



UNLOCKING THE HIDDEN VALUE OF CONCEPTS: A COGNITIVE APPROACH TO BUSINESS MODEL INNOVATION

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We advance a theory of how business models can be innovated proactively in the absence of exogenous changes, through processes of generative cognition. We contribute to the cognitive perspective in strategy by analyzing business models as schemas that organize managerial understandings about the design of firms' value-creating activities and exchanges and by theorizing how they can be innovated through processes for proactive schema change. Drawing on cognitive psychology research on two major cognitive processes through which individuals change their schema to cope with novelty, analogical reasoning and conceptual combination, we theorize firm-level strategic processes for designing innovative business models. Copyright © 2015 Strategic Management Society.

INTRODUCTION

Companies increasingly find the need to innovate not only by developing new products and services, but by creating or modifying business models. GE's 2013 Global Innovation Barometer survey of more than 3,000 senior executives in 25 countries finds that a majority of the executives (52%) reported the development of new business models as a strategic priority for their firms. A recent report notes that of the 26 companies that have been founded since 1984 and entered the *Fortune 500* list from 1997 to 2007, a majority owed their success to business model innovations that either transformed existing industries or created new ones (Johnson, 2010). In line with their growing prominence among managers,

entrepreneurship and strategy scholars have also increasingly begun to study business models as an important unit of analysis that is distinct from the firm, industry, or network (Zott, Amit, and Massa, 2011). A business model is defined as the designed system of activities through which a firm creates and captures value (Zott and Amit, 2010). In a recent comprehensive review of research on the topic, Zott *et al.* (2011) concluded that while the construct is clearly established, we need to develop better understanding of how new business models are created and how existing ones change. They identified the need for a better understanding of business model innovation as an important direction for research in the area.

The goal of this article is to respond to this call by building on the cognitive perspective in strategy and on research on generative cognition in psychology to articulate systematic processes through which new business models can be ideated and designed. Our ideas represent an important departure from current research on business model innovation, which analyzes it as either a response to exogenous

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technological and regulatory shocks (e.g., Amit and Zott, 2001; Teece, 2010) or as a result of trial-and-error experimentation in response to changes in the environment (e.g., Chesbrough, 2010; McGrath, 2010). While these perspectives effectively explain how business models change to respond to environmental changes, they offer little insight into the possibilities for business model innovation in the absence of such exogenous change.

Yet, as anecdotal evidence suggests, new business models are often the source, and not the outcome, of industry change. Southwest Airlines, Walmart, and Starbucks are among the most salient examples of such changes. Each of these companies has generated tremendous shareholder value by designing new business models in the absence of a need to respond to either technological or regulatory changes. Instead, the new business models that these firms—and other business model innovators—designed created large-scale disruptive industry change (Markides, 2008). Therefore, understanding the mechanisms that enable business model innovation in the absence of exogenous change is critical to understanding the possibilities for value creation through business model innovation.

In this article, we take a step in this direction by building on the conceptualization of business models as reflections of managerial schemas and explicating the cognitive logic and processes through which schemas can be changed to ideate and design new business models in the absence of exogenous change. Our ideas are rooted in the cognitive perspective in strategy research (Barr, Stimpert, and Huff, 1992; Gavetti, Levinthal, and Ocasio, 2007; Gavetti and Rivkin, 2007; Narayanan, Zane, and Kemmerer, 2011; Rajagopalan and Spreitzer, 1997) and research on generative cognition in psychology (Ward, 2004). We build on these ideas to theorize how two cognitive processes that individuals use naturally to cope with novelty—*analogical reasoning* (Gentner, 1983) and *conceptual combination* (Wisniewski, 1997a)—can be developed as firm-level strategic processes to ideate and design new business models.

Our theory extends current research on business model innovation by explaining how business model innovation can occur in the absence of exogenous change and how new business models can be ideated and designed more generally. It presents a perspective on business model innovation that differs from, but complements, those presented by the existing *rational positioning* and *evolutionary*

learning perspectives. In particular, by articulating a methodology for proactively generating business model innovation, it addresses limitations in managerial implications of current perspectives on business model innovation. Our ideas also contribute to current efforts to provide a more dynamic, forward-looking analysis within the cognitive perspective on strategy (Ocasio, 2011; Porac and Tschang, 2013).

The article proceeds as follows: we first review the literature on business models to examine the three current underlying theoretical perspectives on business models and highlight their limitations in explaining business model innovation in the absence of exogenous change. Next, we briefly review psychology and strategy research on cognitive representations (schemas), emphasizing their key characteristics and mechanisms through which they change. Then, we build on these ideas to theorize two strategic processes through which firms can innovate their business models in the absence of exogenous change. We illustrate our theoretical ideas with examples of such business model innovations. We conclude with a discussion of our contributions.

CURRENT PERSPECTIVES ON BUSINESS MODELS AND BUSINESS MODEL INNOVATION

Business model researchers increasingly converge on a definition of business models as systems of ‘interdependent organizational activities centered on a focal firm’ (Zott and Amit, 2010: 217) that are ‘made up of components, linkages between components, and dynamics’ (Afuah and Tucci, 2001: 4). While researchers agree on the view of business models as systems of activities, they differ in their understanding of how firms develop such systems. Reviewing the literature in the area, we identified three theoretical perspectives on business models with varying explanations for business model change. Each of these perspectives is consistent with a core theoretical school in strategy research—the *rational positioning* school, the *evolutionary learning* school, and the *cognitive* school (see Gavetti and Rivkin (2007) for further discussion of these schools in the context of strategy creation, and Rajagopalan and Spreitzer (1997) in the context of strategic change).

The rational positioning view

The rational positioning view treats business models as purposefully designed systems (Zott and Amit, 2010) that reflect rational managerial choices and their operating implications (Shafer, Smith, and Linder, 2005; Casadesus-Masanell and Ricart, 2010). As Casadesus-Masanell and Ricart (2010: 198) explain, business models represent ‘concrete choices made by management about how the organization must operate and the consequences of these choices.’ Zott and Amit (2010: 218) further argue that managers ‘shape and design both the organizational activities and the links (transactions) that weave activities into a system. Such purposeful design—within and across firm boundaries—is the essence of the business model.’ Further, to the degree that the rational perspective sees strategists as ‘highly rational managers (who) survey an environment and deductively apply economic logic to their observations’ (Gavetti and Rivkin, 2007: 424), their choices regarding the components and linkages in a business model generate an optimal design for value creation or capture within a given context.

Viewed as optimized systems of activities, business models are seen as changing as a result of exogenous shocks that shift the objective interdependencies among firms and, therefore, require managers to make new design choices that optimize the business model to the new conditions (Amit and Zott, 2001; Teece, 2010). The logic of this perspective is captured by Teece’s (2010: 188) argument that ‘. . . when the underlying technology changes, and an established logic for satisfying consumer needs . . . is overturned, the business model must change too.’ For example, the emergence of the Internet represented a technology change that created new competitive conditions, resulting in new business models composed of new activity systems seeking to capitalize on e-business opportunities (e.g., Dubosson-Torbay, Osterwalder, and Pigneur, 2002; Timmers, 1998). Similarly, incorporating advances in information and communication technologies into existing products necessitated changes in the firms’ business models (Björkdahl, 2009). As these examples illustrate, research on business model innovation as adaptation to technological changes focuses on how firms use business models to respond to the changes in their interdependencies with exchange partners as a result of technological change.

Similar findings have been reported in examinations of business model change in response to regu-

latory change. For example, in a study of the impact of changes in Finnish and European banking regulations on the Finnish banking industry, Bask *et al.* (2012) found that the regulatory changes triggered an expansion of services from incumbent banks and prompted new entrants, changing the business models in the retail banking sector. The business models of the larger, incumbent Finnish banks converged on a ‘financial supermarket’ model, while new entrants from insurance, retail, and logistics services provided banking services to their existing customers. Thus, while the trigger of business model innovation is different, the mechanisms of business model innovation in the face of regulatory change are similar to those under conditions of technological change. In both cases, business model change represents a search for a new optimal design that repositions the firm in response to changing interdependencies caused by exogenous environmental changes.

The evolutionary view

The evolutionary approach to understanding business models is based on a view that strategists engage in local search ‘in response to specific problems or opportunities;’ this view emphasizes the role of routines, the relative inertia of routines, and incremental strategic change driven ‘more by trial than by forethought’ (Gavetti and Rivkin, 2007: 424). While recognizing that managerial cognition is a potential source of an initial business model (Sosna, Treviño-Rodríguez, and Velamuri, 2010), an evolutionary view of business models primarily focuses on the role of experimentation in the generation and change of business models (e.g., Chesbrough, 2010; McGrath, 2010). This is because, as McGrath (2010: 253) argues, ‘many of the constraints that will turn out to be competitively important aren’t known at the time that critical resource allocation decisions need to be made’ (and it takes) ‘marketplace experimentation and time to discover the most effective models.’ Thus, the evolutionary view ‘sees business model development as an initial experiment followed by constant fine-tuning based on trial-and-error learning’ (Sosna *et al.*, 2010: 384).

The evolutionary learning view of business model innovation argues that change in business models is generated by external uncertainty, requiring managers to engage in experimentation until they find a system of activities that allows them to compete effectively within their external conditions

(Chesbrough, 2010; McGrath, 2010; Sosna *et al.*, 2010). This process is illustrated in Chesbrough and Rosenbloom's (2002) analysis of the evolution of the business model of 3Com, which was established to commercialize the Ethernet networking protocol developed at Xerox's Palo Alto Research Center (PARC). 3Com initially utilized the business model of a computer systems company focused on selling complete systems using a direct sales force. Following the launch of the IBM PC, it experimented with and arrived at a new business model based on selling add-in boards to the IBM-compatible PC market through retailers and resellers. Chesbrough (2010: 356) uses this and other examples of business model innovation through experimentation to conclude that business model innovation may not be the result of any grand master plan or 'a matter of superior foresight *ex ante*—rather, it requires significant trial and error, and quite a bit of adaptation *ex post*.'

Importantly, the evolutionary perspective proposes that business model innovation occurs through a search for incremental modifications that improve performance and reduce the necessity for wholesale system overhaul. For example, Holloway and Sebastiao (2010) argue that firms establish the critical interdependencies underlying their business models through ongoing market testing of various hypothesized business models. Such frequent experimentation enables managers to adjust their business models on an ongoing basis, often incrementally, consequently insulating firms from potentially dangerous wholesale changes to their business models. Similarly, McGrath (2010) discusses a comprehensive process of incremental experimentation for the development of an appropriate business model within an industry following technological and regulatory change. She presents evidence that external developments, such as growth of the Internet or changes in health care regulations, lead to industry-wide experimentation and learning that guide incremental investment of resources into an emerging business model and ongoing innovation in business models. Additionally, research on service business model innovation finds that while manufacturing firms have been adding service businesses in response to decreasing margins due to competition and product maturity, they face a significant learning curve—including adjustments to their management systems—in making their new service business models profitable (Visnjic Kastalli and Van Looy, 2013; Suarez, Cusumano, and Kahl, 2013).

The cognitive view

While the rational positioning and evolutionary views dominate research on business models, several scholars have suggested that business models reflect managerial mental models, or schemas. For example, Doz and Kosonen (2010: 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 organise its internal structure and governance.' This conceptualization of business models is consistent with the cognitive perspective within strategy research that focuses on managers' mental representations, emphasizing that each decision maker develops a somewhat unique view of reality (e.g., Gavetti and Levinthal, 2000; Gavetti and Rivkin, 2007; Gavetti, Levinthal, and Ocasio, 2007; Kaplan, 2011; Narayanan *et al.*, 2011; Porac and Thomas, 1994; Rajagopalan and Spreitzer, 1997; Walsh, 1995). Further, some scholars have suggested that 'the owner-manager's cognition and sensemaking provides the most important input into the initial business model design' (Sosna *et al.*, 2010: 387). George and Bock (2011) have similarly argued that strategists can embody distinct strategic visions about the opportunities for value creation and capture in their industries, in the business models they create. While these suggestions represent important steps toward developing a cognitive perspective on business models, they stop short of delineating its application to understanding how business models change.

In summary, current research on business model innovation emphasizes that business models are designed or evolved to be optimal for their competitive conditions and change primarily in response to exogenous shocks, such as changes in technology or regulation (see Demil and Lecocq, 2010, for an exception). The rational positioning school represents business model innovation as outcomes of rational redesign processes focused on creating a new system of components and linkages that optimize the business model to new interdependencies created by exogenous shocks. The evolutionary learning school draws attention to the incremental process of refining a business model to improve fit with changing interdependencies caused by external developments. Thus, these current views give primacy to the external context as the driver of business model innovation.

Further, current perspectives espouse underlying assumptions that limit their applicability to

explaining how business models may change in the absence of exogenous changes. As Gavetti and Rivkin (2007: 424) have argued, the positioning school portrays managers as highly rational decision makers who survey the environment to identify best positions and ‘has produced relatively little research on how integrated sets of activities emerge,’ with Sigelkow (2002) being an exception. The evolutionary school exhibits general skepticism about ‘how much deliberate cognitive efforts affect behavior’ (Gavetti and Rivkin, 2007: 424), as it emphasizes local search and trail-and-error learning. Finally, the cognitive school has been criticized as being overly focused on how managers are limited in their cognitive processes by bounded rationality and other cognitive constraints—the so-called ‘small-brained’ view of managers in cognitive strategy research (Hastie, 1991; Ocasio, 2011; Porac and Tschang, 2013). As a result, all three offer limited insights into processes for ideating and designing new business models.

In this article, we focus on this gap by proposing a theory of how structured cognitive processes can be utilized to innovate business models in the absence of exogenous change. In the section that follows, we discuss relevant research from the cognitive school in strategy and from cognitive psychology to: (1) highlight key characteristics of business models schemas; and (2) theorize processes through which they can be changed strategically.

A COGNITIVE APPROACH TO BUSINESS MODEL INNOVATION

Key characteristics of schemas as cognitive structures

Cognitive psychologists and managerial cognition scholars typically refer to mental representations as ‘schemas’ defined as ‘cognitive structures that represent knowledge about a concept or type of stimulus, including its attributes and the relations among attributes’ (Fiske and Taylor, 1991: 98). Schemas refer to both ‘people’s *theories* and *concepts* about the world’ (Fiske and Taylor, 1991: 98, italics added)—that is to knowledge about specific stimuli—as well as to the organization of knowledge in larger structures. Furthermore, although schemas organize individual knowledge, much of their content is based on ‘culturally available schemata—knowledge structures that represent objects or events and provide default assumptions about their charac-

teristics, relationships and entailments under conditions of incomplete information’ (DiMaggio, 1997: 269).

Schemas represent accumulated knowledge and provide frames for interpreting new information (Fiske and Taylor, 1991). They encompass a broad range of representations, ranging from simple yet abstract ones, such as food or competitor, to ones that represent concrete activities, such as going to a restaurant or negotiating with a channel partner, to ones that refer to complex social phenomena, such as gender stereotypes or industry categories. Schemas, therefore, organize knowledge at different levels of abstraction and scope and may include concepts, models, scripts, or theories. Despite these differences, schemas have a relatively consistent basic structure, consisting of: (1) attributes, which are called ‘slots’ and can take on various values called ‘fillers’ which themselves can be subschemas; and (2) relations among them that organize or structure the slots and the interactions among them (Gureckis and Goldstone, 2010; Wisniewski, 1997b). For example, ‘a schema for *elephant* might include the slots *color* and *habitat* and the typical fillers *gray* and *zoo*, respectively’ (Wisniewski, 1997b: 62). Similarly, a schema for competitive strategy might include slots for *scope* and *advantage*, and typical fillers may be *global* and *low cost*, respectively. These characteristics of schemas are important for understanding that schemas organize knowledge through a combination of attributes and relations among them and that they can be changed systematically by reorganizing their structures.

Schema change

The majority of research in both psychology and strategy has emphasized the inertial properties and effects of schemas. For example, Ocasio (2011) and Porac and Tschang (2013) have recently stressed that cognition research in strategy has been focused primarily on inertia and cognitive constraints. This focus of cognition research is not surprising, given that one of the primary functions of schemas is to provide cognitive efficiency by simplifying and filtering out information. As a result, schemas tend to be self-reinforcing, filling data gaps with typical information, ignoring discrepant but possibly important information, and discouraging disconfirmation of their content and revision of their structures (Gioia, 1986).

Recent research in both strategy and psychology, however, points to important sources of dynamism in cognition, thereby providing a theoretical foundation for understanding how schemas can be changed proactively. First, recent research on attention highlights the simultaneous operation of multiple attentional processes that differentially affect the stability and change in allocation of attention and its consequences for schema use (Ocasio, 2011; Ocasio and Joseph, 2008). In particular, the distinction between selective attention—which ‘describes the process by which individuals focus information processing on a specific set of sensory stimuli at a moment in time,’ and executive attention—which ‘involves allocating controlled (nonautomatic) cognitive resources . . . to information independent from incoming sensory data and to diverse or schema-inconsistent stimuli . . . (Parasuraman, 2000)’ (Ocasio, 2011: 1287)—is particularly important for understanding how schemas change. Whereas selective attention is stabilized by and stabilizes existing schemas, executive attention enables change in schemas through the controlled, nonautomatic allocation of cognitive resources (Ocasio, 2011; Ocasio and Joseph, 2008). Such proactive cognitive search facilitates the processes that reorganize existing schemas as discussed next.

Second, within the cognitive psychology literature, recent research on creative or generative cognition (i.e., research on how knowledge is reorganized rather than stored and used) suggests that schemas can be changed, and entirely new schema can be created through specific mental operations that enable individuals to reorganize their existing knowledge and cope with novelty (Ward, 2004; Ward, Smith, and Vaid, 1997). Two cognitive processes involving controlled mental operations on *the structures of schemas* have been identified: analogical reasoning and conceptual combination (Ward, 2004; Ward *et al.*, 1997). Both processes occur naturally in situations in which individuals need to make sense of novelty and have been shown to span a broad spectrum of situations.

Analogical reasoning refers to use of the knowledge contained in the schema about one domain (termed ‘source’) to interpret information in another domain (termed ‘target’) (Gentner, 1983). It involves selecting an analog, mapping the attributes of the analog to the target to make inferences, and adapting the inferences to take into account the unique attributes of the target (Holyoak and Thagard, 1995). According to psychologists, analogical reasoning is

an integral part of human thinking, and it varies in levels of complexity, abstraction, and automaticity. Analogical reasoning differs from ‘literal similarity statements, applications of abstractions, and other kinds of comparisons’ in that in analogical reasoning ‘(a) (r)elations between objects, rather than attributes of objects, are mapped from base (or source) to target; and (b) (t)he particular relations mapped are determined by *systematicity*, as defined by the existence of higher-order relations’ (Gentner, 1983: 155, italics in original). Thus, the generative potential of analogical reasoning derives from its focus on ‘structure-mapping’ in which there is a high degree of mapping of relations (and a low degree of mapping of attributes) from the base concept to the target concept (see Gentner (1983) and Gentner and Kurtz (2006) for a detailed discussion).

Conceptual combination is a cognitive process through which a focal/target concept is combined with a modifier/source concept in order to create a new concept. It preserves core similarities with the target concept, but it generates essentially a new concept through the integration of attributes derived from the modifier/source concept (Wisniewski, 1997a). The new concept results not only from the incorporation of attributes of the modifier, but also from the emergence of new attributes that were not present in either constituent concept (Murphy, 1988). Conceptual combination is similar to analogical reasoning in its use of a second (source) concept to reorganize the knowledge associated with the first (target) concept by changing some of its attributes, structure, or both. However, it is different from analogical reasoning in the ways in which the source concept is used. Analogical reasoning relies on the identification of similarities that can be profitably leveraged to broaden the understanding associated with the target concept. Conceptual combination represents a search for a difference between two concepts that can be integrated into the target concept to alter its attributes, thereby creating a new concept (Wisniewski, 1996, 1997a). Thus, the generative potential of conceptual combination derives from its facility in incorporating attributes or structures from a wide range of concepts to modify a target concept, so that fundamentally new attributes, unavailable in either preexisting concept, can emerge.

In our view, analogical reasoning and conceptual combination have several characteristics that make them particularly useful mechanisms for business model innovation. First, they involve controlled

information processing and targeted mental operations to reorganize the structure of existing schemas. Thus, although these processes occur naturally at the individual level, they involve systematic steps that can be implemented as strategic processes at the firm level. Second, both processes involve leveraging of preexisting knowledge. Their effectiveness in innovation arises from the possibility of using this preexisting knowledge from another domain to inform the understanding of one's current domain by relying on familiar concepts and relations among them. At the organizational level, such preexisting knowledge can provide managers with a reliable structure with understood interrelationships that can be used to explore new possibilities. In the next section, we theorize how these naturally occurring cognitive processes that help individuals make sense of novelty can be developed as strategic firm-level processes for business model innovation by transforming managers' business model schemas. To this end, we first highlight some distinctive characteristics of business model schemas.

Business model schemas

Business model schemas can be defined as cognitive structures that consist of concepts and relations among them that organize managerial understandings about the design of activities and exchanges that reflect the critical interdependencies and value-creation relations in their firms' exchange networks. This conceptualization is consistent with prior research emphasizing that business models are designed systems of activities that reflect managerial choices and their operational implications (Casadesus-Masanell and Ricart, 2010; Shafer *et al.*, 2005; Zott and Amit, 2007, 2010). Viewing business models as reflections of managerial schemas recasts the interdependencies that business models organize from an objective, environmental construct (Christensen and Rosenbloom, 1995; Thompson, 1967) to a cognitive construct that has the potential to create distinct conceptualizations and innovative reconceptualizations of environmental situations. As a result, business model schemas can be understood as vehicles for enactment of environments.

While the idea of business models as managerial schemas is just emerging in the literature, several distinctive characteristics of these schemas must be articulated. First, business model schemas are organized by a specific logic of value creation that guides the structuring of activities and transactions of the

firm (Afuah and Tucci, 2001; Casadesus-Masanell and Ricart, 2010). Casadesus-Masanell and Ricart (2010: 197) further argue that the logic that creates coherence in business model schemas encompasses both '*design elements* (content, structure, and governance) that describe the activity system's architecture, and *design themes* (novelty, lock-in, complementarities, and efficiency) that describe its sources of value creation' (as articulated by Zott and Amit (2010)). This argument suggests that whereas managerial schemas for strategy are frames for decision choices, business model schemas are design logics (Porac and Tschang, 2013) that guide how managers structure relations among attributes, even when they change specific attributes or links. As design logics, business model schemas provide an underlying logic for consideration and exploration of new possibilities. Chesbrough (2010) argues that such logic limits the range of possibilities a firm would explore, and Winter and Szulanski (2001) argue that even the pursuit of a successful replication strategy requires exploratory development of a new business model schema.

Second, because of their highly structural nature, business model schemas are likely to be particularly inertial and cannot be easily modified through piecemeal modifications and extensions as other schemas can be (Rindova and Petkova, 2007). This point is underscored by Doz and Kosonen (2010: 371), who argue that there is a reinforcing relationship between business models as 'actual' relationships that are articulated in procedures or contracts and embedded in (often) tacit action routines' and as 'their collective cognitive representation,' as a result of which 'business models tend also to be naturally stable and hard to change. George and Bock (2011: 102) have further argued that unlike a strategy, 'a business model is inherently nonreflexive.' These arguments suggest that business model change may require executive attention, as well as dedicated strategic processes, in the absence of an exogenous imperative.

Business model innovation through schema change

In this section, we develop our theory of business model innovation based on schema change. We theorize how two generative cognition processes—analogy reasoning and conceptual combination—can be used to ideate and design new business models. As noted earlier, at the individual level, these are natural cognitive processes that are

triggered by the need to make sense of novel stimuli. We will articulate how they can be used as systematic innovation processes at the firm level to create new business models. We use several examples to illustrate our ideas. For analogical reasoning, we use as examples Tesla Motors, a manufacturer of fully electric automobiles based in California, Aravind Eye Care, a low-cost ophthalmic care provider based in India, and Better Place, a now-defunct 'electric miles' service provider based in California but operating largely out of Israel. For conceptual combination, we use as examples Starbucks Coffee Company, a specialty coffee retailer based in Seattle, Washington, Cirque du Soleil, a producer of circus-based artistic entertainment based in Montreal, Canada, and Best Buy, an electronics 'big-box' retailer based in Richfield, Minnesota.

Our theory presents analogical reasoning and conceptual combination as two strategic processes for business model innovation that can be enacted in four-step sequences. The four steps in each process capture how an existing schema—the source concept—that is currently external to the firm, and often external to its industry, can be used to reorganize the firm's current business model schema or the existing dominant business model in an industry—the target concept—to create a new business model schema for the firm. Although the content of the four steps differs across the two processes, the two processes have a similar sequential structure consisting of: (1) identification of a source concept to compare to the target business model schema; (2) comparison of the structure of the source concept to the target business model schema to determine what elements (attributes, relations, or subschema) of the source concept may create value in the context of the target; (3) integration of elements from the source concept into the target business model schema; and (4) modification of the borrowed elements from the source concept to fit the context of the target business model.

The strategic processes that we theorize require executive attention and controlled information processing to search for target schemas, carefully investigate their attributes and potential fit, and rework the existing schemas.¹ In their discussion

¹ We note that there are other cognitive processes based on more automatic (rather than controlled) information processing (e.g., intuition, an epiphany, serendipity) that can result in the generation of new business models. We limit our focus to controlled information processing since the goal of our article is to articulate processes that managers can deploy systematically as part of their strategy making.

of the challenges of business model change, Doz and Kosonen (2010: 371) similarly highlight the need for 'sharpness of perception,' 'intensity of awareness,' and attention to strategic development. These are all qualities of what Ocasio (2011) terms organizational attentional engagement and identifies as a key process generating proactive change in strategic cognition. Attentional engagement, therefore, is an underlying enabler of the processes we theorize.

Our theory focuses on how strategists can use concepts to generate new lenses in a manner that is particularly relevant to innovating business models, due to their complex, systemic, and architectural characteristics. Put in the context of general innovation research, our theory pertains to the 'idea generation' phase (Hansen and Birkinshaw, 2007), as it explains how strategists originate new designs of potentially value-creating new business models. We focus on this step, rather than the entirety of the business model innovation process, because, as we show in our literature review of business models, this is the step in business model innovation that is least understood. Finally, whereas idea generation processes are important for all innovation, they are particularly critical for business model innovation because business models are complex structural representations that are difficult to ideate from scratch (Baden-Fuller and Morgan, 2010). Further, because business model schemas are defined by their structure and logic, generative cognition mechanisms that enable structural recombination—as is the case of analogical reasoning and conceptual combination—are likely to be particularly useful in developing strategic processes for ideating new business models.

Business model innovation through analogical reasoning

The process of analogical reasoning, defined as the application of structured knowledge from a familiar domain to a novel domain, has received attention both in psychological research on creative cognition (Gentner, 1983; Gentner, Holyoak, and Kokinov, 2001) and in management research on entrepreneurship (Cornelissen and Clarke, 2010), innovation (Rindova and Petkova, 2007), and strategy making under uncertainty (Gavetti, Levinthal, and Rivkin, 2005). This is because analogies are powerful means for framing unfamiliar experiences to enable action (Gavetti *et al.*, 2005; Hargadon and Douglas, 2001).

They do so by providing a basic relational structure for framing and understanding stimuli that are too novel and too complex to afford ready interpretation. What has received less attention is how analogical reasoning can be used to change the familiar, that is, as a source of innovation. We theorize how analogical reasoning can be used to reexamine understanding within a familiar domain. We argue that within a familiar domain, even if direct interpretation is possible by application of an existing schema, use of executive attention can bring to the fore new concepts that can be assessed through analogical reasoning to reconceptualize the familiar and transfer a new relational structure that can guide the reorganization of existing interdependencies in new ways.

To apply analogical reasoning to business model innovation, firms can follow the four-step process described earlier. *First*, managers must select an analog as the source concept whose relational structure could potentially be applied to reorganize the target concept to address a particular strategic problem or opportunity. For example, Tesla Motors found a useful analog in Apple Computers, seeking to position its distinctive technology (electric motors) favorably relative to the dominant design technology (internal combustion engines) in the auto industry. Tesla Motors founder Elon Musk (and the designer of the Tesla S) has been reported to refer to the Model S as ‘his ‘Macintosh’ ’ (Kunzler, 2013: 1). Similarly, with a goal of providing cheap, ubiquitous cataract surgery to the poor in India, the founder of Aravind Eye Care, Dr. Govindappa Venkataswamy (‘Dr. V’) found a ready analog in McDonald’s. As Mehta and Shenoy (2011: 16) observed, ‘Dr. Venkataswamy saw in McDonald’s the power of standardization, product recognition, accessibility, and scale. ‘Just as fast food is affordable to many lower-middle-class families in the West, in developing countries we can organize to provide affordable cataract operations,’ he declared in an interview in the late 1980s.’ Similarly, Shai Agassi, the founder of Better Place, analogized from the cellular phone industry to sell ‘electric miles’ whereby a purchaser of an electric car contracts with the company for a certain amount of electric charge that is provided through a ubiquitous network of charging and battery exchange stations. He has stated that ‘It’s a subscription system much like cellular providers have,’ in which ‘you sign up for a certain number of miles a month’ (Squatriglia, 2007: 1).

In understanding this step of business model innovation through analogical reasoning, it should be

noted that a wide variety of concepts can be used as analogs. Evidence exists that new firms often use industry types as analogs to inform the design of their business models. For example, early Internet search engines used ‘media’ as the industry type concept to guide the development of their portal business models (Gavetti and Rivkin, 2007; Rindova and Kotha, 2001). As our examples illustrate, particularly effective analogs can be unearthed by examining contexts in which firms have addressed problems or opportunities similar to those on which the innovating firm is focusing. This requires controlled information processing and wide search in contexts that may appear distant from the industry context in which they are operating. Indeed, systematically searching in nonobvious contexts for an analog can help managers find analogs that can produce powerful changes in the target business model. For instance, illustrating the nonobviousness of McDonald’s as an analogy for cataract surgery, Dr. Larry Brilliant, a leading physician and former director of Google’s philanthropic arm, commented that ‘Dr. V came to my office, and when he talked about eliminating blindness, you got the feeling that this man was either a saint or a complete nut. He kept talking about McDonald’s and hamburgers, and none of it made any sense to us’ (Mehta and Shenoy, 2011: 133).

Second, managers must compare the relational structure of the analog concept to that of the target concept (generally referred to within the literature on analogical reasoning as ‘mapping’ of relational structures) to determine what elements of the analog concept could be used to create value in the context of the target concept. For example, in mapping how Apple overcame the disadvantage of competing in its industry using a nondominant design technology, Tesla Motors founder Elon Musk recognized the need to compete on high-end design. In discussing his strategy, he ‘notes that the vehicle has some very Apple-like design characteristic—every detail has been given the sort of extraordinary attention that you rarely see in vehicle design (or design in general)—and all this to make the Tesla Model S as distinctive as possible’ (Kunzler, 2013: 1). Similarly, mapping the mechanisms that McDonald’s uses to deliver its product across a wide range of geographies enabled Dr. V to identify the system of activities that enable the standardization, product consistency, and cheap production that he needed in his own business model to make cataract surgery cheap and ubiquitous. As he noted, ‘My goal is to

spread the Aravind model to every nook and corner of India, Asia, and Africa . . . Can't we do what McDonald's and Burger King have done?' (Rangan 1993: 2).

The success of this step in the process of business model innovation through analogical reasoning depends on the appropriate identification of relevant similarities to inform modifications to the target (Holyoak and Thagard, 1995). In developing new business models through analogical reasoning, managers must distinguish between attribute and relational similarity (Gentner and Kurtz, 2006). Attribute similarity is direct similarity and is relatively easily recognizable and enables ready recognition of potentially useful applications (e.g., pharmacies providing the convenience of drive-through service much like fast food restaurants). Whereas such attribute similarity will enable managers to identify obvious elements of a source concept for borrowing into the target business model, the true power of analogical reasoning derives from similarity in relational structure, i.e., the extent to which the analog and the target share an underlying structure of the interrelationships among attributes. Analysis of the similarity of relational structures enables more systematic application of the analog (due to the so-called 'systematicity bias') (Gentner and Kurtz, 2006: 610), which should aid in the discovery of new activity systems (which are interrelationships of attributes) that can be borrowed to inform the activity system of the target business model schema.

Third, based on the comparison of the relational structures of the source concept and target business model schema, managers must determine what elements of the analog will be incorporated into the target concept. For example, based on its decision to compete on high-end design, Tesla incorporates several aspects of Apple's activity system. Like Apple, it unveils new models in lavish 'reveals' at invitation-only events at company headquarters rather than in large auto shows. In terms of their retail operations, an industry observer noted that, 'it's trying the Apple model of placing its own stores in high-end malls and shopping centers instead of relying on dealer franchises. Salespeople, who don't receive commissions, help buyers configure their cars on giant touchscreens' (Vance, 2013: 51). Also borrowing from Apple, the pricing strategy of Tesla 'is to enter at the high end of the market, where customers are prepared to pay a premium, and then drive down market as fast as possible to higher unit

volume and lower prices with each successive model' (Tesla Motors, 2006: 2). Similarly, Aravind Eye Care borrowed from the McDonald's business model the design of standardized processes, throughput metrics, and a wide network of outlets. Observers confirm the fidelity of the transfer. As Rosenberg, (2013: 1) a blogger for *The New York Times* noted, 'it is run like a McDonald's, with assembly-line efficiency, strict quality norms, brand recognition, standardization, consistency, ruthless cost control and above all, volume'. Also, the founder of Better Place highlighted the integration of the cellular phone service provider analogy as follows: '(i)n the same way that wireless operators deploy a network of cell towers to provide an area of mobile phone coverage, Project Better Place will establish a network of charging spots and battery exchange stations to provide ubiquitous access to electricity to power electric vehicles' (Paz, 2007: 17).

The success of this step of the development of a new business model using analogical reasoning depends on managers' ability to implement the design logic of the analog business model in the redesign of the target business model. The effectiveness with which managers execute this step depends on developing substantive understanding of the architecture of the analog's activity systems as well as of the strategic problems to be solved in the context of the target business model. For example, 'Dr. V spent a few days at McDonalds' Hamburger University in Oak Brook, Ill., but that visit was a product of his longstanding obsession with efficiency' (rather than an interest in McDonalds products) (Rosenberg, 2013: 2). In a different approach aimed at similar ends, Tesla hired former Apple executive George Blankenship to shape its retail operations.

Fourth, managers must determine how the elements borrowed from the analog need to be modified in order to fit the context of the target concept. For example, whereas the sales process of Tesla Motors strongly resembles that of Apple products, unlike the latter, the delivery of the product occurs much later. The modification is necessitated by the fact that stocking cars in high-end malls and shopping centers is economically impractical. Similarly, given that the key focus of efficiency in the case of Aravind Eye Care is maximizing the utilization of an eye surgeon's time rather than maximizing the utilization of equipment and low-skilled employees as in the case of McDonald's, they have modified the 'assembly-line'

process such that '(p)atients are prepared before surgery and bandaged afterwards by Aravind-trained nurses. The operating room has two tables. The doctor performs a surgery—perhaps 5 minutes—on Table 1, sterilizes her hands and turns to Table 2. Meanwhile, a new patient is prepped on Table 1' (Rosenberg, 2013: 2). In the case of Better Place, the key difference between its analog of cellular phone minutes and its target of electric miles is that while the former are delivered with no effort on the part of the consumer, the latter required drivers to change their batteries at swap stations, which Better Place installed at numerous locations (Squatriglia, 2007).

Just as important as the integration of the relevant aspects of the analog is the critical examination of which of its aspects do not transfer directly to the context of the target. For example, while the activity system of McDonald's provides guidelines for efficiently producing a standard product, it needed to be modified to fit with the eye surgery context of Aravind Eye Care in order to be applied successfully. Failing to take into account critical differences between the context of the analog and that of the target can lead to imperfect application of analogical reasoning. For example, one reason given for the demise of Better Place is that the effort involved in swapping batteries frequently (around every 100 miles) was unpalatable to buyers of electric cars, especially those using them for long drives (Rogowsky, 2013). Thus, while the analogy to cellular phone service providers was informative for the development of a network of charging systems, akin to cellular phone towers, by Better Place, it was ineffective for the business model as whole, as the comparison of cell phone minutes to electrical miles does not account for the structural difference in delivery of the consumable. While cell phone towers push minutes to the phone, requiring no effort from the user, obtaining electrical miles requires consumers to make frequent stops at battery-swapping stations.

To summarize, while analogical reasoning is an integral part of human thinking, in its natural use, it is driven by selective attention and the need to make sense of novel stimuli. Here we have proposed a systematic process rooted in attentional engagement, whereby analogical reasoning can be applied as a purposeful, strategic firm-level process for generating business model innovation. We emphasize that a defining characteristic of analogy-based business model innovation is the correct identification of similarities between an existing business model and

an analog concept and the appropriate transfer of attributes and relationships from the analog to inform the activity system of the target business model to address the innovating firm's strategic goals in a manner appropriate to its strategic context.

Business model innovation through conceptual combination

Like analogical reasoning, conceptual combination involves comparisons between two concepts. However, unlike analogical reasoning, its use rests on differences, rather than similarities, between a source and a target concept (Wisniewski, 1997a, 1997b). Thus, it has different generative potential from the generative potential of analogical reasoning. Whereas analogical reasoning has attracted growing attention in management research (Cornelissen and Clarke, 2010; Gavetti *et al.*, 2005), the cognitive process of conceptual combination has not been incorporated in strategic analysis. Yet, the process is considered central to understanding the generative and creative aspects of human thinking (Ward *et al.*, 1997) and the ideation of new products (Ward, 2004).

To apply conceptual combination to business model innovation, firms can also follow a four-step process. *First*, managers must select a modifier concept, which is a concept that can provide elements to be combined into the target concept. For example, Starbucks, which defines its stores as 'coffee bars,' selected a bar as the modifier concept to compare to the well-established business model of a café in the process of developing an innovative variant of a café (Schultz and Yang, 1999). Similarly, Guy Laliberte, the founder of Cirque du Soleil used elements from the concept for a theater production to modify aspects of the circus in the process of creating the new genre of 'contemporary circus.' As he noted in an interview at Google's Zeitgeist Europe conference in 2011, 'We didn't reinvent the circus. I think we just reshaped it . . . We took it and we worked creatively, very specifically with what the people of the theater were doing.' Starbucks and Cirque du Soleil developed innovative business models through purposeful selection of modifier concepts. In contrast, Best Buy's use of the concept of 'fire sale' as a modifier for its business model as a chain of high-end stereo stores (then called Sound of Music) was triggered by chance—the heavy damage of its flagship store in Roseville, Minnesota, by a tornado. According to media reports, founder Richard Schulze set up a big tent and trailer in a

fairground near the store and ‘filled both with damaged products and other excess stock, trundled in cash registers and portable toilets, and advertised a Tornado Sale, promising ‘best buys’ on everything’ (Gruley and McCracken, 2012: 73). Based on the success of the sale, Schulze and future CEO Brad Anderson ‘wondered if they could recreate the carnival-like atmosphere every day in a real store,’ setting in motion the process of creating the big box format of what is now Best Buy (Gruley and McCracken, 2012: 73).

A few aspects of this first step of business model innovation through conceptual combination must be noted. The discovery of a modifier concept can be intentional, as in the case of Starbucks and Cirque du Soleil, or accidental, as in the case of Best Buy. Regardless of how it occurs, the strategists have to recognize its potential utility to inform the current business model. For example, in the case of Starbucks, the conceptual combination of coffee retailer and a bar was not understood, even by its original founders who rejected Howard Schultz’s idea, refusing to enter ‘the restaurant business’ (Koehn, 2004). Furthermore, managers may select multiple modifier concepts to address different aspects of their business model. Thus, while Starbucks used the bar as the modifier of the concept of a coffee retailer to create the core of its business model, it also used the concept of gallery to inform the store design aspect of its business model (Schultz and Yang, 1999). Thus, unlike analogical reasoning, which provides whole activity systems that could be borrowed into the target business model and may not work effectively if too many of their elements are modified, conceptual combination allows for flexible combinations of elements borrowed from multiple modifiers.

Second, managers must compare the modifier concept to the target business model schema to identify differences that can be used as the bases for creating a new variant of the target business model. Recall that a slot is a dimension or aspect of the business model schema, and a filler is its typical value (Wisniewski, 1997b). The differences between the modifier and target concepts can be identified by comparing fillers in slots that are similar across the two concepts. For example, in comparing a bar to a coffee retailer, Starbucks identified differences in the slots for server (bartender in the case of a bar and cashier in the case of a coffee retailer), drinks (customizable mixed drinks in the case of a bar and standard coffee options in the case of a coffee

retailer), and interaction with customers (remembering names of regulars in the case of a bar versus knowledgeable but somewhat impersonal transactions in a coffee retailer). They used these in making changes to their existing business model as a specialty coffee retailer. In the case of Cirque du Soleil, managers identified differences between the theater and a circus along the slots for production theme (a coherent theme in the case of the theater versus a collection of unrelated acts in the case of a circus) and viewing environment (refined viewing environment of the theater versus the aisle concessions and in-seat beverage and food sales at a circus). For Best Buy, comparing a fire sale to a high-end retailer of sound systems helped managers identify differences in the slots for pricing (discounted pricing in a fire sale versus high-end pricing for a specialty retailer of sound systems), stocking (wide range of products at a fire sale versus a narrow range in a specialty store), and selling space (large space in the case of a fire sale versus a much smaller space for a specialty sound systems store) (Gruley and McCracken, 2012).

Whereas there is no general process for identifying relevant differences to be selected for integration or general understandings of how they are integrated, research suggests that individuals tend to select attributes that are highly prototypical for a given concept and that prototypical attributes are selected because their presence reliably identifies the entity as associated with the concept (Wisniewski, 1997a). Such attributes facilitate the transfer of meanings from the modifier into the new concept created through conceptual combination. The key to the effective execution of this step in the process of business model innovation through conceptual combination is accuracy in discerning the differences between the modifier concept and the target concept. Such an analysis requires a systematic exploration of the modifier concept. For example, after their tornado sale, Richard Schulze and Brad Anderson of Best Buy systematically explored the distinctive characteristics of such a sale (e.g., they explored various formats for large selling space) and compared them to the existing business model they used as retailers of high-end sound systems (Gruley and McCracken, 2012). It may also require a fresh look at the target business model to question the existing fillers in specific slots. For example, Howard Schultz describes how he began to question the prior business model of Starbucks when he visited Italy and observed their cafés. He notes that ‘The Italians

understood the personal relationship that people could have to coffee, its social aspect. I couldn't believe that Starbucks was in the coffee business, yet was overlooking so central an element of it' (Schultz and Yang, 1999: 52). Thus, through a process of studying the modifier and questioning the target business model, managers can discover important differences between the two that can serve as the basis for integrating new fillers from the modifier into the slots of the target business model schema.

Third, once the elements from the modifier concept that could inform the target business model schema have been identified, managers must integrate the selected values (fillers) of the modifier concept in the place of the corresponding existing fillers in slots of the target business model schema—a process that is termed 'slot filling' (Wisniewski, 1997b). For example, from the concept of a bar, Starbucks incorporated into their existing business model of a purveyor of coffee beans, fillers such as a bartender (called a 'barista'), who develops a personal relationship with customers (especially with regular ones), and a customizable menu of mixed drinks (Gulati, Huffman, and Neilson, 2002; Schultz and Yang, 1999). Similarly, from the concept of the theater, Cirque du Soleil integrated into the existing business model of a circus fillers such as a production theme, high-quality music, and theatricality in the performance of acrobatics which is achieved by training acrobats and ex-athletes in theatrical skills. Thus, '(u)nlike most circus acts which are a collection of unrelated variety acts, Cirque's shows have a narrative and plot set to rock or world music with the emphasis on athletic and acrobatic skills under the artistic direction of people whose background is in the theatre' (Morgan, 2007: 3). Best Buy replaced the fillers within its prior business model of a specialty sound systems store with fillers derived from a fire sale and, in the process, founder Richard Schulze created a superstore that was 'at least triple the size of any store he had and vowed to stock it not merely with stereos and TVs but also VCRs, dishwashers, camcorders, computers—just about anything that plugged into a wall—and sell it all at the lowest prices anywhere' (Gruley and McCracken, 2012: 73).

Because conceptual combination operates through 'slot filling,' it presents strategists with an option to focus on a specific dimension (slot) of an existing business model schema and search for possible modifiers from which values (fillers) can be integrated into the slot. This approach enables a more

efficient and focused generative process than the system-level comparison process required for the use of analogical reasoning. For example, in filling the slot for ambiance, Starbucks incorporated values from the schema for an office to attract professionals and to stimulate prolonged use by business people; from the schema for a gallery to 'aestheticize' the coffee and the coffee drinking experience; and from the schema for a specialty retail store to diversify its merchandise into a wide range of coffee-making and drinking accessories (Koehn, 2004; Schultz and Yang, 1999).

Fourth, managers must adapt the new filler(s) in the slots of their target business model schema to suit the characteristics of the target business model and its context. They also must attend to and capitalize on the new attributes that emerge from the combination that are distinct from those of either of the concepts being combined. For example, while Starbucks has incorporated the bar into the coffee retailer concept, there are no bar stools and customers do not chat with the barista while they are consuming coffee. Instead, the sociality of the bar is transferred to the entire space, converting a specialty coffee retailer into a social gathering place (which they explicitly refer to as 'a third place' between home and work). Cirque du Soleil also modified the fillers it derived from the theater to create replicable shows that can be performed by multiple groups of artists in multiple locations. Thus, rather than headlining its performers as is done in theatrical productions, Cirque hides its artists behind masks. However, while the masks and costumes hide the identity of the individual performer, they make the role strikingly beautiful, creating a new visual experience that does not exist in either the circus or theater.

The generative potential of conceptual combination focuses on the creation of new concepts that are variants of existing ones. As such, it is particularly effective for creating new dimensions of value in existing business models. However, the adaptation of new fillers derived from a modifier concept and used to replace prior ones in the target business model schema must be guided by an understanding of customer needs and a thorough examination of the strategy of the firm. In that sense, this step in the business model innovation process through conceptual combination is similar to that for business model innovation through analogical reasoning. However, unlike in the case of analogical reasoning, which is focused on borrowing system-level structures into

the target business model schema, conceptual combination can be based on incorporating one or more potentially unrelated elements from the modifier concept. As such, it allows for more creativity in changing products or customer experiences and creating new market categories. Furthermore, it generates new dimensions of value based on emergent attributes that cannot be derived directly and cannot be predicted, but can be noticed and cultivated as the conceptual combination is enacted in a new business model.

To summarize, while individuals can readily engage in conceptual combination to generate new ideas, the process has not been examined in detail for its generative potential within the strategy literature. Here we propose a four-step process through which the human capacity of conceptual combination can be deployed strategically through executive processing to generate new business models. We emphasize that a defining characteristic of business model innovation through conceptual combination is the strategic identification of differences between a modifier concept and the existing business model schema. These differences can be used to alter dimensions of existing business model schema by incorporating fillers from the modifier concept and adapting them to the context of the target business model, thereby creating novel value-enhancing variants.

DISCUSSION

Prior research has viewed business models as optimal activity systems that managers design to address their firms' interdependencies with strategic partners (Zott and Amit, 2010) and has emphasized their inertia in the absence of exogenous change. We contribute to theory on business model innovation by theorizing how business models can be proactively innovated in the absence of exogenous changes through processes of generative cognition. In keeping with recent developments within the cognitive perspective on strategy that have argued for a movement away from a focus on managerial cognition as constraints, we suggest how managers can proactively engage in systematic processes of schema change to innovate new business models. Drawing on cognitive psychology research on two major cognitive processes through which individuals change their schema to cope with novelty (analogical reasoning and conceptual combination), we theorize

firm-level strategic processes for designing innovative new business models. For each process, we articulate a four-step methodology specifying how managers can enact these processes effectively to ideate and design new business models in the absence of exogenous change.

The novel theoretical ideas about business model innovation we develop respond to the call by Zott and colleagues (2011) for further theory development on the mechanisms through which business model innovation takes place. Specifically, the cognitive processes we propose direct research on business model innovation toward a greater focus on the role managers play in the design of activity systems as reflections not only of rational calculation of interdependencies, but also of interpretive visions. A comparison of the three perspectives on business model innovation is summarized in Table 1.

Contributions to research

Our ideas contribute to two main areas of research in strategy and entrepreneurship: (1) research on business models and business model innovation; and (2) cognitive research in strategy. First, although our focus was on explaining conceptual innovation as a distinct, stand-alone business model innovation process, the ideas we articulated can inform business model innovation more generally. Second, structured cognitive processes of schema change are distinct causal mechanisms underlying business model innovation and strategic change. Our theory suggests that rather than viewing cognitive processes simply as mediating processes in the search for a rational design, they can form a part of the strategic toolkit that affects the dynamism and uniqueness of a firm's strategy. We elaborate on each of these contributions below.

Contribution to research on business models and business model innovation

The cognitive methodology we advance fills an important gap in the literature on business model innovation with regard to our understanding of how new business models are developed in the absence of exogenous change. As noted in our introduction, examples of such innovations abound. However, they are often attributed to 'entrepreneurial insight,' which is often assumed to arise from luck or 'epiphanies.' In contrast, our article identifies a set of structured processes firms can use to systematically

Table 1. Perspectives on business model innovation: rational positioning, evolutionary learning, and cognitive approaches

School of strategy	Definition of business models	Sources of change	Ideation	Design	Business model innovation outcome
Rational positioning	Optimal design of activity systems to manage key interdependencies	Exogenous shocks change interdependencies	Optimization based on rational economic analysis of exchange relationships	Redesign to reflect analysis of changed interdependencies	Repositioning for optimal fit with a given context and strategy
Evolutionary learning	Optimal design of activity systems to manage key interdependencies	Uncertainty due to exogenous changes	Unspecified entrepreneurial cognition and insight producing an initial hypothesis	Trial-and-error learning to reduce uncertainty	Evolving design adaptive to small changes
Cognitive	Cognitive structure organizing managerial understanding of interdependencies	Processes for schema change - Analogical reasoning - Conceptual combination	Use of concepts to transfer knowledge to reorganize or modify existing business model schema - Analogy-based knowledge transfer - Combination-based knowledge reorganization	Modification and integration of transferred knowledge to existing business model schema	A reconfigured business model incorporating a structure of activities and relationships that have been shown to have value-creating effects in a different context deemed to bear structural similarity with the one in which the innovated business model is introduced A variant of an existing model that incorporates substantively novel features that reinforce value-creating themes in the innovated business model

ideate and design new business models in the absence of exogenous change.

The processes we articulate provide a general framework for ideating new business models, which is a task that both existing and new firms face when they seek to commercialize new technologies (Chesbrough, 2010), to respond to competitive threats, or to pursue growth opportunities (Winter and Szulanski, 2001). Since established firms start with their existing business models, they are likely to encounter cognitive inertia that is difficult to overcome in the absence of exogenous changes (Doz and Kosonen, 2010; Sosna *et al.*, 2010). The strategic processes we outline can help them overcome this challenge, provided that these firms' strategists use attentional engagement to effect a cognitive search for conceptual resources. Both Best Buy and Starbucks were existing firms with established business models, but attended to the possibility of reinventing their business models through conceptual combination. New firms have greater latitude to apply the strategic processes of analogical reasoning and conceptual combination in designing their business models. However, their challenge is selecting the right analogies or modifier concepts to inform their target business models in the face of a host of uncertainties about their offerings and market demand. There is evidence that new firms are often prodded by advisors and investors to employ certain analogies, and their challenge is to recognize how the structural characteristics of these analogies impose a structure on their strategy. For example, the media analogy adopted by the early search engines led them to fundamentally transform their strategies and to limit their investment in search technologies (Rindova and Kotha, 2001). Our theory highlights for both existing and new firms that the choice of concepts for potential analogizing or conceptual combination is a strategic choice and that their application to a particular firm involves a strategic process. These ideas suggest that skillful use of these choices and processes can be an important source of performance differences among firms.

The controlled cognitive processes we draw attention to can also serve as a starting point for analyses and development of business models based on rational planning and evolutionary learning. For example, a new business model derived through analogical reasoning may then serve as the baseline model for evolutionary learning through experimentation. For example, Sosna and colleagues (2010) note that the baseline business model that was the starting point

for evolutionary learning in response to regulatory changes in the case example they examined arose in the cognition of the owner-manager. It could also be argued that Better Place might have avoided going under if it had used experimentation or rational positioning processes to fine-tune or position its business model to fit its context appropriately.

The conceptual innovation processes we specify can also be used as mechanisms for overcoming three causes of cognitive inertia that pose challenges to business model innovation identified by prior research: (1) complexity (Baden-Fuller and Morgan, 2010; Ward, 2004); (2) the need for integrity across design elements and design themes (Casadesus-Masanell and Ricart, 2010) resulting from the systemic structure of business models; and (3) the draw of familiarity and the inertial nature of business models (Chesbrough and Rosenbloom, 2002). Scholars have pointed to these sources of cognitive inertia as obstacles to business model innovation even in the presence of external technological change (Chesbrough, 2010). Researchers have observed that business model schemas are complex structural representations of the underlying activity systems and, as such, are difficult to ideate from scratch due to the challenges of working out at once all the attributes and interrelationships comprising a complex system (Baden-Fuller and Morgan, 2010; McGrath, 2010). The strategic processes we propose can help overcome this challenge since analogs and modifiers themselves are structured representations that capture interdependencies among attributes that can be used to inform a target business model. Analogs and modifiers are structured by design elements and design themes, thereby facilitating an assessment of both their value-creating effects in their current context and their compatibility with those of the target business model. As a result, the strategic processes we propose provide managers with better opportunities to consider the design elements and themes of a new business model than they would have if they were to develop it *de novo*. Researchers have also identified the tendency of managers to seek familiarity in business models (Chesbrough and Rosenbloom, 2002) and the challenges they face when confronted with unfamiliar concepts (Ward *et al.*, 1997). Since analogical reasoning and conceptual combination essentially are based on comparing a familiar source concept to a familiar target concept, these mechanisms may be more readily utilized by managers to generate new business models.

Contribution to cognitive strategy research

Our theoretical ideas build on the growing body of strategy research that focuses on the importance of managerial cognitions and representations for understanding firm strategies. This research has offered a distinct explanation of strategy making and strategic change by focusing on the idiosyncratic managerial representations that generate heterogeneity in strategies and environmental enactment (Gavetti *et al.*, 2007; Kaplan, 2011; Rajagopalan and Spreitzer, 1997). However, as Porac and Tschang (2013: 251) lamented, an emphasis on ‘small-brained management theory has skewed scholarly attention away from the accomplishments of managers as imaginative architects and system designers.’ These authors highlight the importance of studying what enables managers to imagine new possibilities based on open-ended exploration of problem spaces and new knowledge creation.

Our theory takes a step in this direction by articulating how naturally occurring processes of generative cognition can become a part of a firm’s strategic methodology for innovation and change. It explains how managers can overcome the known constraints of human cognition. Specifically, it proposes how managers can combine their schemas with knowledge available outside their firms and even industries to reorganize their schemas and ideate new business models. As such, it advances understanding of strategists as creative knowledge generators with the potential to disrupt industries with imaginative new business models, rather than as reactive problem solvers.

Conclusion

Business models are clearly recognized as a distinct strategic construct that explains the logic for a firm’s value creation and capture. Yet, current research presents a limited perspective on how firms develop novel business models, as it portrays them as responses to exogenous technological and regulatory change. We built on the nascent cognitive perspective on business models to emphasize that business models reflect conscious managerial choice and strategic design. We propose how business models can be innovated through systematic use of generative cognitive processes that require attention to, and skillful use of, concepts. Therefore, our theory highlights how managerial thinking and interpretive work can unlock hidden value in concepts to

generate business model innovation and uncover novel sources of value creation.

REFERENCES

- Afuah A, Tucci CL. 2001. *Internet Business Models and Strategies: Text and Cases*. McGraw-Hill: New York.
- Amit R, Zott C. 2001. Value creation in e-business. *Strategic Management Journal* **22**(6/7): 493–520.
- Baden-Fuller C, Morgan MS. 2010. Business models as models. *Long Range Planning* **43**(2/3): 156–171.
- Barr PS, Stimpert JL, Huff AS. 1992. Cognitive change, strategic action, and organizational renewal. *Strategic Management Journal* **13**(5): 15–36.
- Bask A, Merisalo-Rantanen H, Tinnilä M, Lauraeus T. 2012. Evolution of banking service providers in Finland. In *The Future of Banking Services*, Aspara J, Rajala R, Tuunainen VK (eds). Aalto University Press: Helsinki, Finland; 51–69.
- Björkdahl J. 2009. Technology cross-fertilization and the business model: the case of integrating ICTs in mechanical engineering products. *Research Policy* **38**(9): 1468–1477.
- Casadesus-Masanell R, Ricart JE. 2010. From strategy to business models and onto tactics. *Long Range Planning* **43**(2/3): 195–215.
- Chesbrough H. 2010. Business model innovation: opportunities and barriers. *Long Range Planning* **43**(2): 354–363.
- Chesbrough H, Rosenbloom RS. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation’s technology spin-off companies. *Industrial and Corporate Change* **11**(3): 529–555.
- Christensen CM, Rosenbloom RS. 1995. Explaining the attacker’s advantage: technological paradigms, organizational dynamics, and the value network. *Research Policy* **24**(2): 233–257.
- Cornelissen JP, Clarke JS. 2010. Imagining and rationalizing opportunities: inductive reasoning and the creation and justification of new ventures. *Academy of Management Review* **35**(4): 539–557.
- Demil B, Lecocq X. 2010. Business model evolution: in search of dynamic consistency. *Long Range Planning* **43**(2/3): 227–246.
- DiMaggio P. 1997. Culture and cognition. *Annual Review of Sociology* **23**: 263–287.
- Doz YL, Kosonen M. 2010. Embedding strategic agility: a leadership agenda for accelerating business model renewal. *Long Range Planning* **43**(2): 370–382.
- Dubosson-Torbay M, Osterwalder A, Pigneur Y. 2002. E-business model design, classification, and measurements. *Thunderbird International Business Review* **44**(1): 5–23.
- Fiske ST, Taylor SE. 1991. *Social Cognition*. McGraw-Hill: New York.

- Gavetti G, Levinthal D. 2000. Looking forward and looking backward: cognitive and experiential search. *Administrative Science Quarterly* **45**(1): 113–137.
- Gavetti G, Levinthal D, Ocasio W. 2007. Neo-Carnegie: the Carnegie School's past, present, and reconstructing for the future. *Organization Science* **18**(3): 523–536.
- Gavetti G, Levinthal DA, Rivkin JW. 2005. Strategy making in novel and complex worlds: the power of analogy. *Strategic Management Journal* **26**(8): 691–712.
- Gavetti G, Rivkin JW. 2007. On the origin of strategy: action and cognition over time. *Organization Science* **18**(3): 420–439.
- Gentner D. 1983. Structure-mapping: a theoretical framework for analogy. *Cognitive Science* **7**(2): 155–170.
- Gentner D, Holyoak KJ, Kokinov BK. 2001. *The Analogical Mind: Perspectives from Cognitive Science*. MIT Press: Cambridge, MA.
- Gentner D, Kurtz KJ. 2006. Relations, objects, and the composition of analogies. *Cognitive Science* **30**(4): 609–642.
- George G, Bock AJ. 2011. The business model in practice and its implications for entrepreneurship research. *Entrepreneurship Theory and Practice* **35**(1): 83–111.
- Gioia DA. 1986. Conclusion: the state of the art in organizational social cognition. In *The Thinking Organization*, Gioia DA, Sims HP, Associates (eds). Jossey-Bass: San Francisco, CA; 336–357.
- Gruley B, McCracken J. 2012. Best Guy? *Bloomberg Businessweek*, 22 October: 70–75.
- Gulati R, Huffman S, Neilson G. 2002. The barista principle: Starbucks and the rise of relational capital. *Strategy + Business*, August. Available at: <http://www.strategy-business.com/article/20534?gko=582b3> (accessed 11 January 2015).
- Gureckis TM, Goldstone RL. 2010. Schema. In *The Cambridge Encyclopedia of the Language Sciences*, Hogan PC (ed). Cambridge University Press: Cambridge, U.K.; 725–727.
- Hansen MT, Birkinshaw J. 2007. The innovation value chain. *Harvard Business Review* **85**(6): 121–133.
- Hargadon AB, Douglas Y. 2001. When innovations meet institutions: Edison and the design of the electric light. *Administrative Science Quarterly* **46**(3): 476–501.
- Hastie R. 1991. A review from a high place: the field of judgment and decision making as revealed in its current textbooks. *Psychological Science* **2**(3): 135–138.
- Holloway SS, Sebastiao HJ. 2010. The role of business model innovation in the emergence of markets: a missing dimension of entrepreneurial strategy? *Journal of Strategic Innovation and Sustainability* **6**(4): 86–101.
- Holyoak KJ, Thagard P. 1995. *Mental Leaps: Analogy in Creative Thought*. MIT Press: Cambridge, MA.
- Johnson MW. 2010. *Seizing the White Space: Business Model Innovation for Growth and Renewal*. Harvard Business School Press: Boston, MA.
- Kaplan S. 2011. Research in cognition and strategy: reflections on two decades of progress and a look to the future. *Journal of Management Studies* **48**(3): 665–695.
- Koehn NF. 2004. Howard Schultz and Starbucks coffee company. Harvard Business School Case 801-361, Harvard University, Boston, MA.
- Kunzler G. 2013. Elon Musk: the Tesla S is the 'Macintosh' of Automobiles. Available at: <http://www.mactrast.com/2013/02/elon-musk-the-tesla-model-s-is-the-macintosh-of-automobiles/> (accessed 11 January 2015).
- Markides CC. 2008. *Game-Changing Strategies: How to Create New Market Space in Established Industries by Breaking the Rules*. Jossey-Bass: San Francisco, CA.
- McGrath RG. 2010. Business models: a discovery driven approach. *Long Range Planning* **43**(2/3): 247–261.
- Mehta P, Shenoy S. 2011. *Infinite Vision: How Aravind Became the World's Greatest Business Case for Compassion*. Berrett-Koehler Publishers: San Francisco, CA.
- Morgan K. 2007. Guy Laliberte: billionaire head of the world's fastest-growing circus. *Billionaire Magazine*. Available at: http://www.islandconnections.com/edit/guy_laliberte.htm (accessed 19 January 2014).
- Murphy GL. 1988. Comprehending complex concepts. *Cognitive Science* **12**(4): 529–562.
- Narayanan VK, Zane LJ, Kemmerer B. 2011. The cognitive perspective in strategy: an integrative review. *Journal of Management* **37**(1): 305–351.
- Ocasio W. 2011. Attention to attention. *Organization Science* **22**(5): 1286–1296.
- Ocasio W, Joseph J. 2008. Rise and fall—or transformation? The evolution of strategic planning at the General Electric Company, 1940–2006. *Long Range Planning* **41**(3): 248–272.
- Parasuraman R. 2000. *The Attentive Brain*. MIT Press: Cambridge, MA.
- Paz S. 2007. Agassi, Ofer launch \$200m. electric car project. *Jerusalem Post*, 30 October: 17.
- Porac J, Thomas H. 1994. Cognitive categorization and subjective rivalry among retailers in a small city. *Journal of Applied Psychology* **79**: 54–66.
- Porac J, Tschang FT. 2013. Unbounding the managerial mind: it's time to abandon the image of managers as 'small brains.' *Journal of Management Inquiry* **22**(2): 250–254.
- Rajagopalan N, Spreitzer GM. 1997. Toward a theory of strategic change: a multi-lens perspective and integrative framework. *Academy of Management Review* **22**(1): 48–79.
- Rangan VK. 1993. Aravind Eye Hospital, Maduai, India: in service for sight. Harvard Business School Case 593-098, Harvard University, Boston, MA.
- Rindova VP, Kotha S. 2001. Continuous 'morphing': competing through dynamic capabilities, form, and function. *Academy of Management Journal* **44**(6): 1263–1280.
- Rindova VP, Petkova A. 2007. When is a new thing a good thing? Technological change, product form design, and

- perceptions of value for product innovations. *Organization Science* **18**(2): 217–232.
- Rogowsky M. 2013. 6 reasons Tesla's battery swapping could take it to a 'Better Place.' Available at: <http://www.forbes.com/sites/markrogowsky/2013/06/21/6-reasons-teslas-battery-swapping-could-take-it-to-a-better-place/> (accessed 19 January 2015).
- Rosenberg T. 2013. A hospital network with a vision. *The New York Times*, 16 January. Available at: http://opinionator.blogs.nytimes.com/2013/01/16/in-india-leading-a-hospital-franchise-with-vision/?_r=0 (accessed 19 January 2015).
- Schultz H, Yang DJ. 1999. *Pour Your Heart into It: How Starbucks Built a Company One Cup at a Time*. Hyperion: New York.
- Shafer SM, Smith HJ, Linder JC. 2005. The power of business models. *Business Horizons* **48**(3): 199–207.
- Siggelkow N. 2002. Evolution toward fit. *Administrative Science Quarterly* **47**(1): 125–159.
- Sosna M, Treviño-Rodríguez RN, Velamuri SR. 2010. Business model innovation through trial-and-error learning: the Naturhouse case. *Long Range Planning* **43**(2): 383–407.
- Squatriglia C. 2007. Shai Agassi wants to sell electric cars like cell phones. Available at: <http://www.wired.com/2007/10/selling-electri/> (accessed 11 January 2015).
- Suarez FF, Cusumano MA, Kahl SJ. 2013. Services and the business models of product firms: an empirical analysis of the software industry. *Management Science* **59**(2): 420–435.
- Teece DJ. 2010. Business models, business strategy and innovation. *Long Range Planning* **43**(2/3): 172–194.
- Tesla Motors. 2006. The secret Tesla Motors master plan. Available at: <http://www.teslamotors.com/blog/secret-tesla-motors-master-plan-just-between-you-and-me> (accessed 15 January 2013).
- Thompson JD. 1967. *Organizations in Action*. McGraw-Hill: New York.
- Timmers P. 1998. Business models for electronic markets. *Electronic Markets* **8**(2): 3–8.
- Vance A. 2013. Electronic company. *Bloomberg Businessweek*, 22 July: 48–52.
- Visnjic Kastalli I, Van Looy B. 2013. Servitization: disentangling the impact of service business model innovation on manufacturing firm performance. *Journal of Operations Management* **31**(4): 169–180.
- Walsh JP. 1995. Managerial and organizational cognition: notes from a trip down memory lane. *Organization Science* **6**(3): 280–321.
- Ward TB. 2004. Cognition, creativity, and entrepreneurship. *Journal of Business Venturing* **19**(2): 173–188.
- Ward TB, Smith SM, Vaid J. 1997. Conceptual structures and processes in creative thought. In *Creative Thought: An Investigation of Conceptual Structures and Processes*, Ward TB, Smith SM, Vaid J (eds). American Psychological Association: Washington, D.C.; 1–27.
- Winter SG, Szulanski G. 2001. Replication as strategy. *Organization Science* **12**(6): 730–743.
- Wisniewski EJ. 1996. Construal and similarity in conceptual combination. *Journal of Memory and Language* **35**(3): 434–453.
- Wisniewski EJ. 1997a. When concepts combine. *Psychonomic Bulletin & Review* **4**(2): 167–183.
- Wisniewski EJ. 1997b. Conceptual combination: possibilities and esthetics. In *Creative Thought: An Investigation of Conceptual Structures and Processes*, Gentner D, Brem S, Ferguson R, Wolff P (eds). American Psychological Association: Washington, D.C.; 51–81.
- Zott C, Amit R. 2007. Business model design and the performance of entrepreneurial firms. *Organization Science* **18**(2): 181–199.
- Zott C, Amit R. 2010. Business model design: an activity system perspective. *Long Range Planning* **43**(2): 216–226.
- Zott C, Amit R, Massa L. 2011. The business model: recent developments and future research. *Journal of Management* **37**(4): 1019–1042.