
Business model innovation from an open systems perspective: structural challenges and managerial solutions

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Abstract: There is an emerging consensus that business models are systemic and transcend firm boundaries. Yet, existing research on Business Model Innovation (BMI) challenges focus almost exclusively on intra-firm factors such as capabilities, cognition and leadership. We explore challenges related to BMI by instead drawing on an open systems perspective on organisations. In particular, we argue that the systemic and boundary-spanning nature of business models imply that firms are forced to act under conditions of interdependence and restricted freedom, since they do not have executive control over their surrounding network. Consequently, we propose that suitable managerial solutions include the development of shared knowledge, appropriability regimes based on trust, network stability and the alignment of heterogeneous interests.

Keywords: business model; innovation; open systems; networks; managerial solutions.

Reference to this paper should be made as follows: Berglund, H. and Sandström, C. (2013) 'Business model innovation from an open systems perspective: structural challenges and managerial solutions', *Int. J. Product Development*, Vol. 18, Nos. 3/4, pp.274–285.

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1 Introduction

During the last decade, interest in business models has boomed among both scholars and practitioners. Since 1995, more than 1000 articles about business models have been published in peer reviewed journals (Zott et al., 2011) and CEOs of many established companies regard Business Model Innovation (BMI) as a key strategic challenge (Ghaziani and Ventresca, 2005; Pohle and Chapman, 2006; Giesen et al., 2007; Zott et al., 2011).

While there are many different definitions of business models, there is an emerging consensus that the concept provides a holistic description of how firms create and appropriate value through interaction with its surrounding environment (Zott et al., 2011). Previous research has also pointed out the importance of BMI, i.e. the renewal of business models for commercial purposes. Renewal of existing business models can provide firms with a competitive advantage in established industries but can also be necessary when launching significantly different products (Björkdahl, 2009).

Firms frequently struggle to innovate their business models (Chesbrough and Rosenbloom, 2002). Existing literature has primarily studied challenges from a firm-internal perspective and has focused issues like resource inertia (Tripsas and Gavetti, 2000; Amit and Zott, 2001), cognitive barriers (Chesbrough and Rosenbloom, 2002), lack of leadership (Doz and Kosonen, 2010) and lack of adequate organisational structures and processes (Santos et al., 2009). This focus on internal matters is somewhat surprising, bearing in mind that many definitions of business models are explicitly concerned with how firms interact with their environment.

To complement existing research, we will explore BMI challenges by drawing on an open systems perspective on organisations (Scott, 2002). We argue that firms engaging in BMI must act under conditions of restricted freedom and within complex interdependent systems. Also, we develop a set of propositions focusing on structural challenges and related managerial solutions.

The paper is organised as follows. In Section 2, we review existing literature on business models and challenges related to BMI. Section 3 gives a description of the open systems perspective on organisations. Based on this, in Sections 4 and 5 we analyse challenges and managerial solutions related to BMI. Finally, in Section 6 we summarise the contributions of this paper and briefly discuss implications for management.

2 Literature on business models

There are several reasons why interest in business models has grown considerably in recent years. Some claim that increasing costs of product development in industries such as pharmaceuticals and biosciences have forced firms to consider alternative ways to make money (Chesbrough, 2007). Others argue that the decreasing costs of product

development, especially in software- and internet-related industries, have spawned a Cambrian explosion of new business models (Ries, 2011). On a more general level, expanding global competition (Dicken, 2003), the development of flexible manufacturing technologies (Sanchez, 1995), and increasing industrial and technological convergence (Amit and Zott, 2001; Kodama, 2009) all speak to the importance of BMI. However, despite this growing interest, there is no generally accepted definition of what constitutes a business model. Therefore, we will start by reviewing some different conceptualisations of business models.

Echoing the emergence of practitioner interest, the late 1990s saw extensive scholarly focus on e-business models (Amit and Zott, 2001) with many early contributions coming from the field of information systems (e.g. Eriksson and Penker, 2000; Currie, 2003; Hedman and Kalling, 2003).¹ Since then, the discourse has broadened substantially, and today business models are frequently discussed by technology and innovation management scholars as a conceptual means for relating a firm's technological and market domains (Chesbrough and Rosenbloom, 2002; Calia et al., 2007; Björkdahl, 2009) and by strategy scholars who use the concept to discuss the creation of sustainable competitive advantage (Christensen, 2001; Teece, 2010). Partly because of this multi-disciplinarity, there is no generally accepted operational definition of business models. However, there is high-level agreement on a number of issues. First, business models describe how firms, or business units, create, deliver and appropriate value (Osterwalder and Pigneur, 2004; Shafer et al., 2005; Zott et al., 2011). Second, it is common to define business models in terms of sets of components and their interrelationships, e.g. customer segment, value proposition, revenue model and key partners (Chesbrough and Rosenbloom, 2002; Osterwalder and Pigneur, 2004; Johnson et al., 2008). Finally, there is an emerging consensus that business models transcend the boundaries of any one firm (Amit and Zott, 2001; Afuah, 2004; Itami and Nishino, 2010; Casadesus-Masanell and Ricart, 2010; Zott et al., 2011). Zott and Amit (2010) explicitly make this point when they define a business model as "*a system of interdependent activities that transcends the focal firm and spans its boundaries*" (p.216). Building on this emerging consensus, we define a business model as: (a) a high-level description of how a firm (or part of a firm) creates, delivers and appropriates value, that is (b) centred on a focal firm, but that also (c) transcends the boundaries of the focal firm. A BMI can thus be thought of as the introduction of a new business model aimed to create commercial value. It should be underlined here that we focus on procedural rather than substantive success. When speaking of successful BMI, we thus mean that an initiated BMI project was successfully completed, i.e. resulted in the implementation of a changed business model (regardless of whether the original BMI vision was altered as a result of the implementation process). We do not speak of substantive success metrics such as profitability and growth.

BMI is perceived as important to many established firms, both for competing in mature industries and in order to appropriate value from new technologies (Björkdahl, 2009). Unfortunately, BMI has also proven very difficult (Chesbrough, 2007; Johnson et al., 2008, Zott and Amit, 2010). To date, efforts to improve the likelihood of BMI success have identified four main issues: resource inertia due to conflicts between the resource configurations underpinning the existing business model and those resource configurations needed to develop and implement new business models (Amit and Zott, 2001; Doz and Kosonen, 2010), cognitive inertia within the focal firm due to the influence of an existing dominant business model logic (Chesbrough and Rosenbloom,

2002), a lack of top management leadership capabilities needed to envision and legitimate BMIs within the focal firm (Doz and Kosonen, 2010; Smith et al., 2010), conflicts between old and new business models (Amit and Zott, 2001) and a lack of firm-internal organisational structures and processes needed to manage dual business models, e.g. for managing an ambidextrous organisation (Santos et al., 2009; Chesbrough, 2010).

While these perspectives provide valuable insights into BMI challenges faced by established firms, focus is almost exclusively on firm-internal issues. Indeed, the inertia created by existing resource configurations and by organisational cognitive frames, the lack of top management leadership, and problems related to organisational design, all locate the key BMI challenges within the focal firm. Moreover, these challenges have been treated previously in the literature on product innovation and technology management. Internal tensions between new and old business models are in many ways similar to when established competencies lose their value under conditions of technological discontinuity (e.g. Tushman and Anderson, 1986) or when core competencies become core rigidities (Leonard-Barton, 1992). Cognitive barriers and lack of leadership are also not specific for BMI, but important to organisational change projects and radical product development initiatives more generally (Lee and Na, 1994). Indeed, most of the literature on BMI challenges is not unique to the topic. The fact that several reviews of the business model literature failed to discuss specifically BMI-related challenges that can be regarded as confirming our observation (e.g. Zott and Amit, 2010).

Given our definition of business models – as centred on a hub firm but transcending its boundaries – we contend that the existing focus on intra-firm issues only tells half the story. Consequently, many important BMI challenges are left unexplored. More specifically, we believe that by approaching this topic from an open systems view of firms – i.e. by focusing on organisations as fundamentally embedded in the environments in which they operate (Scott, 2002) – we should be able to identify additional challenges and potential solutions that are, if not unique to BMI, more salient than they are in traditional intra-firm innovation. Since very little has been written about BMI from an open systems perspective, our ambition is not to provide a comprehensive analysis. Instead, our aim is to introduce this perspective and draw on a number of relevant literatures to provide a series of high-level propositions focusing on structural challenges and managerial solutions to BMI.

3 The open systems perspective on organisations

Open systems theory posits that organisations are influenced by their environment. An open system can be defined as a system that allows interactions between the focal subject or organisation and its surrounding environment (Katz and Kahn, 1966). This perspective stands in contrast to closed systems theories such as scientific management and human relations. Building upon Katz and Kahn's (1966) work on organisations as open systems, Pfeffer and Salancik (1978) argued that previous studies of organisations had paid too little attention to how organisations interact with their environment. In their book *'The external control of organizations: a resource dependence perspective'* (1978), the authors instead addressed how the environment controls an organisation. It was argued that organisations depend on external actors to obtain critical resources in order to survive. An actor can be defined as an individual or a group of individuals (e.g. a firm or a part of a firm) who have a particular objective and have a certain degree of autonomy in relation to

other actors. The open systems perspective assumes that organisations are forced to act under conditions of restricted freedom and that they tend to serve those actors which provide them with resources. Customers, suppliers and owners can be regarded as such actors that exercise significant indirect control over a firm (Christensen, 1997).

While organisations depend upon the environment for critical resources, the environment is considered to be unreliable as it is beyond the organisation's administrative control. Therefore, organisations tend to build relationships with surrounding actors in order to reduce uncertainty (Dubois, 1998). Moreover, the environment is characterised by heterogeneity in terms of incentives. Each actor has its own preferences and criteria for evaluating the actions of an organisation, and hence, any actions undertaken by an organisation are likely to imply negotiations or conflicts. As organisations build relations to other actors, they often become forced to act under conditions of interdependence. Interdependence can be defined as a situation where the outcome of an action depends on two or more actors (Pfeffer and Salancik, 1978). As organisations control different bundles of resources and perform different activities, networks of firms emerge, where no one is in complete control over their own operations. This value network perspective is different from the more traditional depictions of firms found in the dichotomous view of markets and hierarchies (Powell, 1991). While hierarchies are characterised by executive control and markets assume autonomy and arms-length distance between suppliers and customers, a network perspective instead assumes restricted freedom and interdependence between firms.

Though networks of firms are held together by mutual benefit, there is always a mixture of intersecting and conflicting demands in these relationships. However, despite this built-in complexity, networks are generally assumed to be conservative and path dependent since no individual actor has complete executive power over it and since the resources and activities tend to be specialised to create value within the context of the network (Håkansson, 1989). Under high degrees of interconnectedness and specificity, it is often enough that one actor blocks an initiative for it to be stopped completely (Adner, 2008). With a larger amount of concerned actors and higher degrees of heterogeneity, a network constellation is arguably even more difficult to change.

Organisations and their interactions with the environment exhibit features of non-linear systems, where positive and negative feedback loops create outcomes that are unstable and hard to predict. The complexity of a system usually makes it difficult to assess the outcome of a change since the strength of interactions between elements of the system is often unknown. When a feedback loop occurs, each agent can try to alter the rules and institutional settings that govern the interaction. They cannot, however, remove the feedback loop or the consequence of it in terms of other feedback loops. If all agents accept the institutional setting, the system will after a while converge towards equilibrium. If, on the other hand, several agents try to change the rules governing their behaviour, uncertainty will increase significantly and the system will be subject to positive feedback loops which augment certain mechanisms towards an unstable equilibrium (Stacey, 1995). Common norms, maintenance controls and a stable institutional setting will lead an organisation towards stability (Lawrence and Lorsch, 1967). Under these conditions, negative feedback loops will eventually draw an organisation towards equilibrium.

4 Business model innovation from an open systems perspective

The coordination of specialised actors and groups within the firm is a key managerial challenge (Penrose, 1959; Lawrence and Lorsch, 1967) and one that is often critical for firms that engage in new product development and innovation, e.g. the coordination of R&D and marketing departments (Gerwin, 2004). Since BMIs typically span an even wider range of firm functions than traditional product innovation projects, the coordination challenges are even greater. Because so many diverse functions are involved, it is unlikely that any person has either the capacity or informal authority required to manage more BMI projects (cf. Chesbrough, 2007). However, as long as the innovation project only concerns functions internal to the firm, the task of coordinating and managing activities can, in principle, be delegated to a heavyweight manager with formal authority over all involved actors (Clark and Wheelwright, 1992).

The managerial coordination challenge takes on a qualitatively different character when the actors involved are beyond the formal authority of any one manager. And this situation is not uncommon. Loosely coupled networks (Orton and Weick, 1990) are becoming increasingly important loci of innovations (Freeman, 1991), and especially so when the knowledge bases underpinning the innovations are complex, expanding and dispersed (Powell et al., 1996).

As discussed above, business models are not fully controlled by the focal firm. Multiple firms are involved and supply the firm and its business model with the resources needed to survive. Firms that engage in BMI are therefore subject to restricted freedom and are forced to act under conditions of interdependence. Since the involved actors are also characterised by heterogeneity in terms of resources, competencies and incentives, any attempt to reconfigure the firm's business model is likely to result in opposition from one or more actors, who are often able to block the process. As it is sometimes enough that one actor obstructs for an attempt to fail, the overall risk will increase significantly when the number of involved actors increases (Adner, 2008). With a larger amount of actors concerned, the risks of opposition and consequently failure of the BMI tends to increase. Strategies enacted by managers will affect both actors inside the organisation and beyond its boundaries, where there is no executive control. This leads us to the following propositions:

Proposition 1: A high degree of interdependence between the focal firm and the other actors involved will result in lower probability of successful BMI.

Proposition 2: A lower degree of heterogeneity in terms of incentives among the concerned actors will increase the likelihood of successful BMI.

Proposition 3: The more changes a BMI implies for the actors involved, the less likely it will be to succeed.

Since open systems are characterised by feedback loops, BMIs will likely lead to extensive and unpredictable effects both inside the focal firm and throughout the concerned network. There are arguably interdependencies between the different business model components, e.g. value proposition, customer segment and capabilities, which may require several of the components to be changed simultaneously (Mokhlesian and Holmén, 2012). Taken together, the positive and negative feedback loops characterising the system will make the outcome of any BMI initiative quite uncertain. This will likely further reduce the willingness of key actors to undertake necessary changes.

Proposition 4: *The eventual outcome of a BMI will become more unpredictable when more actors are involved.*

5 Managing innovation across firm boundaries

The preceding sections pointed out that the systemic and boundary-spanning nature of business models imply certain challenges related to restricted control, network complexity and uncertainty. Next, we review literatures that can help us identify managerial solutions to these challenges.

Many of the challenges mentioned recall the view of innovation management as a matter of network orchestration rather than of command and control. Taking the focal firm – commonly referred to as hub firm (Jarillo, 1988) – as point of departure, the literature on innovation network orchestration highlights three primary management tasks (e.g. Dhanaraj and Parkhe, 2006; Nambisan and Sawhney, 2011): knowledge sharing, appropriability regimes and network stability.

In order to create new knowledge combinations and consequently new innovations, the hub firm needs to facilitate proper knowledge sharing. On an epistemological level, this means that the hub firm needs to ensure a certain level of common knowledge, i.e. knowledge that enables communication of more specific knowledge across firms (Cohen and Levinthal, 1989; Lane and Maxfield, 1996; Carlile, 2004). On a social level, both the development of common knowledge and the transfer of specific knowledge can be facilitated through socialisation activities (Nonaka and Takeuchi, 1995) and the development of a shared identity within the network (Brown and Duguid, 1991). Even more practically, knowledge transfer can benefit from joint repositories and communication technologies that ensure sharing of information, plans, technologies and other assets (Nambisan and Sawhney, 2011). This leads us to the following proposition:

Proposition 5: *The likelihood of BMI success will increase if more knowledge is shared among the concerned actors.*

The hub firm also needs to establish a strong appropriability regime that mitigates free riding (Arrow, 1974) among network participants. Since the generation of new innovations requires an open, creative and generous attitude among network participants (Lane and Maxfield, 1996), it is generally not a good idea to rely on detailed contracts and threats of litigation to create a strong appropriability regime. Instead, evidence suggests that focus should be on establishing social norms and institutions that encourage trust, reciprocity, rich information sharing and procedurally just decision-making within the network (Lane and Maxfield, 1996, Uzzi, 1997, Dhanaraj and Parkhe, 2006). In addition, the literature on joint ventures and patent pooling indicates that joint asset ownership can also enhance commitment to joint goals and can also provide incentives for sharing rewards (Kogut, 1988). This is very much in line with previous business model research that holds forth governance structures and the nurturing of informal relationships as critical to BMI success (Amit and Zott, 2001; Santos et al., 2009). However, so far focus has been on firm-internal structures and relationships.

Proposition 6a: *The likelihood of BMI success will increase if the appropriation regime is strong.*

Proposition 6b: *The likelihood of BMI success will increase if the appropriation regime is based on informal institutions and social norms, as opposed to legal contracts.*

The hub firm must also manage network stability, defined as the participating actors' willingness to continue collaborating with one and other. Factors that can make innovation network become unstable include isolation, migration, attrition and the formation of cliques within the network (cf. Dhanaraj and Parkhe, 2006). Stability in innovation networks is a double-edged sword. If too unstable, innovation output is likely to suffer. If too stable, the network may instead become maladaptive to the relevant external technological and market context (cf. Christensen, 1997). Typically, however, lack of stability is the main problem, especially during the early stages when a new innovation network is formed (Dhanaraj and Parkhe, 2006) and proper norms of reciprocity and trust have not yet developed (Rapoport and Cammah, 1965). This leads us to the following proposition:

Proposition 7: *The likelihood of BMI success will increase if the emerging network of participating actors is stable.*

Consequently, the hub firm needs to ensure network stability. This can be accomplished by signalling legitimacy and trustworthiness to other actors. By projecting such an image, the hub firm will be better able to attract and retain relationships. One way of cutting this initial phase of instability short is to have the group jointly envision the benefits of future cooperation and let the grand rewards of future collaboration 'cast a shadow' onto the present, as suggested by Heide and Miner (1992).

As noted previously, BMI is difficult since firms have to act under conditions of restricted freedom. Each firm depends on other firms but can only impose limited control over them. Moreover, Schumpeter's (1934) notion of innovation as a process of creative destruction would suggest that some firms are likely to benefit from innovation at the expense of others. Therefore, those firms and indeed actors within firms, who stand to lose from BMI may rightfully be critical and try to block it. In order to succeed, the incentives of both friendly and more hostile actors must be understood. To succeed, the focal firm therefore needs to identify the incentives governing key actors in their environment, and then figure out ways of aligning those incentives with the intended changes.

Proposition 8: *The likelihood of BMI success will increase if the focal firm has good knowledge of the incentives and ambitions of the concerned actors.*

Previous research on competition in nascent markets has shown that innovative start-up firms, that want to influence actors that are critical to their new business models, often use soft-power tactics, in part because their limited resources make it difficult to enact more hard-power tactics (Santos and Eisenhardt, 2009). One such soft-power tactic is to exploit the tendencies and identities of other actors, i.e. entrepreneurs identify the behaviours and priorities of other actors and figure out ways to align themselves with these (cf. Lounsbury and Glynn, 2001). Other tactics include creating co-opting alliances with firms that need to be controlled, and even using deception and illusion to get other firms to behave in ways that benefit the focal firm. Compared to start-ups fighting for dominance in a nascent market, firms engaging in BMI may wish to focus more on cooperation and trust than power play and competition. Nevertheless, the use of soft-power tactics should be useful since these firms often find themselves in situations where executive control and the related option of hard-power tactics are not available at all.

Proposition 9: *The likelihood of BMI success will increase if the hub-firm uses soft-power tactics when influencing other actors.*

6 Conclusion and future research

Partly due to a lack of clear definitions, our understanding of challenges related to BMI is underdeveloped. In particular, while there is an emerging consensus that business models transcend firm and industry boundaries (Zott et al., 2011), extant research on BMI challenges has focused on intra-firm factors. While acknowledging the importance of these factors, we have sought to complement this perspective by exploring BMI challenges that relate specifically to the boundary-spanning nature of business models. Drawing on an open systems perspective on organisations, we have reviewed a set of relevant literatures to develop a series of propositions that can be used to guide future empirical research.

In particular, we first highlighted a number of structural challenges to BMI that stem from its open systems nature. First, managing in an open system entails challenges related to restricted authority since the hub firm does not have bureaucratic control over other participants. When engaging in BMI, firms are forced to act under conditions of restricted freedom as they are subject to interdependencies in established network constellations. As the surrounding network supplies the focal firm with resources and also gives it a competitive advantage, firms tend to resist attempts at BMI since such endeavours are often deemed risky. Additionally, the systemic nature of business models implies that the outcome of an imposed change is often unpredictable due to the presence of feedback loops. The high uncertainty associated with BMI is likely to further reduce firms' willingness to pursue such initiatives.

We have also suggested a number of managerial solutions to these difficulties. One important issue for overcoming the challenges posed by managing innovation across independent and heterogeneous organisations is to ensure knowledge sharing. A prerequisite for developing specific BMIs is to have enough common knowledge to facilitate fruitful discussions. A second issue is to ensure a strong appropriability regime based on trust. Importantly, this should not be done through the drafting of elaborate contracts, since this may stifle necessary creativity. Instead, focus should be on establishing appropriate social norms and institutions, something that is clearly related to knowledge sharing as mentioned above. Firms also need to pay attention to the degree of stability in the network. While too much stability may be dysfunctional, as a general rule the critical managerial challenge is to maintain stability rather than to ensure dynamism. Finally, the hub firm needs to understand and align the diverse incentives of the actors participating. When doing so, it is probably better to use soft-power tactics, as successful BMI depends on actors beyond the firm's hierarchical control.

In this paper, we have merely scratched the surface of the literatures that become relevant to understanding the structural challenges and managerial solutions related to BMI, once viewed from an open systems perspective. We hope that this effort will encourage others to continue probing the issue of BMI from an open systems perspective. More work is needed both in terms of theory development but also in the form of empirical investigations, such as rich case studies detailing the challenges and solutions to BMI from an open systems perspective.

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Note

- 1 One example of this is Osterwalder's early work (e.g. Osterwalder and Pigneur, 2004). While he now talks of the business model canvas, his dissertation and early work concerns the business model *ontology* in a way that clearly echoes the use of ontology within the information systems literature, i.e. a set of concepts and their relationships within a domain.