficiently in business model literature.

This research explores how engaging the market changes a firm's business model. However, this study focuses itself on business model innovation on the organizational level, instead of the industry level, due to the focus on explaining the process of co-creation rather than the effectiveness of the newly developed business models in the industry.

## **2. Theoretical background**

### ***2.1 Business model dynamics***

While business model literature has addressed the issue of describing and capturing the business model concept, the issue of business model dynamics lacks significant empirical evidence and conceptualization (Achtenhagen et al., 2013, p. 2). To achieve sustainable value creation, firms must adapt their business model to cope with changes in the competitive environment or else they risk failing in the marketplace (Doz and Kosonen, 2010). According to Osterwalder and Pigneur (2010), sustained value creation depends on successfully shaping, adapting and renewing a firm's business model framework on a regular basis. In addition, Demil and Lecocq (2010) found evidence that business models are dynamic, because of the interactions between the different building blocks.

#### ***2.1.1 Business model innovation and experimentation***

Chesbrough (2010, p. 354) argues that firms need to develop the capability to innovate their business model, because a similar technology may be more valuable if it's exploited with the right business model. Technological innovation often needs to match business model innovation if the innovator wants to capture value (Teece, 2010). The chances of designing a good business model are greater if managers have a deep understanding of user needs and are fast learners. Business model innovation, if sufficiently differentiated, can be a way to achieve competitive advantage. Designing a new business model requires creativity and information about the customer, supplier and competitor (Teece, 2010). However, the right business model might not be apparent from the beginning and depends on learning and trial and error adjustments. Teece (2010) highlights the role of discovery learning and adaptation in the process of business model innovation. Furthermore, Teece (2010, p. 189) suggests that a business model should be evaluated against its current ecosystem of suppliers, competitors and customers and against how the ecosystem may evolve.

Business model innovation is associated with configuring the business model dimensions in a new way to capture value from a technological innovation (Chesbrough, 2010). Furthermore, Chesbrough (2010, p. 361) identifies barriers to business model innovation caused by the success of the institutionalized way of exploiting an established technology. However, continuing to exploit the established business model can lead firms to miss the potential value of exploiting new technologies with a refined business model (Chesbrough, 2010, p. 359). Barriers to business model innovation can be overcome by effectuation and experimentation (p. 362). Actors in effectuation processes, take action instead of relying on a pre-analysis of the market. Effectuation triggers business activity as a result of generating new data from interviews with potential customers or real-world experiments with new products (Sarasvathy, 1996). Similar to experimentation and effectuation is discovery-driven planning, which enables companies to evaluate key assumptions that have been made in a business model by further experimentation and adapting the initial business model. This process is driven by updated results of the economic viability of previous assumptions that were made in constructing the new business model (McGrath and MacMillen, 1995). In addition, Ries (2011) proposes the lean startup method, which is based on testing business-hypotheses, product iteration and validated learning to shorten the product development cycle and reduce market risks before moving into the next stages of business development.

These experiments provide firms with necessary information on when it's the most appropriate time to shift resources from established business models into new business models. Finding a balance between the old and the new business model is a crucial act for firms in a turbulent marketplace (Chesbrough, 2010, p. 362).

Achtenhagen et al. (2013) argue that the capabilities that drive successful business model change over time haven't been developed in business model literature. Therefore, Achtenhagen et al. (2013, p. 3) investigated what strategizing actions capabilities and activities are necessary for achieving successful business model change over time. The authors combine the dynamic capability and strategy-as-practice theoretical perspectives to identify micro-foundations of business model dynamics. The dynamic capability perspective is concerned with firm-specific capabilities that enable a firm to shape and adapt to its environment (Teece et al., 1997). The dynamic capability perspective is suitable to analyze business model dynamics over time, since dynamic capabilities are evolutionary.

Complementary to the dynamic capability perspective is the strategy-as-practice perspective, which focuses on identifying firm activities and outcomes rather than capabilities (Johnson et al., 2007; Regnér, 2008).

Achtengahen et al. (2013) conducted a longitudinal study and employed an in-depth analysis of 25 SMEs to explore strategizing actions, capabilities and activities, which lead to business model change and sustainable value creation. The authors found six strategizing actions and three critical capabilities that support the value creation process namely identifying, experimenting and exploiting business opportunities, using resources in a balanced way and balancing a strong organizational culture with employee commitment. The authors conclude by explaining that firms can reinforce complementarities by combining strategizing actions with critical capabilities to achieve sustainable value creation (Achtengahen et al., 2013, p. 17). An example is to balance resources and build on employee skills when expanding into new markets (p. 18). On another note, the authors also found that firms that execute incomplete initiatives and unsystematic changes can deteriorate financial performance (p. 18).

### *2.1.2 Business model development stages*

Similar to Achtengahen et al. (2013), Kijl et al. (2005) argue that the relation between the business model concept and external influences is missing in the business model literature. The authors try to identify dynamic phases, key decision moments in changing the business model and external influences that drive business model change or have a disruptive effect on a firm's business model (Kijl et al., 2005, p. 4). The authors also classify the type of innovation that is at the root of a firm's business model. A distinction is made between incremental versus radical innovation. Both radical and incremental innovations can lead to changes in the building blocks of a firm's business model. If the capabilities to exploit new technological opportunities are radically different than the existing resources and capabilities of a firm, than the change can be classified as radical for the organization (Kijl et al., 2005) Furthermore, Kijl et al. (2005) identify three phases in which the business model is subject to change. In the research and development phase, the firm is concerned with developing an alpha version of the product and developing new technologies. In the implementation phase, the firm is concerned with rolling out its services on a small scale and further beta testing. Finally, in the market phase, the focus lays on commercial exploitation after a successful rollout phase and an increasing adoption of the service.

The external influences on business model change identified by Kijl et al. (2005) are technological, market and regulatory influences. The authors stress the fact that market factors are an important external influence, which can change a firm's business model, because market dynamics form the basis for the existence of a product or service. Because the customers have a tendency of changing their priorities, business models should be dynamic from the beginning and reflect the customer's need in that period of time.

Following on the issue of the dynamic business model, Sosna et al. (2010) pose the question of how established organizations can innovate their existing business model driven by changes in its external environment. The authors have studied the antecedent and drivers of

business model innovation by conducting an in-depth and longitudinal case study of Naturhouse, a Spanish firm in the dietary product market. The authors have studied this firm to gain insight in how its business model has changed over time.

Sosna et al. (2010, p. 384), like Achtengahen et al. (2013) and Kijl et al. (2005), view continuous business model innovation as a dynamic capability to react to market changes and survive in the longer term. Sosna et al. (2010, p. 384) seek to contribute to the emerging view in business literature, which considers business model development as an experiment, followed by revision and adaptation based on trial and error learning. Trial and error learning is characterized by its iterative nature of experimentation and retaining actions that produce wanted results and discarding actions that produce negative results (Argyris and Schön, 1978). The results of Sosna et al. (2010) show that the metamorphosis of Naturehouse's business model can be categorized into four different stages: initial business model design and testing, business model development, scaling up the refined business model and sustaining growth through organizational learning (Sosna et al., 2010, p. 388-396).

In the first stage, firms react to the difficulties they are facing by experimenting with a new business model on a relatively small scale. The next phase is about testing the market acceptability of a firm's value proposition and adapting the business model to environmental circumstances and competition in the market. Once a viable business model has been developed, the accumulated knowledge must be integrated into the whole organization and should be prepared for scaling. Finally, the business model should be exploited through scaling up the business model, but firms should also pay significant attention to further exploration of new business models to achieve sustained value creation. The future viability of the business model can be diminished by environmental circumstances or by replication by competitor firms (Sosna et al., 2010, p. 396).

### *2.1.3 Business model ontology*

This study employs the business model ontology developed by Al-Debei and Avison (2010, p. 35). The authors identify four primary dimensions of what constitutes a business model with their constituent elements based on a hierarchical taxonomy as a result of a comprehensive literature review. The business model is fundamental to an organization, because the business model describes the architecture of value creation, delivery and capturing mechanisms that contribute to commercializing new ideas and technologies (Teece, 2010; Chesbrough, 2010). The four value dimensions or building blocks identified by Al-Debei and Avison (2010) are the value proposition, value architecture, value network and actors. Business model innovation can result from reinventing the established value proposition, existing customer base, deconstructing traditional value networks and the firm's role in the existing value chain (Magretta, 2002; Govindarajan and Gupta, 2001).

The value proposition is defined as a way that demonstrates the business logic of creating value through offering products and services that satisfy the needs of the target segment (Osterwalder et al., 2005). Value propositions force organizations to focus on what their offerings are really worth to their customers (Osterwalder, 2004). The value proposition dimension of the business model should include a description of a firm's products/services or offerings to its customers (Al-Debei and Avison, 2010, p. 367). Furthermore, the value proposition needs to describe the value elements incorporated in a firm's product/service offering. In addition, the value proposition should also incorporate a firm's target market segments to which the value elements are directed. Hoyer et al. (2010, p. 283) state that the degree of customer participation could differ throughout different stages of the NPD process. Hoyer et al.'s (2010) statement may also be relevant for the life-cycle stages of the value proposition.

The value architecture is defined as the technological and organizational architecture that allows the provision of products or services (Venkatraman and Henderson, 1998).

The foundation of the value architecture is the resource-based view (Barney, 2001) and consists of resources, inputs, core competencies and value configuration (Hedman and Kalling, 2003).

The value network is defined as way in which firms enables transactions through collaboration among multiple partners and companies (Andersson et al., 2006; Rappa, 2008). The value network consists of actors (Pisano and Verganti, 2008) which have different roles and relationships between different stakeholders through which they exchange communication and value (Gordijn et al., 2000).

Finally, value finance is defined as a way in which organizations organize issues related to costing, pricing and revenue streams (Osterwalder, 2005; Shafer et al., 2005).

Furthermore, Al-Debei and Avison (2010, p. 368) highlight the importance of the fact that the primary dimensions of the business model are interrelated and interdependent. The authors argue that designing a business model requires a balance of conflicting design requirements of the business model building blocks. Al-Debei and Avison (2010, p. 368) give the example of companies that adapt their value proposition to fit customer wants and needs, which in turn influences the companies' value architecture. Moreover, the value architecture of a firm is dependent on the external resources that a firm acquires from its value network. Finally, the financial arrangements regarding the three business model dimensions can also be influenced if the formulation of the business model dimensions change.

## ***2.2 Market engagement***

This study combines both the market orientation and customer involvement literature streams to capture an inclusive view on how firms engage the market and use customer and competitor information in developing their value proposition and potentially other parts of their business model. Market orientation is defined as a firm's ability to understand and make use of the knowledge it holds about its customers, competitors and markets (Hakala, 2010, p. 201). Customer involvement is more about using customer feedback in the new product development process and is described as the information transfer from customers to the firm in which new ideas are jointly co-created and commitment to action is established (Lundkvist and Yakhlef, 1998).

### ***2.2.1 Market orientation***

Market orientation covers the adaptive process of analyzing and reacting to changes in customer behavior and competitors in the marketplace (Hakala, 2010). Market oriented firms are interested in turning valuable external market knowledge into actions and exploit new market opportunities (Hakala, 2010).

In general, two approaches to studying market orientation have been used in literature (Shoham et al., 2005). One approach splits market orientation into three different elements, like customer orientation, competitor orientation and inter-functional coordination (Narver and Slater, 1990). Narver and Slater (1990) define the concept of customer orientation as the sufficient understanding of one's target buyers with the aim of creating sustainable value. In order to be customer oriented, firms must understand whom its current customers are, but also understand who these customers might be in the future. Narver, Slater and MacLachlan (2004) found that it is necessary for customer oriented firms to understand the entire value chain of the customer, as well as how the value chain will evolve over time under the influence of external market dynamics (Narver and Slater, 1990). Identifying and satisfying latent customer needs is defined as a pro-active market orientation (Narver et. al., 2004). In

contrast to a pro-active market orientation, a responsive market orientation is concerned with understanding and satisfying expressed customer needs.

Competitor orientation is described as the sellers' understanding about the short and long term strengths and weaknesses of (potential) competitors (Narver and Slater, 1990).

Inter-functional coordination is defined as the coordinated utilization of company resources to deliver superior customer value. Hereby, it is important to note that creating superior value for customers is not only the task of the marketing department, but can be extended to all functions in the organization. Although Narver and Slater (1990) mention inter-functional coordination as part of the market orientation construct, this research will not be focusing on inter-functional coordination, because small startups and SMEs generally do not consist of a large number of business departments, which necessitates extensive internal coordination.

Another approach considers market orientation as intelligence generation, intelligence dissemination and responsiveness (Jaworski and Kohli, 1990). Jaworski and Kohli (1990) argue that market intelligence is not only concerned with customer surveys, but also meetings and discussions with customers and trade partners and through formal market research.

Intelligence generation also includes monitoring broader exogenous factors, which influences customer needs. Similar to Narver and Slater's concept of inter-functional coordination, intelligence dissemination will not be examined in this research, because information is spread rapidly between employees in small startups and SMEs, since there are no clear boundaries with regards to functional departments.

The most notable difference between the two approaches towards market orientation is that Jaworski and Kohli (1990) include the element called responsiveness in the market orientation construct, which is different than Narver and Slater's (2004) responsive market orientation in the sense that responsiveness doesn't make a distinction between expressed or latent customer needs. Responsiveness is concerned with taking action and reacting to generated market intelligence by selecting target markets, offering new products to customers or changing the way firms produce or distribute their products according to newly obtained market information (Jaworski and Kohli, 1990). Unless firms react to market intelligence, very little is accomplished according to Jaworski and Kohli (1990). Homburg et al. (2007) have studied the mechanisms that drive firm responsiveness of customer oriented and competitor oriented firms. However, these authors have focused on measuring firm responsiveness as the speed of reaction to customer or competitor information, instead of determining the impact that firm responsiveness may have on the business model. The impact of firm responsiveness on the business model framework remains an underexplored area in business model literature.

### *2.2.2 Customer involvement*

Customer involvement includes many concepts from different literature streams and is mainly concerned with the information exchange between customers and firms during various NPD stages to improve the effectiveness of the NPD process by achieving a more favorable cost/time development curve and reducing risks associated with the innovation process (Lundkvist and Yakhlef, 1998; Alam, 2006)). Customer involvement includes customer co-creation (Von Hippel, 2002, Von Hippel, 2005; Hoyer et al., 2010; O'Hern and Rindfleisch, 2009) and customer participation (Plé et al., 2010; Vargo and Lush, 2008).

Von Hippel (2005) stresses the importance of information asymmetry that occurs in the NPD process. Typically, customers have the most accurate information about their needs, whereas manufacturers have accurate knowledge of how to solve these needs. According to Thomke and Von Hippel (2002), firm's can bridge the phenomenon of information asymmetry by engaging their customers more proactively in the NPD process. Innovation by customers is mostly the effort of lead users (Oliveira and Von Hippel, 2009). Lead users are characterized by being ahead of the market with regards to a certain trend and their expectations of gaining

advantage from solutions for the problems they encounter (Oliveira and Von Hippel, 2009, p. 8). Lead users are essential for firms in high technology industries, which are operating in highly dynamic and complex environments (Von Hippel, 1986, p. 796). Von Hippel (1986) proposes that lead users, who have real-life experiences with new products, are essential for conducting accurate marketing research. Furthermore, Lundkvist and Yakhlef (1998) suggest a conversational approach to customer involvement in which information and ideas are exchanged during conversations with customers.

Hoyer et al. (2010, p. 283) focus on the degree of consumer co-creation in new product development. The authors observe the impact of co-creation at the ideation, product development, commercialization and the post-launch stages of the new product development process (p. 283). Involving customers in the early stages of the NPD process can save time and expenses and reduce the risk of the product being a failure (p. 290). Customer involvement in the later stages of the NPD process can serve as an early warning to prevent the diffusion of negative opinions about the new product. However, firms can also experience impediments for co-creation, because of information overload and intellectual property concerns (p. 289). Similar to the findings of Hoyer et al. (2010), Kaulio (1998) found that different methods support the involvement of customers at different phases of the design process. The author identifies three product development phases namely the specification phase, concept development phase and the prototyping phase in which methods like concept testing, beta testing, QFD, user-oriented product development, consumer idealized design, participatory ergonomics and lead user methods can be used.

Furthermore, O'Hern and Rindfleisch (2009) develop a customer co-creation typology and identify four types of NPD contributions. These NPD contributions vary in term of openness and being customer-led or firm-led (O'Hern and Rindfleisch, 2009, p. 89). Following these criteria, the four identified NPD contributions are collaborating, tinkering, submitting and co-designing. Collaborating is defined as a process in which customers have the power to collectively develop the core components of a product. Tinkering is a process in which customers make small modifications to a commercially available product. Co-designing is defined as a process in which a small group of customers provides a firm with new product designs. Finally, submitting is defined as a means of direct communication of new product ideas between the customer and the firm.

Plé et al. (2010) identify customer participation as actions of customers that are linked to the production of a good or service. Vargo and Lusch (2008, p. 8) identify customer participation as a component of co-creation that captures participation in the development of the core offering itself. According to Plé et al. (2010, p. 234) the main dimensions of customer participation can be classified as four important characteristics. These dimensions comprise the nature of the production in which the customer participates, the moment the participation takes place, with whom the customer interacts and what inputs the customer brings into the process (Plé et al., 2010, p. 234). In the CIBM, customers can influence a firm's value proposition, which in turn can lead to acquiring new resources, collaborating with new partners, greater revenue streams and a reduces cost structure for the firm (p. 246).

### **3. Methodology**

#### *3.1 Research design*

Since this research project is aimed at investigating an underexplored research area, a multiple-case study was conducted. According to Yin (2003) and Eisenhardt (1989), case studies are described to be generally useful for theory development. However, the advantage of multi-comparative case studies over single-case studies is that multiple-case studies can observe causal paths and compare different patterns in contrasting circumstances, whereas a

single-case study is limited to circumstance only and can be too context specific (Eisenhardt and Graebner, 2007, p. 26). According to Edmonson and McManus (2007), theory-building research using a single or multiple case studies can be used to answer research questions that address ‘how’ and ‘why’ in unexplored research areas. However, case studies are less suitable to address research questions like ‘how often’ and ‘how many’ (Edmonson & McManus, 2007), because multiple-case studies are not suitable for large-scale hypothesis testing due to their less precise character (Eisenhardt & Graebner, 2007, p. 26). A multiple-case study is particularly useful for this research project, because this project aims to discover patterns of how market engagement influences business model dynamics.

The companies that participated in this research consisted of six relatively young high-tech software startups and three established software SME’s operated in the ICT sector. This is a relatively large sample for a multiple-case study. More cases could increase research complexity and fewer cases could reduce the generalizability of the research results.

Although all the interviewed companies operated in the ICT sector, they nearly all served different market segments. The interviewed companies were specialized for instance in providing football clubs with software to improve their transfers, electronic procurement for procurement organizations, facility management apps for hotels, customer intelligence for retailers, location-based advertising for retailers, hiking & cycling apps for hiking enthusiasts, indoor navigation for hospitals and office buildings and driver intelligence systems for taxi drivers.

Concerning the size of the interviewed companies, there were noticeable differences, ranging from two FTEs to thirty FTEs. Five of the ten interviewed startups employed two or three FTEs, two startups employed around eight FTEs, one SME employed ten FTEs and one SME employed around thirty FTEs. The difference in company size in the dataset enables this study to compare startups and established SME’s with each other in terms of how these firms engage the market and adapt their business model.

In addition, not all interviewed companies were in a similar phase with regards to product development and market introduction. In general, most of the interviewed companies were past the research and development phase and the market introduction phase. However, some companies already started scaling up their business model, whereas other companies had just recently introduced their product on the market. One startup didn’t have a product on the market yet, but 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, since the dataset consists of firms in different phases.

While the interest of this study is to analyze business model dynamics and market interaction, the companies that participate in this research have not been pre-selected on the basis of the occurrence of business model change in these companies or the methods these companies use to engage the market. However, the companies have been pre-selected on the basis of firm size to have a mixed dataset of startups and established SMEs. This kind of sampling is called non-probability sampling in which the units to be observed are selected on the basis of the researcher’s judgment about which ones will be the most useful or representative (Babbie, 2010, p. 193). Four of the six startups were selected on the basis of their success and publicity in entrepreneurship magazines.

The selected companies all showed different types and degrees of business model change, making it an ideal sample for analyzing how market interaction and firm responsiveness could have potentially led to different degrees of business model change.

The names of the interviewed companies have been replaced by different names in this research in order to avoid the publication of sensitive information. An overview of company profiles can be found in table 1.

<b>Name</b>	<b>FTE</b>	<b>Company profiles</b>
Marker	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.
River	2	River is a startup that 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.
Sporter	3	Sporter is a startup that converges scientific models to intuitive tools in sports. Our first product is the WSSA-model, which helps scouts with the selection of new players.
Cooler	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.
ITech	10	ITech is an established SME that provides its customers with motion tracking and vibration monitoring tools.
Motile	3	Motile is a startup that provides hotels with standard software-as-a service facility management apps to increase their quality of service and revenue.
Alife	8	Alife is an established firm that has developed an application that provides routes for hiking and cycling enthusiasts.
E-Proc	11	E-Proc is an established firm that specializes in developing and selling e-procurement software to a broad range of actors in the value chain.
Smarts	7	Smarts is a firm that is oriented on dynamic and personal way finding within buildings and surrounding environments.

*Table 1: Company profiles*

### 3.2 Data collection

Information in this study has been gathered through interviews and secondary resources. The primary source of data in this dataset was obtained by carrying out semi-structured interviews with key informants. These key informants were mainly CEOs or business developers. Furthermore, the official website of the interviewed companies and news articles about the firms have been used as a means of preparing and tailoring interview questions and to gain additional information about the interviewed firms. Nine interviews have been held and the conducted interviews lasted for sixty minutes on average. In addition, field notes and informal records have been made during the interviews to capture potential data of interest for further analysis. During the semi-structured interviews, the respondents were asked open-ended questions 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 in which probes were used to extract rich data from the respondents. The interview began with questions about how the product and target market of the companies evolved over time. In the second section, questions about firm openness with regards to business model experimentation were asked. The third section was dedicated to exploring how the interviewed firms engaged the market in developing their business model. The final part of the interview consisted of questions about firm openness with regards to scaling up the business and the future vision of key informants. While the interview sections have remained the same during the data collection process, the probes used in the interview guide have been revised over time as a reaction to the richness and relativeness of information that the probes generated.

### 3.3 Data analysis

The collected data has been analyzed by building up individual cases for each interviewed company. After this process, the individual cases have been compared with each other in order to build a conceptual framework (Eisenhardt, 1989). The interviews have been transcribed and translated after which the data has been grouped according to responses to the same category of probes and interview questions. The interview data has been analyzed by employing the coding techniques and grounded-theory method proposed by Strauss et al.

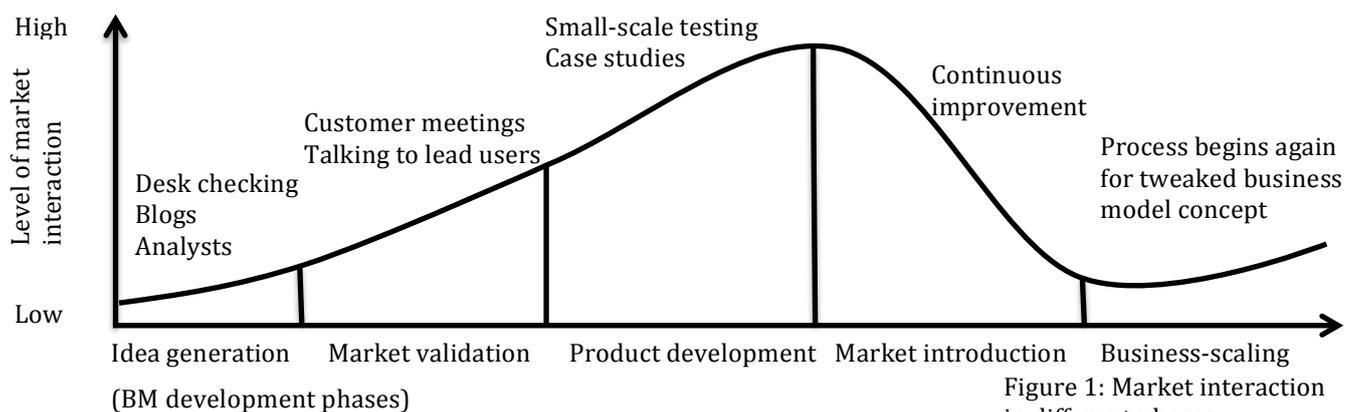
(1998). This process started with open coding which led to the initial identification of concepts, properties and dimensions. Underdeveloped codes that could not be found in most case sites have been left behind in order to focus on the prominent codes that would allow for better comparison between cases. The individual cases have been constructed through constant revising of codes and concepts as the cases began to show important similarities and differences. Furthermore, axial coding has been used to relate categories to their subcategories and to gain more insight in how properties and dimensions of the concepts are linked to each other. The concept of market interaction has been explored by searching the interview data for different extents of market interaction and what activities the interviewed companies used to interact with the market. In addition, axial coding has been used to define the properties and dimensions of the concepts firm responsiveness and BM impact by analyzing interview data with regards to how firms react to market information and how this reaction impacts changes in the business models of the interviewed firms. Selective coding has been used to identify central themes within the research. Each case has been summarized and the results have been grouped into three central themes: market interaction, firm responsiveness and business model impact. Furthermore, techniques like theoretical memoing and concept mapping have been used (Babbie, p. 405).

The cases have been compared with each other using the cross-case method proposed by Yin (1981) and Eisenhardt (1989), where similar categories and their dimensions have been selected within case and compared with other cases to search for intergroup differences. In this process, tables and graphs were created to discover and compare common phenomena between cases with regards to the properties and dimensions of the identified concepts.

## 4. Results

### 4.1 Interacting with the market

Using the identified concepts, indicators and dimensions in this research, it is possible to combine the concepts of market orientation and customer involvement into one variable, called market interaction. What emerged from the interview data was the finding that firms interact with the market to different extents depending on the business model development phase the firm is in at the time the interaction takes place. Interaction with the market has to do with the level of information exchange between the firms and their customers or broader market. Firms use different methods to generate market intelligence depending on the level of market interaction, which all vary in terms of the degree of information exchange between firms and their market. A low level of market interaction is generally concerned with one-sided input of market information without exchanging information with the source of the information provider, whereas a high level of market interaction is concerned with generating market intelligence through the simultaneous input and exchange of information between the firm and their customers or competitors. To explain this further, we will illustrate what level of market interaction was used in different business model development phases and what type of information was obtained from different types of intelligence generation methods.



In the idea generation phase, startups and SMEs discuss potential ideas for a new product, target market or business model internally by engaging in internal discussions with employees. In this phase, firms use a low level of market interaction, since there isn't a clear target market or a focused product to discuss with customers. Low market interaction is characterized by intelligence generation techniques such as desk checking, trend monitoring, reading publicly available research papers or blogs and the opinions of analysts and experts on social media. These techniques are mainly useful for determining the viability of a market in terms of its market size, competitor activity, spotting industry trends and other macro-economical market conditions. Typically, the intelligence generation techniques mentioned above consist of one-sided information inputs, because the firm is not exchanging information with the data providers. The interview data shows that River, Motile, Sporter and Smarts have all engaged in the aforementioned activities in the idea generation phase in table 1. However, Sporter in particular has also used analyst information to fine-tune product information in the product development phase, but this was not the case for the other firms. Smart's CEO mentioned in what activities the company engaged in the idea generation phase:

*'We have been looking what the cases were which you want to use our product for. Our market research showed that the most ideal market was the hotel market. – Smarts' CEO*

After this process, startups and SMEs enter the market validation phase where firms try to validate their initial business model by determining interest from potential customers. In the market validation phase, startups and SMEs use a medium level of market interaction. Medium market interaction can be characterized by arranging meetings and discussions with customers or visiting product fairs to showcase the firm's product. This level of market engagement is particularly useful to exchange product ideas with customers so that firms can determine the most essential product features in the product according to customer feedback. Furthermore, firms can gain more detailed insight in customer behavior and observe the core value of customers. By talking to customers, firms can also get feedback on their revenue model in terms of its appropriateness. In practice, Marker, River, Sporter, Motile and Cooler have engaged the market by customer meetings and discussions in the market validation phase. However, the interview data shows that Smarts have used formal market research to validate the market in this phase. This suggests the line between the uses of intelligence generation techniques might not be as clear as depicted in figure 1. Marker's CEO illustrates the process of validating the market: *'We've tried to determine if retailers were interested in our product. The retailers told us that they would be interested if could meet their demands. In the beginning, we did not have a concrete business model, because our customer segment was not concrete.'* – Marker CEO

After the market validation phase, startups enter the product development phase, where companies further develop the product that has probably been revised through customer discussions. In the product development phase, startups tend to use a high market interaction to further tweak their offering or pricing model. High market interaction consists of small-scale product testing, pilot programs and customer case studies. By using these intelligence generation techniques, firms can generate customer feedback on product details, which is particularly useful to improve the firms existing product or prototype. Furthermore, firms can obtain detailed feedback on their revenue model by determining a price and charging method, using an extensive case study experimentation to determine the return on investment of the revenue model for potential customers. The firms River and Alife have used small-scale product testing to fine-tune product details. River also uses a case-study approach to determine the details of how customers should be charged. Interestingly enough, Smarts was approached by a customer at the end of the product development phase giving the firm essential customer feedback, which led the firm to reconsider its user interface. This finding suggests the notion that there is not always a clear line in terms of how firms engage the market in different phases. River's CEO mentioned the following with regards to product iteration: *'We are developing features constantly and we're fine-tuning and adjusting what the product does. We know that there is a market there with a specific need. It's just about tailoring the system that we have to that. This is a very iterative approach.'* – River CEO

After the product development phase companies move into the market introduction phase and launch the product they have been iterating on the market. In this phase, startups tend to lower their market interaction towards intelligence generation techniques with low information exchange, because the product has already been tweaked and readied for market introduction, which reduces the necessity to alter the product offering, unless firms choose to continuously improve their product even after the market introduction phase. This was the case for both Sporter and Cooler. These firms continued to improve their product after the market introduction phase though small-scale testing, blind tests and focus groups. Also, Alife monitored customer wants by examining app store reviews of their customers. Sporters' CEO mentioned how they keep improving their software:

*‘Clubs feel privileged to be the first one to receive and test a product update. They provide us with feedback to improve small details concerning the new software. We create our own testing market.’ – Sporters’ CEO*

After the market introduction phase, companies move into the business-scaling phase and explore how they can grow their business even further. Startups that want to scale their business begin with new ideas for their business model begin by internally discussing what the next steps should be to take, validate these ideas again in the market and finally implement the new business model. Although these firms are past the market introduction phase, they begin at the start of the idea generation phase and follow up through the market validation and product development phase for their new business model ideas. This was the case for E-Proc and Cooler. These firms mentioned explicitly that they wanted to grow and expand their current business. Both firms have started scaling up their business with internal talks and discussions with employees about new product ideas or business models. After this process, the newly formed or tweaked product or business model had to be validated in the market again and the firms have done this through customer meetings and discussions, focus groups and blind tests where the benefit of the new product/revenue model was explained to customers. After the market was validated again, E-Proc moved into small-scale testing of the new product and revenue model with potential customers. The interview data shows that established SMEs also have to validate their tweaked product or business model in the market even if they already have a product on the market. Table 1 summarizes the findings. E-Proc’s CEO mentioned the following about validating the market and small-scale testing:

*‘From the reactions we’ve got at meetings with our customers and the offers we have made to them, we’ve got the idea that our new model is going to work. We want to proof a concept and see if we encounter any problems along the way. We have a couple of pilot customers’  
– E-Proc CEO*

<b>BM Phase</b>	<b>Firms</b>	<b>Market interaction</b>
Idea generation	River, Motile Sporter Smarts	River’s CEO used desk-checking and research data to quantify the market size and number of competitors in the market. Motile’s CEO mentioned that before expanding into a new market, he searches 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.
Market validation	Marker Sporter Cooler Motile River	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.
Product development	River Alife Smarts	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.
Market introduction	Cooler ITech Sporter Alife	Sporter used small-scale testing of software updates. 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.
Business-scaling	ITech E-Proc Cooler	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.

Table 2: Summary of market interaction methods

#### 4.2 Firms responsiveness

The interview data also showed that firms might react in different ways towards new market information. Firm reaction to new market information can be identified by observing how often firms change elements of their business model according to the information exchange they have with the market resulting from the previously explained concept of market interaction. Furthermore, firm responsiveness to market intelligence is not only determined by observing how often firms have made changes in their business model, but also in what activities these companies engage in to experiment with their business model.

Firms that are responsive to information exchange resulting from market interaction typically engage in three activities. First of all these companies target initial market segments to determine if these segments are viable, which can be done by talking to customers and desk-checking for things like market size and legal barriers. If companies notice that there is a specific demand for their offering, they make the decision to pursue that customer demand, instead of trying to validate their offering further for an extensive period of time. Second, these companies tend to focus their product by product iteration and prototyping according to customer feedback gained from targeting initial market segments. Finally, these firms test the willingness of customers to pay for their product in terms of price, but also in terms of the used revenue model, like monthly subscription fees, fixed fees or activity-based online charging methods. Furthermore, what these companies have in common is that they are open to take risks in terms of moving from the market validation phase into the product development phase. To explain this further, we will illustrate which company profiles can be identified as a result of their level of responsiveness towards market interaction in figure 2.

We will also explain, how firms responsiveness to market interaction might change or develop over time when firms enter new phases in developing their business model.

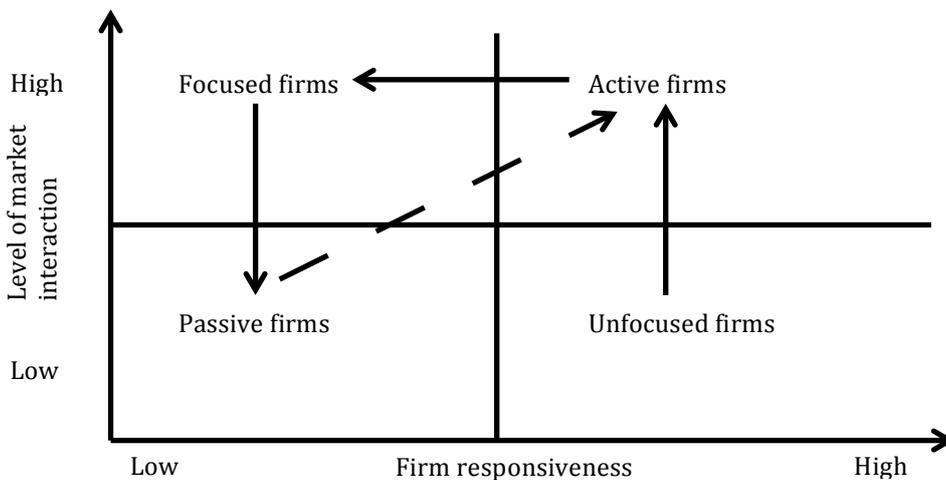


Fig 2: Typology of firm reaction

The figure above shows how firms can be classified according to the level of market interaction they use and their firm responsiveness. Firm responsiveness varies from low responsiveness to high responsiveness. Firms that aren't responsive make little changes in the building blocks of their business model, whereas firms with high responsiveness constantly change different elements of their business model. The concept of market interaction has been explained before and is concerned with the level of information exchange between the firm and its market. The concepts of firm responsiveness and market interaction can be observed together to determine how firms respond to information gained from interacting with the market. Firm responsiveness to market interaction results in four types of firms, which can be classified as passive, active, unfocused and focused firms.

**Passive firms** are characterized as firms that engage in a low to normal level of market interaction by relying on intelligence generating mechanisms such as desk checking, reading publications and monitoring trends. However, these firms typically don't react to the information generated from these methods, which suggests the thought that these firms may generate market information just to check on market conditions as a defense mechanism and only react to the information if it's absolutely necessary. Examples from the interview data suggest ITech, Smarts and E-Proc as passive firms in the idea generation and business-scaling phase. ITech had conducted a small-scale market research, but the reaction of the firm to this new information was not clear. In addition, E-Proc conducted a small-scale formal market research, but the CEO mentioned that the firm did not show any reacted to the new information. Furthermore, Smarts conducted formal market research and the data suggested that the firm should target the hotel market. The firms did not follow through on this data, but 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 the idea.

**Active firms** are characterized as firms that engage in a normal to high level of market interaction by relying on intelligence generating mechanisms such as customer meetings, small-scale product testing and using customer case studies. These firms react on the information they obtain from these intelligence generation methods, which suggests that these firms change their business model or continuously tweak and fine-tune their product. Examples from the interview data suggest that in River, Sporter, Marker, Cooler and E-Proc can be classified as active firms in the market validation, product development and business-scaling phase. 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 a couple of times according to customer feedback. Sporter responded on the idea of a lead user and postponed their initial idea and worked on the product idea proposed by the lead user. Marker engaged in multiple customer discussions to validate customer interest from retailers and acted on the information by targeting the retail market with a different product.

**Unfocused firms** are characterized as firms that engage in a low level of market interaction and are also characterized by a high level of firm responsiveness. This means that these firms actually react to information gained from desk checking and formal market research. These firms mainly react to this kind of broader market information to determine the viability of the market before moving into it and bringing focus to their idea. However, constantly reacting to information generated from desk checking may not be always be a wise idea, since it can lead to many new untested business models. Firms that don't test their business model in the market through customer meetings remain unfocused, 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 on information generated by desk checking to move away from their initial target market into another market that was less crowded by competitors. This event occurred in the idea generation phase. However, this firm didn't dwell too long in the idea generation phase and moved into the market validation phase.

**Focused firms** are characterized as firms that engage in a high level of market interaction by using small-scale product testing, but don't react to the information obtained from this activity if it is not absolutely necessary. The reasons for this might be that the firm is currently executing a well-established product idea and has no room for new features. This could lead to very small changes in a firm's business model building block if it's necessary. An example from the interview data for focused firms can be given from the firm Smarts. Smarts was in the product development phase and nearing the market introduction phase when the firm heard from a lead user that the user interface was not appropriate for the users. 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.

The interview data also suggested that companies might be classified differently in terms of their market interaction and firm responsiveness according to business model development phase the companies are in.

In the idea generation phase, firms are generally unfocused, because firms haven't decided which business idea to pursue and how to fine-tune the business model. It is obviously very easy for firms to change their business idea frequently, because firms haven't made a commitment yet to pursue one specific idea or business model.

In the market validation and product development phase firms become active, because they engage in customer discussions and small-scale product testing to focus on a specific market and fine-tune their product or revenue model.

In the market introduction phase, firms become more focused and only change their product when it's absolutely necessary. In this phase, firms can implement feedback from testing software updates with existing clients. After the market introduction phase, firms can become passive if they decide to stick with their current situation in the market, instead of moving into the business-scaling phase.

In the business-scaling phase, firms need to become active again by testing new or tweaked business models with customers and overcome barriers that might exist for experimentation caused by the established business model or else firms can risk to fall behind the market or not expand at a desired rate. E-Proc, which is an established firm, has demonstrated how to phase out the old business model and become active by validating a new business model.

#### *4.3 Impact of firm responsiveness on the business model*

The earlier explained firm typology has also some consequences for the business model of the firm. Firm responsiveness is concerned with the decision to react or not to react on new market information. The interview data shows that firm reaction to market interaction might also vary in terms of the impact the reaction has on the wider business model. This means that business models might change to a different extent according to what level of market interaction the reaction is based on. One of the main aims of this research was to explore to what degree reacting to market information actually led to changes in a firm's business model. A possible distinction for business model impact can be if the entire business model changes as a result of firm responsiveness or that the change in the business model pertains to only one business model building block, like the value proposition. To explain this further, we will illustrate how firm responsiveness to market interaction can have different consequences for the business model.

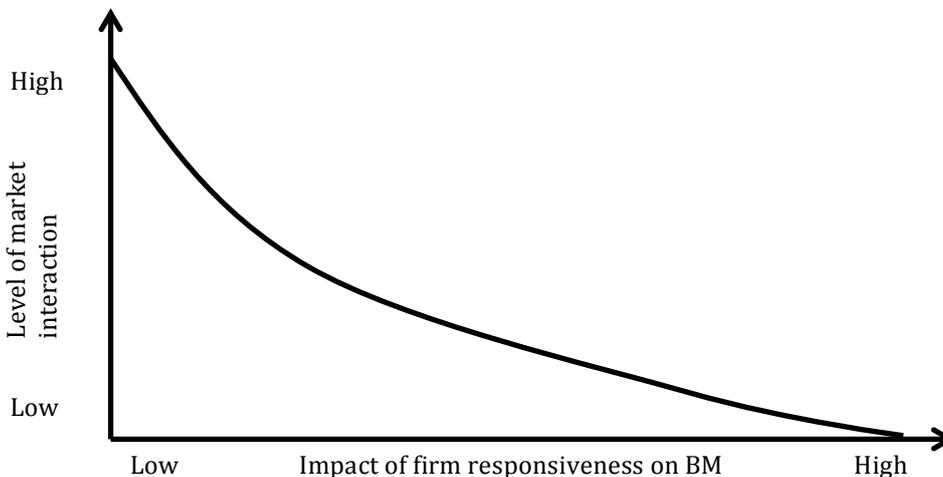


Fig 3: BM impact of firm responsiveness.

The interview data suggests that the impact of firm responsiveness on the business model based on market interaction can vary between three levels.

High BM impact is characterized as changes in all four blocks of the business model, including the value proposition, value architecture, value finance and value network. Here, firms interact with the market to determine their entire business model, instead of limiting market interaction to construct one building block. This type of firm can be classified as an unfocused firm that is at the beginning of constructing its business idea or business model. Typically, these firms don't interact with the market on a high level, because they don't have a fixed business model to validate in the market. These firms mainly use desk-checking techniques to see whether it's viable to pursue an opportunity with a new business model. If it turns out that it's not viable to exploit an opportunity with a business model that the firm had in mind in the first place, firms can choose to pursue a different market opportunity with an entirely different business model. Firms can change their business model so drastically in this phase, because they didn't make a commitment to their business model by executing it. The interview data suggests the firm River fitting this profile. River has gone 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.

Medium BM impact is characterized as changes in one or two blocks of the business model driven by reaction to medium market interaction. Medium impact mainly occurs in the market validation phase, because firms try to validate their initial idea of a business model in the market by engaging in customer discussions. The firms Marker, Sporter and Motile have 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. The interview data suggests, that the more activate companies become in interacting with the market, the more detailed information they can get to fine-tune their initial business model. The building blocks that changed the most in the market validation phase were the value proposition and value finance.

Low BM impact is characterized as detailed changes in one building block of the business model. Low BM impact mainly occurs in the product development phase or in the market introduction phase, where firms get feedback through small-scale testing on product details or on specific charging methods that the company is using. The firms River, Cooler and Smarts have tweaked their product features or revenue model in the product development phase. 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 influences changes in the firm's revenue model. The company is 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 has 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. Finally ITech, which is a more established company, made a small change to their value proposition in the business-scaling phase by diversifying their product portfolio by introducing vibration monitoring as a result of customer feedback and information exchange during product fairs.

Business model change in established companies occurred mostly in the business-scaling phase. 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 company IT.

It can be observed from the interview data that the interviewed firms have changed certain business model building blocks, but the impact of the change in business model varied for different firms and in different phases. 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 changed made adjustments to their business model in the market validation phase.

The most distinguishable business model changes in the interviewed startups as the result of market interaction occurred in the value proposition and value finance. Examples of business model change in these companies are 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 ICT 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 have been made valid in terms of financial viability. 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 interaction did not occur as often as changes in terms of value proposition and value finance. In other words, while market interaction 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 building blocks. However, it was observed that mostly established companies have expanded on the number of full time employees over time, whereas startups generally consisted of three to five full time employees until the market introduction phase. Companies, like Marker have changed their value network to be able to provide the new value proposition of retail intelligence. In the figure below, an integrated figure of the results is shown.

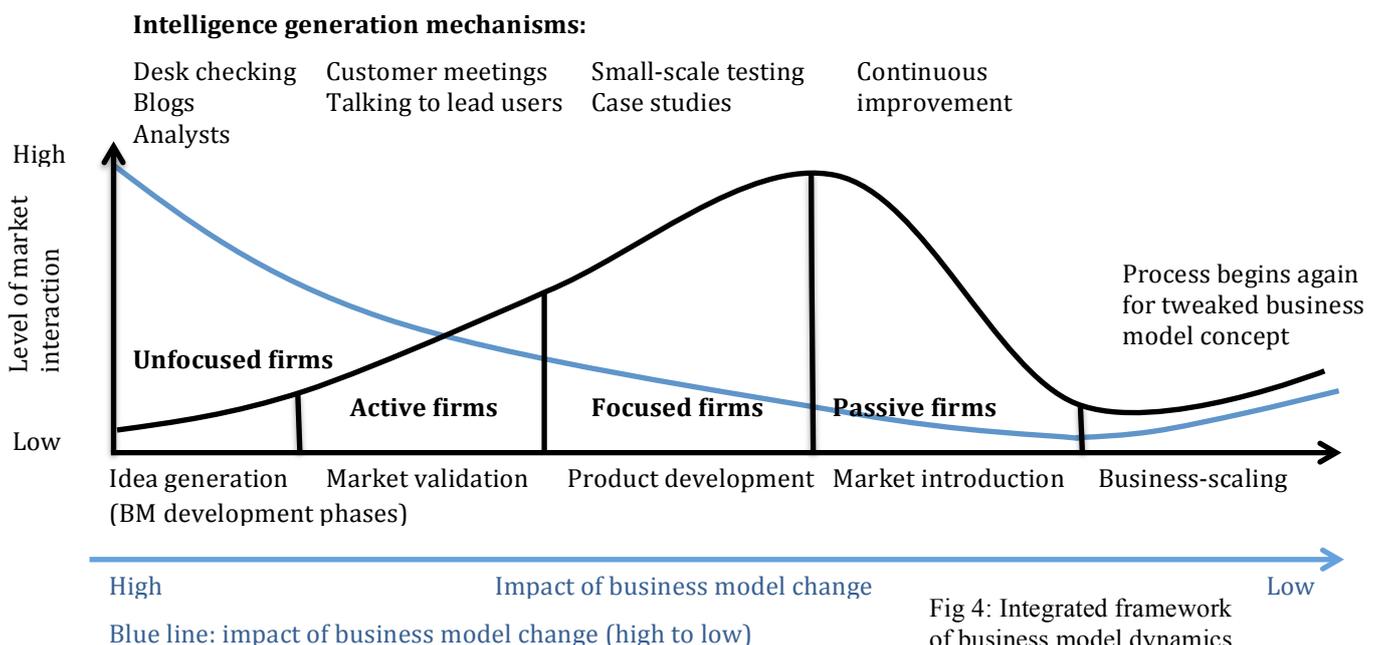


Fig 4: Integrated framework of business model dynamics

## **7. Discussion**

This research ties in closely with the work of Teece (2010), Chesbrough (2010) Al-Debei and Avison (2010), Achtenhagen et al. (2013) with regards to business model dynamics, business model innovation and experimentation. It is also related to the work of Kijl et al. (2005) and Sosna et al. (2010) in terms of identifying the activities firms engage in during different business model development phases. Furthermore, this research shows ties with Narver and Slater (1990) and Jaworski and Kohli's (1990) with regards to generating market intelligence by being market oriented. In terms of customers can be used in co-creating new products, this research shows ties with Lundkvist and Yakhlef (1998), Von Hippel, (2005), Hoyer et al. (2010), O'Hern and Rindfleisch (2009) and Plé et al. (2010).

In terms of business model innovation and experimentation, this research has found some similarities with regards to the work of Teece (2010), Chesbrough (2010) and Achtenhagen et al. (2013). The authors have stressed the importance of matching new technological innovation with the right business model, understanding customer needs and developing their business model based on trial and error learning. The findings of this research also indicate that before launching their product in the market or moving into the product development phase, startups tend to validate their assumptions, engage in conversations with potential customers and adapt their business model by revising their value proposition or revenue model. However, the contribution of this paper is that it provides more insight in how firms react to business model experimentation by showing how responsive firms can be identified, because they typically change building blocks of their business model to a certain extent as a result of market interaction and engage in several activities to experiment with their business model. Also, the contribution of this paper is that different types of firms exist with regards to their openness to business model experimentation in different phases of the business model, namely unfocused, active, focused and passive firms. This finding provides more insight in the process of how firms experiment with their business model in real-life, which has not been investigated sufficiently by Chesbrough (2010), Teece (2010) or Al-Debei and Avison (2010). As an addition to the research of Chesbrough (2010) and Teece (2010), this research found that business model experimentation exists both in established firms and young startups. However, the drivers of business model change showed some differences between established firms and startups. While the motivations of established firms to change the business model was mainly influenced by the state of the economy, industry trends, legal barriers or competitor actions, changes in the business model of startups were more driven by trying to validate the business idea in the market through trial and error learning. Teece (2010) and Achtenhagen et al. (2013) did not highlight these drivers of business model change for both startups and established companies.

Furthermore, the existing concepts of market orientation and customer involvement have been examined in the obtained literature data to determine if the interview data can expand upon these concepts. In the current business literature, the concepts of market orientation and customer involvement are treated as separate constructs. This research combines both of these concepts into the concept of market interaction and lays out how different levels of market interaction can be identified in practice. In addition, the current market orientation scales are mainly aimed at measuring a firm's customer commitment, understanding of customer needs and customer satisfaction measurement activities. Instead of measuring customer satisfaction or customer commitment the interview data shows that firms can achieve a high customer orientation by arranging customer meetings and engaging in discussions to determine product features or brainstorm about a firm's revenue model. This is similar to the findings of Lundkvist and Yakhlef (1998), who mention that firms should embrace a conversational approach towards customer involvement and stimulate the exchange between the firm and its customers during these conversations.

The obtained data from the interviews shows that Narver and Slater's (1990) market orientation lacks a measurement of business responsiveness to the generated market intelligence by firms and that there is a higher level of customer and competitor orientation present, which is mainly characterized by using the obtained customer feedback and competitor information in constructing or adapting a firm's business model building blocks. One of the contributions of this paper is that the findings show how market information can be used in constructing or adapting a firm's business model. This finding suggests how the business model innovation literature and market engagement literature are linked with each other.

Another stream of existing business literature on customer involvement explored how firms use customer feedback on a more detailed level, which may lead to changes in a firm's product features or details (Von Hippel, 2005; Plé et al. 2010). However, most of the existing research on co-creation pertains to customer involvement in the new product development process. In this study, it has been found that firms involve customers in the NPD mostly by exchanging ideas with them, instead of letting customers design parts or core-components of the product. O'Hern and Rindfleisch (2009) classify this level of co-creation as 'submitting'. Furthermore, similar to the findings of Hoyer et al. (2010), this study found that firms engage customers in the early phases of the product development process and use their feedback to reduce the risks of the product being a failure when it launches in the market. According to Kaulio (1998) different customer engagement methods can be used support during different phases of the design process. This research found similar results like Kaulio (1998) with regards to the used customer engagement methods used in different product development phases. Methods like beta testing, lead user engagement, concept testing and consumer idealized design were found in the interview data. Regarding the phases these methods were used in the interviewed firms, it can be stated that concept testing and consumer idealized design were mostly used in the early market validation phase, whereas lead beta testing was mostly used in the later product development phase. Plé et al. (2010) also mention that the intensity of customer participation can vary during different moments of participation, similar to the work of Kaulio (1998) and the observations in this study.

However, the aforementioned authors have analyzed the co-creation process only in term of the new product development process. In this study it has become clear that co-creation and customer involvement does not only pertain to the product development process in terms of product feedback and product improvement, but that customers can be engaged to co-create more viable revenue models in startups or established companies. In this process, most of the interviewed companies have asked the opinions of their customers about the desirability of a the revenue model by exchanging ideas and engaging in concept testing and working on consumer idealized designs, which in turn led to revisions in the value finance of the interviewed firms.

Finally, in existing business model literature, some researcher try to identify dynamic phases, key decision moments and external influences that drive business model change. Kijl et al. (2005) identify three phases in which the business model is subject to change: the research and development phase, implementation phase and market phase. The interview data obtained in this study shows that firms generally walk through five business model design phases. The idea generation, market validation and business-scaling phases, compliment the work of Kijl et al. (2005). However, the identified stages show similarities to the work of Sosna et al. (2010). Idea generation and market validation can be grouped into initial business model design and testing. Furthermore, product development and market introduction can be grouped into the business model development stage.

In short, this research has explored the link between market orientation, customer involvement and business model innovation and tried to fill in the gap in existing literature.

The value of this research lies in providing a detailed look at to what extent firms change their business model driven by their interaction with the market in different business model phases.

## **8. Conclusion**

This paper set out to explore how startups and established SMEs engage the market in constructing or adapting their business model. More specifically, the aim was to investigate what methods these firms use to gain market information and if they react based on interacting with the market by actually changing their business model. The rationale behind this aim was that market information about customers and competitors could only lead to business model change if firms were prepared to react to this kind of information.

Existing business model literature has mainly investigated the components and dynamics between business model components (Osterwalder, 2005, Al-Debei and Avison, 2010), but this research has explored how the dynamics between these components are influenced through firm responsiveness towards market interaction in different phases of business model development.

The results of this research show that firms generate information about the market in different ways. Firms interact with the market in different levels from desk checking and using publicly available information, to engaging in conversations with customers in customer meetings, to small-scale product testing in order to fine-tune product details. The type of information obtained from these different levels of market interaction differ in nature for every level of market engagement. Information generated from desk checking and public research papers is mainly concerned with data about market size, market trends, competitor activity in the market and the economic viability of pursuing a certain niche. Information obtained from customer meetings and discussions is related to exchanging product ideas by obtaining feedback on what product features are essential and discussing what charging methods are appropriate to potential customers. Information obtained from small-scale product testing is concerned with feedback on the details of the product or revenue model.

The value of this research in terms of the newly emerged market interaction concept can be described as a possible integration between the market orientation (Narver and Slater, 1990; Jaworski and Kohli's 1990) literature and the co-creation literature (Von Hippel, 2005; Hoyer et al., 2010; O'Hern and Rindfleisch, 2009). Also, this research has shown that co-creation does not only pertain to customer input in new product development processes, but can also be extended to co-developing revenue models, which expands upon existing co-creation literature. The level of market interaction also differs with regards to different business model development phases. It has been observed that startups typically start with desk checking in the idea generation phase; follow up with customer meetings in the market validation phase and implement small-scale product testing during or after the product development phase. Another valuable finding of this research is the concept of firm responsiveness towards market interaction, which allows us to categorize firms in terms of their responsiveness towards data resulting from market interaction. The four identified firm types are unfocused firms, active firms, focused firms or passive firms. Firms can be characterized differently according to the phase they are. Generally, it is observed that firms go from being unfocused to active to focused and eventually become passive over the course of time. In addition, responsive firms engage in specific activities to experiment with their business model, like trial and error learning, risk taking, targeting initial markets, focusing the product and testing the willingness of customers to pay for their product. The motivation for startups to experiment with their business model is driven by the need to proving the concept in the market. Established firms generally experiment with their business model as a reaction to unhealthy market conditions, economic viability of their current business model or legal barriers.

Another new concept that was identified in this research was the impact of firm responsiveness on the business model, varying from changes in all four of the business model building blocks, to one or two building blocks and details in one building block. According to the type of information firms obtain from interacting with the market, they can respond by changing their business model in different ways. However, only a few firms have changed their entire business model as a result of market interaction. Reacting to information about market, size, economic market viability or competitor activity generally leads to drastic changes in the value proposition and value finance of the firms, whereas reacting to customer feedback on product features and small-scale testing results in filling in the details of the value proposition and value finance. In this research, it was found that the business model elements that change as a result of market interaction are mostly the value proposition and value finance of the firm. Other business model building blocks, like the value architecture and value network, might also change as a result of the new value proposition or value finance, since these elements are interdependent upon each other, but these elements did not always change as a direct result of market interaction.

The newly identified concepts of market interaction, firm responsiveness and business model impact are important for established the link between market orientation, customer involvement and business model innovation, which is an underexplored area in the current business model literature. However, since this research was aimed towards exploring the aforementioned concepts in real life by conducting a multi-case study, it does not claim any statistical significance for the stated conclusions in this research. Thus, more quantitative research is needed to statistically support the conclusions of this research.

## **9. Limitations and future research**

This research focused on establishing the link between the market orientation, customer involvement and business model innovation literature by zooming in to the process of business model change caused by market interaction in different phases of the business model development process. The results of this research are limited in the sense that they don't allow for making larger generalizations about how firms interact with the market and respond to market information, due to the small research sample of nine firms and the explorative nature of this qualitative multi-case study. Also, the sample of in this research consisted mainly of startups and SMEs, which make the results difficult to generalize for firms with more than fifty full time employees.

Furthermore, the interviews conducted in this research were performed on one level only, primarily with the CEO of the startup or SME as key informant. While this approach might be suitable for smaller organizations, it limits this research to only the judgment and opinions of the CEO's, instead of multiple employees in the interviewed firms. Also, the primary source of data for this research were semi-structured interviews, which means that data triangulation is limited in this research, because this study lacks significant data generated from additional data collection methods.

Multi-case studies are primarily useful for theory development and in-depth studies of phenomena, but the conclusions reached in this research need further validation. While this research provides us with a process view of business model change, the constructs identified in this research, like market interaction, firm responsiveness and business model impact and their indicators need to be validated through quantitative studies. In specific, the different levels of market interaction and their indicators, like desk checking, customers discussions and small-scale testing need to be validated quantitatively. This is also the case for the construct of firm responsiveness and the indicators to measure different levels of firm responsiveness, like the activities firms engage in to experiment with their business model and if they indeed make a change in their business model or not.

The same holds up for the concept of business model impact, where different levels of business model impact have to be validated by observing to what extent firms change their business model. Furthermore, future research should investigate the relationship between market interaction and firm responsiveness to determine how firms respond to the level market interaction they use. In addition, the relationship between responsiveness to market interaction and business model impact has to be determined to gain more insight in how responding to market information generation from interacting with the market may lead to different degrees of business model change.

### **10. Implications for practice**

Practitioners like CEOs or business development managers of startups and SMEs can use the findings of this research to think about how their business model is subject to change over time. In addition, practitioners can think about how they can interact with the market in different phases and what impact this interaction can have on constructing or adapting their business model. This research suggests that practitioners should use desk-checking techniques in the idea generation phase to determine viable markets and construct an initial business model. Firms can change their initial business model drastically, because they did not commit to it yet in this phase. Next, firms should validate their initial business model in the market by engaging customer discussions where they can receive feedback on their value proposition and value finance and possibly change these elements according to the feedback. After this process, firms move into the product development phase where small-scale testing is used to fine-tune details in the one or two business model building blocks.

This research has also implications for established SMEs, suggesting that established firms can also experiment with their business model, but go through similar phases as startups for the new or adapted business model. This indicates that although established SMEs have an existing business model that may already be validated in the market, the new or adapted business model also requires validation in the market by talking to customers and small scale testing, because the effectiveness of the new business model has not yet been proven.

## 11. Literature

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