

Exploring the Connections Between Business Models and Cognition: A Commentary

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Abstract

In this paper, we reflect on an expanding literature that links theories of cognition and business models. Managers hold in their mind perceptual constructs or schemas of the business model. These guide the process of distinguishing between options and making choices. Those familiar with business model development will easily recognise that the perceptual construct provides only a summary of the business model, and that a more complex conceptualisation of how business model elements interact is needed. The business model is then much more than a visualisation. It is a schematic model of theorised interaction that is created, shaped, and shared over time. The underlying processes of this creation, shaping, and sharing are cognitive activities taking place at individual, organisational, and inter-organisational levels. Theories of managerial and organisational cognition are thus critical to understanding the acts of business modelling and business model innovation. Here we suggest some of the ways that business model and cognition literatures can be connected, present existing literature, and reflect on future avenues of research to explore the cognitive foundations of business modelling.

Keywords: Business models; business model innovation; cognition; mental maps; open innovation; schema; sensemaking

Introduction

The business model construct has become very popular in the strategy and innovation literatures. The definition of a business model has remained an object of some degree of controversy among scholars, some calling it a description

Business Models and Cognition

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(e.g. [Baden-Fuller & Morgan, 2010](#)), some an activity system (e.g. [Zott & Amit, 2010](#)), some a template (e.g. [Zott & Amit, 2008](#)), and some a framework (e.g. [Schneider & Spieth, 2013](#)), among other similes. What seems to be agreed is that a business model should include not just a description of the model but also a description of how value is created, distributed, and appropriated by the organisation ([Teece, 2010](#); [Amit & Zott, 2001](#)). This description can be a simple narrative (a recipe), a stylised archetype (a generic business model, or template, such as the bait-and-hook), or a framework of complementary components, such as found in the popular business model canvas ([Osterwalder & Pigneur, 2010](#)). An important point being that it describes not just the elements but also their interactions.

At its most superficial level a business model is a reified representation, a perceptual construct, of the activity system. Its more fulsome form includes a theory of how the business works and how the components of the activity system interact. This conceptualisation of how the constructs interact is the theory of the business model and incorporates ‘stories that explain how enterprises work’ ([Magretta, 2002](#)). Stories built with assumptions and hypotheses. Business modelling is not akin to modelling in any physical parallel. The building blocks (constructs) and the mortar (the interactions) exist only as concepts. The labour of building is an activity of the mind. This has led cognition scholars to explore the work of business modelling and business model scholars to seek a greater understanding of managerial and organisational cognition. For example, it has been suggested that the business model can be studied as a form of cognitive structure ([Doz & Kosonen, 2010](#)), mental map, or schema ([Martins, Rindova, & Greenbaum, 2015](#); [Narayan, Sidhu, Baden-Fuller, & Volberda, 2021](#) – this volume), of how the firm creates value. Recent studies have also highlighted how managers’ cognitions and sensemaking influence business model design ([Egffjord & Sund, 2020](#); [Sosna, Trevinyo-Rodriguez, & Velamuri, 2010](#)). Process studies of business model innovation (BMI) have highlighted the role of shared logics in enabling such innovation ([Bogers, Sund, & Villarroel, 2015](#); [Egffjord and Sund, 2020](#)) and how the information and knowledge search behaviour of managers affects the type of BMI being pursued ([Snihur & Wiklund, 2019](#)).

While these recent studies are encouraging, reviews of the business model literature continue to emphasise the links between business models and cognition as an area in need of further research ([Foss & Saebi, 2017, 2018](#); [Martins et al., 2015](#); [Massa, Tucci, & Afuah, 2017](#)). The cognitive underpinnings of business model elements are often mentioned but explicitly studied far less frequently. In this paper, we explore some of the links between theories of cognition and business models. We integrate into this discussion some of the findings of papers published in the fourth volume of the Emerald book series *New Horizons in Managerial and Organizational Cognition*. We conclude by inviting business model and cognition scholars to jointly explore the open questions of business modelling and cognition.

Business Models and Cognition

A look at the domain statement of the Managerial and Organizational Cognition (MOC) division of the Academy of Management suggests just how wide the field

of MOC has become and how many theories of cognition there are. Topics (and associated theories) mentioned in this statement include attention, attribution, decision-making, identity, ideology, information processing, creativity, learning, memory, mental representations and images, categories, cognitive frames, perceptual and interpretive processes, social construction, social dilemmas, and change. All of these and more represent possible theoretical avenues that can inform research on business models and BMI, and that in turn can gain from the study of such business models (Sund, Galavan, & Brusoni, 2018).

First and foremost, there is an emerging cognitive view on business models, which suggests that the business model serves as a form of mental model, logic, or recipe, of how a business creates and appropriates value. For example, Doz and Kosonen (2010, p. 371) argue that

business models stand as cognitive structures providing a theory of how to set boundaries to the firm, of how to create value, and how to organize its internal structure and governance.

This view of the business model as a cognitive knowledge structure (or knowledge structure *content*) is consistent with the more general cognitive view of strategy (Martins et al., 2015). A mental representation of a business model may indeed not be very different than a mental representation of similar constructs, such as a strategy, a market position, a vision, or any other construct representing how the organisation makes money, and how it relates to other actors, such as competitors, customers, or suppliers. The vast MOC literature concerned with such strategy-related knowledge structures can thus inform our study of business models. This literature hinges on the assumptions that such representations really do exist, and that managers create these mental structures to help process information and make decisions (Walsh, 1995). One difficulty is that scholars have thought up multiple competing theories (and labels) of what these structures are and how they develop. For example, mental models are models that are learned about how the world works, and that help managers solve problems (Kieras & Bovair, 1984), and make inferences, such as if-then predictions (Johnson-Laird, 2001). These mental models have by some been termed cognitive or mental maps (e.g. Fiol & Huff, 1992). Schema theory represents a similar approach, suggesting that knowledge structures take the form of schema, that are gradually learned, and are composed of components and their links, which grow stronger over time, as the individual gains experience within a domain of knowledge (Fiske & Dyer, 1985; Lurigio & Carroll, 1985).

Furnari (2015) argues that not just the content but the deeper causal structure of value creation and capture activities are important to the study of mental business models. One important observation from the MOC literature is that the complexity of mental maps within a domain is linked to job experience, and in the case of strategic knowledge, for example, of the business environment (Hodgkinson & Johnson, 1994), to the scope of a manager's job, such that a higher level manager can be expected to have broader and deeper knowledge. We can hypothesise this to be the case concerning a business model as well. In other words, we

can probably expect that a top manager will have a different and more complex cognitive representation of the business model than say a middle manager or a regular employee. In fact, some employees within larger organisations may not have much knowledge of the business model of the organisation at all. Or at least, they will not have framed this knowledge in terms of a business model.

Within the mental model literature, it is often assumed that such models can exist at the team level (Klimoski & Mohammed, 1994). It is also assumed that when such models are shared and aligned among team members, this will lead to superior performance (see e.g. the discussion of Mohammed, Klimoski, & Rentsch, 2000). The business model is regularly treated in the business model literature as a shared mental model within the organisation. Such a model would be the result of shared sensemaking processes within the organisation (Daft & Weick, 1984; Sund, 2013, 2015; Weick, 1995). However, managers throughout the organisation may not automatically fully share the mental business model. For example, Egfjord and Sund (2020) find that members of the core business and the innovation team within an incumbent have different perceptions of environmental changes, due to exposures to different information environments. The mental models of different teams within the incumbent are shaped by such differences in information and are thus not the same. Different mental models regarding the environment in turn lead to different views on what the business model is and should be (Bogers et al., 2015; Martins et al., 2015; Amit & Zott, 2015). Within the incumbent, it is mainly top management, as well as innovation teams within the organisation, who actively work on business model designs, and innovation, often employing standardised frameworks and visualisation tools (Täuscher & Abdelkafi, 2017). They are therefore the natural informants for studies on business (mental) models. There is an interesting line of research developing on the exact role of frameworks, visual tools, and innovation methods in shaping shared business model cognitions (Massa & Hacklin, 2021 – this volume). Henike and Hölzle (2021 – this volume) document that such frameworks have a significant effect on entrepreneurs' cognition too, stabilising such entrepreneurs' mental models. One could hypothesise that formal business model frameworks and business model development methods help entrepreneurs test their own presumptions and hypotheses, providing useful tools for accelerating learning (Ladd, 2021 – this volume). Over time, the impact of founder identity on the business model wanes (Van Boxstael and Denoo, 2021 – this volume). These findings may to some extent be transferable to the incumbent.

The business (mental) model can also be shared outside the firm, for example, with key stakeholders (Aspara, Lamberg, Laukia, & Tikkanen, 2013). For example, Wallnöfer and Hacklin (2013) suggest that the business model serves as a narrative device when new ventures pitch to business angels, who use this business model in their opportunity interpretation. Similarly, within one organisation, Podoyntsyna, Snihur, Thomas, and Grégoire (2021 – this volume) show how analogies and metaphors were used as narrative tools by Salesforce to construct a strong organisational identity. Storbacka and Nenonen (2011) suggest that market actors' mental representations of the business model are shared even more widely across organisational boundaries within the marketplace and can

be deliberately manipulated by individual actors. For example, [Snihur, Thomas, and Burgelman \(2018\)](#) examine how framing can constitute a strategic process that enables business model innovators to shape new ecosystems. [Narayan et al. \(2021 – this volume\)](#) demonstrate that industry insiders and outsiders may hold different schema of the business model. When there is incongruence with existing schemata, innovation originating outside the firm leads managers to search for information on opportunities or threats ([Greve & Taylor, 2000](#)).

BMI and Cognition

The innovation of business models has been a popular area of research for the past two decades. A shared understanding of the existing business model directs the way executives perceive new ideas for business models in incumbent firms ([Sund, Villarroel, & Bogers, 2014](#); [Sund, Bogers, Villarroel, & Foss, 2016](#)). Indeed, process studies of BMI have highlighted the role of shared logics in hindering or enabling innovation ([Bogers et al., 2015](#); [Egfford and Sund, 2020](#)) and how the information and knowledge search behaviour of managers affects the type of BMI ([Snihur & Wiklund, 2019](#)). Similar to [Daood, Calluso, and Giustiniano \(2021 – this volume\)](#), who suggest that a strong shared schema of the current business model may in fact be detrimental to radical BMI, [Bogers et al. \(2015\)](#) demonstrate how a strong dominant logic around the existing business model prevented radical BMI in incumbents. BMI is thus largely about schema change ([Martins et al., 2015](#)). It is thought that organisational identity can act as a barrier in this context ([Snihur, 2018](#)), but efforts at better understanding such barriers have often looked at the innovation process.

The process of BMI is typically hypothesised to involve several stages. For example, [Bogers et al. \(2015\)](#) identify two stages of exploration and exploitation, whereas [Jensen and Sund \(2017\)](#) precede these with a first awareness stage. They suggest that the BMI process starts with managers becoming aware of the need to explore new business models (awareness stage), which are then searched for (exploration stage), before being gradually tested and implemented (exploitation stage). An area that deserves further research is that of what exact circumstances or capabilities lead some incumbents to successfully become aware of the need for radical BMI, while others do not. [Teece \(2018, 2020\)](#) proposes three underlying process-related capabilities of sensing, seizing, and reconfiguring that he views as important dynamic capabilities for BMI. He surmises about sensing that ‘setting up an early-stage business model [...] depends as much on art and intuition as on science and analysis’ ([Teece, 2018](#), p. 43). This is to some extent confirmed by [Schneckenberg, Velamuri, and Comberg \(2019\)](#) who find that both problem sensing and intuitional insights help form new business model design logics. In very general terms, sensemaking and learning capabilities seem important for BMI as well ([Berends, Smits, Reymen, & Podoyntsyna, 2016](#); [Loon, Otaye-Ebede, & Stewart, 2020](#)). Finally, [Bellini and Catellazzi \(2021 – this volume\)](#) suggest that successful radical business model innovators can leverage the perception and control of their own cognition, i.e. possess what they call meta-cognition (cognition about cognition).

In the context of incumbent BMI, the stage of business model exploration appears particularly sensitive to competing logics between top management, middle management involved with the operations of the current business model, and innovators trying to explore and implement new business models (Bogers et al., 2015; Egfjord & Sund, 2020). Several studies have documented that such business model exploration may even result in tensions (Chesbrough, 2010; Kim & Min, 2015; Snihur and Tarzijan, 2018; Sund et al., 2016), at least some of which may be assumed to be due to cognitive differentiation, i.e. differences in mental models. According to Jensen and Sund (2017, p. 286),

for the organisation, there is an element of both unlearning and new learning, as business logic changes and transforms during the BMI process [...] The role of leadership moves from sense-making in the awareness stage to sense-giving in the business model exploration stage.

During the final stage of business model exploitation, focus moves away from experimentation and towards implementation and optimisation of the new business model (Jensen & Sund, 2017). At this stage, the perceived uncertainty surrounding the new business model lowers (Bogers et al., 2015), but a new set of dilemmas emerge. Managing a multi-business model organisation implies handling multiple business logics that may be complementary, neutral, or even substitutes in the marketplace (Sund et al., 2016). This leads to organisational complexity (Snihur & Tarzijan, 2018). Kim and Min (2015) point out the importance of complementary assets in determining how best to design the organisation after adding a new business model to the incumbent firm.

Open BMI and Cognition

As business models often focus on the network-level activities of an organisation (Foss & Saebi, 2017; Massa et al., 2017; Zott, Amit, & Massa, 2011), the sources and impact of BMI may also lie within networks, beyond the boundaries of a single organisation (Berglund & Sandström, 2013; Foss & Saebi, 2018; Vanhaverbeke & Chesbrough, 2014). In line with the literature on open innovation, it is therefore relevant to consider openness of BMI by exploring it as ‘a distributed innovation process based on purposively managed knowledge flows across organisational boundaries’ (Chesbrough & Bogers, 2014, p. 17). As such, the process of innovation can take place across organisational boundaries, which from a cognition point of view implies a need to consider how cognitive processes may span organisational boundaries. The MOC literature has documented shared thinking among strategic groups (Reger & Huff, 1993), referring to such groups as cognitive communities (Porac, Thomas, & Baden-Fuller, 1989). In the context of business models, it has been shown that they can be shared not just across business units but also with external stakeholders (Aspara et al., 2013). There is therefore

an obvious opportunity for the study of inter-organisational cognition in the context of BMI, or what we would call open BMI.

At the same time, given the intimate connection between open innovation and business models, for example, in terms of contingencies (Saebi & Foss, 2015), openness in business model development (or innovation) should be an integral part of how we consider BMI, in which cognition can help to shed light on some of the underpinnings. In an inter-organisational context, we may as such consider open BMI as the process of innovating a business model that spans organisational boundaries. On the one hand, we may better understand this notion by engaging the literature on cognition (as described earlier), and on the other hand, we may better understand it by drawing on what we know from the open innovation literature in relation to cognition.

As described by Bogers et al. (2017), research on open innovation behaviour and cognition not only focuses on individuals who are active in open innovation – often framed in an intra-organisational context – but to some extent also relates to organisational and boundary-crossing activities. Recent efforts have attempted to span across different levels of analysis in the context of open innovation, providing opportunities for integrating cognition and open innovation literature. More specifically, some of the MOC literature could inspire research on open BMI as it relates to cognitive limitations. These include barriers to integrating external knowledge (West & Bogers, 2014), barriers related to employees' cognitive style (Lowik, Kraaijenbrink, & Groen, 2017), search heuristics (Lopez-Vega, Tell, & Vanhaverbeke, 2016), and so-called syndromes, like the *Not-Invented-Here* or *Not-Sold-Here* syndrome (Burcharth, Knudsen, & Søndergaard, 2014). To this strand, Bez and Chesbrough (2021 – this volume) add the *Fear-of-Looking-Foolish* syndrome as a potential barrier to open BMI.

Concluding Remarks and an Invitation to Explore

The 'Business Models and Cognition' volume of *New Horizons in Managerial and Organizational Cognition* addresses a broad and challenging range of questions at the intersection of the business model, BMI, and MOC literatures. It is not, and could not be, a definitive range. We therefore extend an invitation to both the MOC and innovation management communities to embrace the theoretical and methodological opportunities that now exist for the study of cognition.

While research on the cognitive dimensions of business models and BMI has been increasing, there are numerous gaps in our knowledge. To illustrate these, it may be useful to consider the overviews of theoretical and methodological MOC advances presented in Galavan, Sund, and Hodgkinson (2018). Dual processing theory suggests that decision-making is subject to both conscious and nonconscious cognition. Furthermore, cognition can be 'cold' and rational, or it can be 'hot' and emotional (Hodgkinson & Healey, 2011; Hodgkinson, Sund, & Galavan, 2018). As discussed in this paper, existing BMI research has almost exclusively been concerned with conscious, cold, and rational cognition, inspired by classical MOC theories of mental mapping (Huff, 1990). The role of emotions

thus remains largely unexplored, although they have been acknowledged in the general innovation literature (Choi, Sung, Lee, & Cho, 2011). For example, Schneckenberg et al. (2019, p. 431) point out that

in the case of business models, the emotional and affective bond-ages to long-established value-creating and value capturing activity configurations risks resulting in escalation of commitment and cognitive inertia of senior managers.

The role of emotions could help clarify and deepen our understanding of the cognitive barriers to BMI in incumbent firms, and there are early indications that this may be particularly relevant in the study of family firm BMI (Rau, 2013).

Research has also been limited by context. We noted the importance of business models transcending organisational boundaries as traditional partnerships and also through open innovation. One of these boundaries is across state and private actors, often termed public private partnerships (PPPs). This is an area rich in questions and scarce of answers. Given the need to have shared understanding of business models, how do those with a focus on public value perceive, engage, and build working relationships with those supporting an agenda of private value capture? How are the varying philosophies and objectives negotiated and how is the trust necessary for sharing built? How is innovation (with its inevitable failures) that is embraced by the private sector conceptualised in the public sector? Such questions are particularly important for the emerging strand of literature on sustainable business models, where wider objectives are considered than private profit (see e.g. Bocken, Short, Rana, & Evans, 2014; Geissdoerfer, Vladimirova, & Evans, 2018).

We also need to understand failures in BMI, particularly where the model succeeds in some cases and fails in others. Where the innovation fails, is this (simply) to do with differences in firm capabilities, or is it to do with failures in representation and cognition, failures in actioning the representation, or even deliberate misrepresentation of the reality? Business modelling brings with it the challenge that in order to be implemented the models must first be conceived (Chatterjee, 2013). It is in that sense a forward-looking activity with very different learning challenges to the backward-looking gaze of experiential learning (Berends et al., 2016).

Recent work has highlighted that managers involved in system dynamic business modelling develop more accurate representation of their business models (Moellers, von der Burg, Bansemir, Pretzyl, & Gassman, 2019). This brings with it a cognitive gap between the representation of those involved in the modelling and those outside the process. Moellers et al. (2019) describe this gap in terms of levels of model dimensionality, with those involved in the modelling understanding the complexity, and those outside becoming overwhelmed and treating the model as a black box. Using system dynamics holds great promise but brings with it enormous challenges of shared understanding and trust that we know little about.

Similarly, the role of nonconscious cognitive biases during both entrepreneurial and incumbent BMI remains unexplored. For example, what is the role

of heuristics in business modelling? How does overconfidence and the problem of positive illusions affect business model exploration? Such questions remain largely unexplored in the business model literature and could open a path for exploration.

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