

Technological Change and the Interplay of Strategic Innovation and Business Model Innovation

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Abstract: Technology-enabled innovation has increasingly puzzled and attracted strategists, since it offers opportunities to create new sources of value by challenging traditional approaches. To address this topic, research efforts have focused on the emerging construct of Business Model (BM), that describes how an enterprise creates and delivers value to customers, enticing them to pay and converting payments into profits. However, the relationship between Business Model Innovation (BMI) and Strategic Innovation (SI) is still unclear. This study investigates this relationship by examining the role of technological change in it. To this end, we propose a conceptual framework that classifies technological change according to three dimensions: trajectory, intent, and effect. Second, based on this framework, we conduct a multiple-case study with 16 companies to identify different innovation paths that arise from the interplay between SI, BMI, and technological change. Our findings reveal eight types of innovation paths that depend on the mediating or triggering role of the technological change faced. This result suggests a transitivity in the BM-Strategy and BMI-SI relationships. Change is the essence of BMI and SI, both their origin and outcome, and acts as the fil rouge that connects SI with its execution through BMI. Additionally, we shed light on the role of different actors (top, middle and low management and key employees) in SI and BMI, depending on their level of technological change empowerment. The study shows that BMI can survive without supervision and strategic commitment from top management, being primarily led by line managers and employees invested in experimentation at an operational level. This claim reveals the need to focus on the “technological change empowerment” given to line management and employees, balancing it with an ability to supervise and consolidate BMI. Overall, this study contributes to a better understanding of the relationship between SI and BMI and the role of technological change in it. Our findings provide insights for firms to strategically operate and govern technological change and leverage it to innovate their business models.

Keywords: Business Model, Business Model Innovation, Strategic Innovation, Technological Change, Lean Startup

1. Introduction

The quest for technology-enabled innovation has been influencing and permeating the very foundations of theory, research and practice in strategy (Hamel, 1998). As environmental complexity grows and become increasingly multifaceted, the role of technological change has alternatively puzzled and attracted strategists. While some scholars investigated the effects of volatility on industry structure and dynamics (Porter, 2001; Van Der Zande, 2001), others focused on internalizing the necessary resilience (Hamel and Valikangas, 2004), dynamic capabilities (Teece et al., 1997) and absorptive capacity (Cohen and Levithal, 1990) to accept and adapt to volatility, while still others aimed at stimulating and driving change to capture value as innovators or first movers (Christensen, 1997a; Christensen and Raynor, 2003; Kim and Mauborgne, 2005). In response to this urging issue, academics and practitioners lately seem unanimous in claiming that more research efforts should be directed towards an emerging field, to some extent transversal to the abovementioned approaches, that comprises both Business Model (BM) design and Business Model Innovation (BMI) (Schneider and Spieth, 2013). BMI research arose quite abruptly from the relatively fuzzy BM literature (Zott et al., 2011), and such unstructured rise led to two main issues. First, BMI inherited the relatively scarce theoretical foundation characterizing the body of knowledge on BM, together with the “original sin” of a still unstructured relationship with strategy. In fact, as shown by Schneider and Spieth (2013), BMI research is still concentrated mostly on the identification of prerequisites for and impacts of BMI and its constituting processes and dynamics, but a comprehensive theoretical background is still largely lacking. Second, BMI research has not yet been related to a prolific body of research that dealt with similar subjects of innovation and change in the last decades: that of Strategic Innovation (SI) (Markides, 1997; Tushman and Anderson, 1997; Govindarajan and Gupta, 2001; Govindarajan, 2005). It can be argued that BMI and SI are inherently related, and that this relationship is fundamentally influenced by the nature of change affecting the firm’s strategy (e.g. see Chesbrough, 2010; Teece, 2010). However, a comprehensive understanding of how different characteristics of change impact SI and BMI is still lacking (Markides, 2006). To fill the existing gap and push the understanding of BMI forward, this

study hence investigates the role of technological change in the relationship between Strategic Innovation and Business Model Innovation. Firstly, we propose a conceptual framework that classifies the paramount dimensions of technological change. Based on this framework, we employ a multiple-case study approach to investigate 16 companies in order to identify different innovation paths, i.e. different features of the relationship among BMI, SI and technological change. As result, we present eight types of innovation paths that depend on the characteristics of the technological change faced.

2. Strategic Innovation and Business Model Innovation

To understand the relationship between strategic innovation and business model innovation, we need to investigate the relationship between BM and strategy. Initially, the two concepts were closely linked (Porter, 2001), but in recent years the distinction between them has been consolidated. In its essence, a BM describes how an enterprise creates and delivers value to customers, enticing them to pay and converting payments into profits (Teece, 2010). Casadesus-Masanell and Ricart (2010) argue that BM refers to the way the firm operates and creates value, while strategy refers to the choice of the BM to compete. BM, thus, becomes a valuable tool for developing and implementing strategy: a mechanism to both map the business in static conditions and describe the internal strategic context during change (Hacklin and Wallnöfer, 2012). If BM is a tool to develop and implement strategy, it is arguable that SI and business model innovation (BMI) are closely related. Kim and Mauborgne (1997), for instance, praised the benefits of value innovation, a new strategic logic which refers to fundamentally changing the basis of a business' dominant value proposition in order to create and dominate new competitive landscapes. Similarly, Hamel (1998) proclaimed that competitive advantage in the dynamic environment of the 21st century would reside in "changing the rules of the game", that is, performing a non-linear BMI. Both Kim and Mauborgne (1997) and Hamel (1998) were writing in the context of SI (Govindarajan and Gupta, 2001; Charitou and Markides, 2003), a research stream in management theory that aimed at developing firms' capabilities to continuously generate innovations as a competitive response in changing environments. Building on the nature of the relationship between BM and strategy, it can be posited that BMI serves as a means to operationalize SI endeavors. However, not every strategic innovation is the same. Ghezzi et al. (2014), for instance, found evidence that in some cases, BMI can lead to emergent SI rather than the other way around. Thus, it becomes important to investigate the role of technological change in the relationship between SI and BMI.

3. Technological Change

In strategy research, the nature and classification of technological change vary. As Drucker (1969) states, changes can take place in the form of technological environment uncertainties, due to the rise of new technologies (exogeneous "technological discontinuity") that affects the industry structure. However, technological change not only originates in the external environment. Instead, it can also be triggered inside the firm, by emerging phenomena within the internal environment (Ghezzi et al., 2015). Such endogenous discontinuities are often linked to gaps in the "work setting", "tasks" or "relations" (Watson-Manheim et al., 2002). Indeed, technological change within an enterprise can manifest itself as either a prominent or a local modification in processes, practices or routines, or a variation in products (by creating different outputs due to an innovation) (Anderson and Tushman, 1990). Interestingly, such internal phenomena may take place unintentionally, due to the risk component which resides in the planning processes of every enterprise and makes it impossible to achieve perfect forecasting (Schreyögg and Steinmann, 1987). Intent is indeed another key dimension that characterizes technological change and its influence on strategy and BM. The discussion on the explicit or implicit intention to change manifested by a company's top management can be borrowed from the literature on the strategy making process, which contrasts a deliberate approach to strategy making and strategic planning (e.g. see Armstrong, 1982; Lorange, 1980; Chermack et al., 2001) to an emergent (and possibly bottom-up) process made of a set of informal strategic decisions (Mintzberg, 1994; Christensen, 1997b). Considering that BMI is the operationalization of strategy making process (Shafer et al., 2005; Casadesus-Masanell and Ricart, 2010), BMI can therefore be indirectly influenced by technological change factors, which impact or modify the BM constituting building blocks or parameters (e.g. Ghezzi et al., 2015). Therefore, depending on its characteristics, change may have different forms of influence on Strategy Innovation and BMI. The way technological change phenomena manifest varies according to a set of key features and characteristics that we bring back to three dimensions: trajectory; intent; and effect (Table 1).

Table 1: Three classification dimensions of Technological Change.

Dimension	Alternatives	Description
Trajectory (e.g. Miller, 1985; Schreyögg and Steinmann, 1987; Watson-Manheim et al., 2002; Anderson and Tushman, 1990)	Endogenous	Change stems from inbound firm processes or dynamics.
	Exogenous	Change is triggered by outbound phenomena and events which are not directly or fully controllable by the single firm.
Intent (e.g. Lorange, 1980; Armstrong, 1982; Mintzberg, 1994; Christensen, 1997b)	Deliberate	Change is recognized and deliberately accepted by the top management, and strategy is modified accordingly.
	Emerging	Change arises informally and implicitly in a bottom-up, local or unstructured fashion, and is not formally included in the firm's strategy in the first place.
Effect (Drucker, 1969; Miller 1985; Ehrnberg, 1995; Bessant et al., 2005; Ghezzi et al., 2014)	Continuous	Change has a continuous trait and represents an evolution of the firm's existing strategy and related performance.
	Discontinuous	Change has a discontinuous trait and represents a revolution of the firm's existing strategy and related performance.

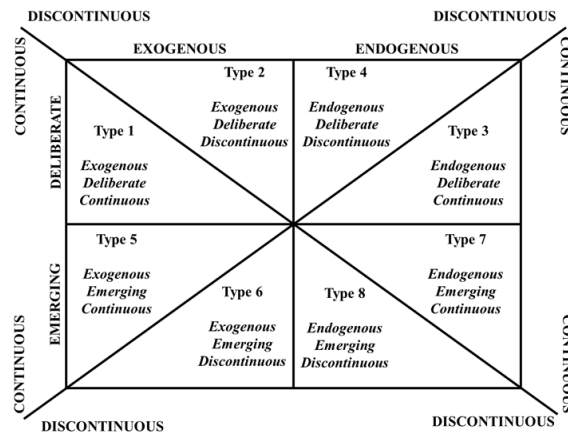


Figure 1: Technological Change Types Matrix

The three classifications dimensions can be presented in different combinations of their alternatives, resulting in a set of configurations. The different possible configurations are presented in the Technological Change Types Matrix (Figure 1), which shows eight “Change Types”. Based on them, one research question (RQ1) rises up: how does the typology of technological change influence the relationship between SI and BMI? We argue that technological change may act as an influencer – either a mediator or a trigger – of the relationship between SI and BMI.

4. Methodology

For this study, we adopted an empirical qualitative multiple-case study research approach, which is helpful for theory building based on in-depth field investigation that seeks to understand how a certain phenomenon occurs. (Yin, 2009; Eisenhardt and Graebner, 2007). The cases were selected by means of theoretical sampling (Eisenhardt and Graebner, 2007), where the companies included in the theoretical sample were drawn from a cross-industry database created by researchers involved in a two-year international research project on firms undergoing technology-enabled BMI. Due to the explorative nature of the topic, the research favoured depth of analysis over width, and a final sample size of 16 companies has been selected. The final sample included two cases for each of the eight configurations. For data collection, we followed Yin (2009), employing a descriptive case study method based on 88 semi-structured interviews and documental analysis with 57 informants during a period of 14 months. The need for assessing SI and BMI processes, nature of technological change and the sequence of relationships linking them led to the adoption of an “embedded” case study (Yin, 2009), with multiple units of analysis, related to: (i) technological change (ii) strategic innovation; and (iii) BMI. The reference framework selected to assess BMI is that proposed by Osterwalder and Pigneur (2010). Such framework is widely

adopted and employed both by practitioners and academics (e.g., see Chesbrough, 2010). For data analysis, we used the Technological Change configurations and the details collected during the interviews about the sequence in which BMI occurs considering the SI process and the need or opportunity of change.

5. Results

Next, we discuss the cases and the observed innovation path that describes the relationship between strategy and BMI when considering the role of each type of technological change.

5.1 Type 1: Exogenous, Deliberate and Continuous Change

In both cases A and B, change had an outside-in thrust, originating from the external environment and influencing firms' strategy and BM. Notwithstanding its external origin, change was deliberately interiorized by top managers, and a SI process was hence triggered to include the features and outcome of change within firms' strategy. In turn, SI was concretized and executed through BMI, and drove a redesign of one or more dimensions in the current BM. In this type, the continuous trait of change determines incremental variations of those BM dimensions affected by innovation.

5.2 Type 2: Exogenous, Deliberate and Discontinuous Change

In both cases C and D, change had an outside-in thrust, originating from the external environment and influencing firms' strategy and BM. Notwithstanding its external origin, change was deliberately interiorized by top managers, and a SI process was triggered to include the features and outcome of change within the firms' strategy. In turn, SI was concretized and executed through BMI, and drove a redesign of several dimensions in the current BM. The discontinuous trait of change determined radical variations of those BM dimensions affected by innovation.

5.3 Type 3: Endogenous, Deliberate and Continuous Change

In these two cases E and F, the rise of internal resources, competencies and know-how was embraced within a deliberate and continuous strategic innovation and BMI represents the execution of such deliberate strategy. Consequently, change was the effect of a deliberate strategic decision made by the top management, who, by means of SI, aimed at modifying the current strategy, BM and performance. Therefore, change determined by SI followed an inside-out trajectory, stemming from inbound processes and dynamics and later reflecting on the firms' BM, and being executed through BMI. The continuous trait of change determined incremental variations of the performance of those BM dimensions affected by innovation.

5.4 Type 4: Endogenous, Deliberate and Discontinuous Change

In both cases G and H, change was the effect of a deliberate strategic decision made by top management, who, by means of SI, aimed at modifying the current strategy, BM and performance. Thus, SI generated change according to an inside-out trajectory, stemming from inbound processes and dynamics and later reflecting on the firms' BM, and being executed through BMI. The discontinuous trait of change determined radical variations of those BM dimensions affected by innovation.

5.5 Type 5: Exogenous, Emerging and Continuous Change

In these cases I and J, change had an outside-in thrust, originating from the external environment and influencing firms' strategy and BM. Change propagates and spreads in the firm in an emerging and unstructured fashion, not immediately reflected in a variation of the overall strategy, but rather being absorbed locally in one or more BM dimensions that represent the strategy's implementation. Emerging variations in the BM characterize a BMI. The continuous trait of change determined incremental variations of those BM dimensions affected by innovation. Following a bottom-up diffusion process, BMI is later caught up by and formalized within the overall strategy through SI.

5.6 Type 6: Exogenous, Emerging and Discontinuous Change

In these two cases K and L, change had an outside-in thrust, originating from the external environment and influencing firms' strategy and BM. Change propagated in the firm in an emerging and unstructured fashion, not immediately reflected in a variation of the overall strategy, but rather being absorbed locally in one or more BM

dimensions that represented the strategy implementation. The emerging variations in the BM caused a subsequent BMI, as the other BM dimensions must be adapted to cope with localized evolutions. The discontinuous trait of change determined radical variations of those BM dimensions affected by innovation. Following a bottom-up diffusion process, BMI was later caught up by and formalized within the overall strategy through SI.

5.7 Type 7: Endogenous, Emerging and Continuous Change

The type of change appearing in cases M and N had the effect of implicit, unstructured or local modification of the firms' current BM. Such change propagated and spread in an emerging and unstructured fashion, not immediately reflected in a variation of the overall strategy, but rather being absorbed locally in one or more BM dimensions. Emerging variations in the BM characterize a BMI. The continuous trait of change determined incremental variations of those localized BM dimensions affected by innovation. Following a bottom-up diffusion process, BMI was later caught up by and formalized within the overall strategy through SI.

5.8 Type 8: Endogenous, Emerging and Discontinuous Change

Change, in cases O and P, was the effect of an implicit, unstructured or local modification of the firms' current BM. Change propagated in an emerging and unstructured fashion, not immediately reflected in a variation of the overall strategy, but rather being absorbed locally in one or more BM dimensions. The emerging variations in the BM cause a subsequent BMI. The discontinuous trait of change determined radical variations of those BM dimensions affected by innovation. Following a bottom-up diffusion process, BMI is later caught up by and formalized within the overall strategy through SI.

6. Discussion and Conclusions

The proposals and findings presented in this study touch upon and relate two key themes in the research stream on BM, strategy and technology: (i) the relationship between SI and BMI and the nature of technological change's influence on it; and (ii) the actors and roles in technology-enabled BMI as a process.

First, this study focuses on clarifying the relationship existing between BMI and SI. The link between BM and technological change was already postulated in several works (Lindgardt et al., 2009; Teece, 2010; Chesbrough 2010; Casadesus-Masanell and Ricart, 2010). Although these studies pointed in the same direction, they showed a largely conceptual approach to the problem, and mostly focused on the dyadic relationships strategy-BM and BM-technological change only. We establish a more formal and systematic relationship between these concepts, thus confirming and extending the conceptual work from Teece (2010). More specifically, we extend the insightful proposals from Casadesus-Masanell and Ricart (2010) and Richardson (2008) to their natural (but still implicit) consequences: as the BM reflects the execution of business strategy, we claim that BMI is hence "Strategic Innovation in action". Indeed, as our cases show, SI choices affect one or more BM parameters, ultimately determining BMI – or conversely, BMI will eventually lead to SI.

In addition to consolidating and extending the BMI-SI relationship, our study makes one key step further, by finding that the nature and characteristics of technological change significantly matters in such relationship. Indeed, positioning the cases in the Technological Change Types Matrix shows that technological change acts as the fil rouge that connects SI with its execution through BMI, either as a mediator or as a trigger. The relationship between SI and BMI depends, in its direction (trajectory), causality (intent) and intensity (effect), on the type of technological change in place.

Our framework which classifies the 16 cases on the basis of eight change types gives rise to eight different "innovation paths" for the relationship between SI, BMI and technological change itself. We find that the classification dimension of change intent plays a fundamental role in shaping the causality of the SI-BMI relationship.

Two different streams of innovation in strategy seem to exist. The first stream (innovation paths 1 to 4) clearly refers to the traditional research stream on the strategy making process (Armstrong, 1982), with the addition that a change in strategy eventually reflects on a change in the BM (Casadesus-Masanell and Ricart, 2010; Johnson et al., 2008). The second stream (innovation paths 5 to 8) contributes to the discussion on "business model lifecycle" (Morris et al., 2005) and "experimentation" (Lindgardt et al. 2009; Chesbrough, 2010), particularly in the context of strategic experimentation (Govindarajan and Trimble, 2005). Thanks to effectuation

(Sarasvathy, 2008) they can create actions based on the initial results of experiments, generating new data which may point towards previously latent opportunity.

The four change types related to an emergent intent highlight the crucial role of managerial leadership for new and emerging BMI resulting from experimenting (Hamel, 1998). Chesbrough (2007) underlines the “business model innovation leadership gap” existing in many organizations: no one in the organization has both the authority and the capability to innovate business models. Thus, top managers could represent a barrier to innovation, as they are focused within the current business model (Chesbrough, 2007). An organization needs to identify internal leaders for business model change and give managers the resources and authority to define and launch business model experiments (Chesbrough, 2010).

Our study contends that it is true that technology-enabled innovation will not take place at a planned formal strategy level without a top-down deliberate approval, though it will survive and live at an operational strategy level, and may drive performance change even before the overarching strategy catches up. To different extents, this is the case for the eight companies who followed innovation paths 5 to 8, where innovation was led by middle/low management and employees with a strong grip on BM’s operational execution, thanks to specific technological skills and know how. This is to some extent consistent with the recent notion of “big bang disruption” and “undisciplined strategy” posited by Downes and Nunes (2013) where technology-enabled innovations may not be led by a strategy and shared by a top manager, since change may not require a budget approval and may be based on experimenting and combining different resources and assets, either internal or external.

Our study shows that BMI may survive the lack of supervision and strategic commitment by the top management, being primarily led by line managers and employees invested in experimentation at operational level. This claim may attenuate the risk of encountering top managers that impair rather than enable BMI; also, it sheds light on the need to focus the attention of practitioners on the “technological change empowerment” or strategic independence they wish to vest the line management and employees with.

Value for practitioners is equally important, since this study provides a set of tools to: (i) categorize technological change; (ii) relate technological change types to SI and BMI, and map the “innovation path” a firm has – explicitly or implicitly – undertaken; and (iii) disclosing the strategic role of technological change empowerment assigned to different actors.

Like all studies attempting to frame reality in a model, this work is not without limitations, deriving from: any observer bias in the activities of case data gathering and analysis; and the possible information loss determined by case selection. Although sound methodologies and the use of a wide cross-industry sample attenuate such limitations, a validation of these findings through quantitative analyses on a larger sample should be the objective of future research. Other opportunities for future research could: relate to the investigation of how firm size can influence the SI-BMI relationship and the chance to actually trigger BMI without a deliberate strategic commitment; assess the opportunities and risks deriving from a distributed strategic independence allowing managers and employees to leverage their technological skills endowment, which could lead to local or contingent approaches possibly diverging from the institutional strategic intent.

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