

Perspective

Data-Driven Business Model Innovation

Alina Sorescu

In recent times, more successful startups, such as Airbnb or Uber, have been spurred by business model innovation than by product innovation. I tap into the growing stream of research on business models from the strategy literature to propose ways in which companies can leverage information networks and big data to innovate their current business models or to develop new ones. I provide examples on how companies can leverage internal and external data to generate new business models and I propose a few research questions that can help academics and practitioners understand the link between big data and business model innovation.

Practitioner Points

- Business model innovation does not have to be designed around product innovation, nor does it have to be disruptive: it simply needs to generate a change in the value creation, value appropriation, or value delivery function of a firm that would result in a significant improvement in the firm's value proposition.
- Business model innovations can be designed around a process of collecting, organizing, and summarizing external data, with the goal of simplifying the market research process and increasing the probability of identifying an unmet consumer need.
- Business model innovations can be designed around a process of collecting, organizing, and summarizing internal data, with the goal of improving product assortment, product recommendations, and promotional efforts.

Amazon. Google. Facebook. Netflix. None of these companies have reached billions in dollars in market capitalization through product innovation alone. Instead, they have disrupted their markets, or created new ones by using an innovative business model. Practitioners agree that business model innovation can be a formidable source of competitive advantage, if done right (e.g., Pohle and Chapman, 2006). Strategy researchers have written hundreds

of articles on this topic, and have significantly advanced our understanding of business models (Wirtz, Pistoia, Ullrich, and Göttel, 2016; Zott, Amit, and Massa, 2011). Yet marketing thought is generally absent from this research stream, despite the fact that business models ultimately spell out how firms deliver value to their customers. Furthermore, there is little agreement on what a business model is, or on the factors that drive the success of business model innovations.

Reconciling the many different perspectives that emerge from the strategy literature is beyond the scope of this short essay. Instead, I draw from this literature to define business model innovation and to describe it in relation to the more common types of innovation featured in the marketing literature. Given the theme of this special issue I focus on one specific factor that has both enabled business model innovations and has strengthened their competitive advantage in the marketplace: big data.

Business Model: Definition and Relevance to Marketing

In 2002, Magretta defined business models as “stories that explain how enterprises work.” More precise and increasingly complex definitions have followed, attempting to describe the general structure and the components of business models while looking for ways to succinctly summarize how firms do business. Table 1 presents a short selection of some of the definitions that have been advanced in this research stream.

Most of these definitions suggest that a business model articulates how a firm creates value for their

Address correspondence to: Alina Sorescu, Professor of Marketing, Paula and Steve Letbetter '70 Chair in Business, Mays Business School, Texas A&M University, College Station, Texas 77843-4112. E-mail: asorescu@tamu.edu. Tel: 979-862-3043.

customers and how it appropriates this value. The value proposition—a quintessential marketing concept—is included as an integral element of the business model in several of these definitions. Furthermore, several other elements have deep roots into the marketing literature. For instance, research in product design can inform the value creation function of a business model. Research in pricing, promotion, advertising, product placement, and customer satisfaction are critical to the understanding of the value delivery function. Finally, research in product innovation can yield insights into the potential adoption and diffusion of business model innovations.

Business Model Innovation and Its Relation to Product and Process Innovation

How can a company innovate their business model? Do they need to first develop a radical innovation? A technological breakthrough? Does the technology have to be disruptive? More generally, how does business model innovation relate to the types of innovation more commonly studied in marketing, such as radical and disruptive (e.g., Chandy and Tellis, 1998; Sood and Tellis, 2011)?

The definitions of business model presented in Table 1 can provide answers to these questions. There are three building blocks that are implicit in most of these definitions: value creation, value delivery, and value appropriation. Value creation refers to the resources and processes that underlie the development and manufacturing of a firm's product and services. Value delivery focuses on these products and services, as well as on the environment in which they are sold. Value appropriation refers to firms' cost and revenue functions.

BIOGRAPHICAL SKETCHES

Dr. Alina Sorescu is professor of marketing and holder of the Paula and Steve Letbetter '70 Chair in Business at the Mays Business School, Texas A&M University. Her research focuses on business models, product portfolio decisions, branding, acquisitions and alliances, and measuring the financial value of marketing actions. She has published articles in *Marketing Science*, *Journal of Marketing Research*, *Journal of Marketing*, *Journal of the Academy of Marketing Science*, *Journal of Retailing* and others. Alina serves on the editorial board of the *Journal of Marketing*, where she was twice recognized with the best reviewer award, the *Journal of Marketing Research*, *Marketing Science* and the *Journal of the Academy of Marketing Science*. Her research has also been selected as a finalist for the Paul Green Award for the best article published in the *Journal of Marketing Research*.

A *business model innovation* is defined as a change in the value creation, value appropriation, or value delivery function of a firm that results in a significant change to the firm's value proposition. Product and process innovation can occur in one or more of these three blocks without necessarily impacting the overall value proposition of the firm. Product innovation typically originates in the value creation block of a business model and in many firms is a recurring and expected activity needed to refresh the product assortment component of value delivery. Process innovation typically consists in a change in either value creation or value appropriation, but may not necessarily benefit consumers. An example of process innovation is a supply chain change that makes the channel more efficient, but the efficiency gains are appropriated by the firm and no transfer is made to consumers. In contrast, Zara's design of an expeditious supply chain that produces a new line in 2 to 4 weeks does have a significant impact on the value received by customers (Girotra and Netessine, 2011). Zara's fast fashion business model is enabled by the variety and velocity of their big data systems: real-time analysis of trending fashion data from third-party vendors and customer spending data from their stores allows Zara to provide an ever changing assortment of on-trend clothing, while maintaining a low inventory.

Is Business Model Innovation Always Fueled by a New Product?

Not necessarily, as Zara's example shows. A business model innovation can simply reinvent the delivery or the consumption of a product that has long been available. Case in point is Redbox, which afforded consumers with cheaper and more convenient access to movies. Redbox was later displaced by Netflix, which further enhanced the home movie viewing experience by broadening both accessibility and assortment.

If the Business Model Innovation Is Fueled by a New Product, Does it Have to Be a Technological Breakthrough or a Radical Innovation?

Not necessarily. Take Blue Apron, Hello Fresh, or Plated, delivery services that send boxes of precisely measured ingredients to consumers who wish to home cook their meals but do not have the time to assemble these ingredients on their own. The delivery of this product is made possible by software applications and

Table 1. Representative Definitions of Business Models

Article	Definition of a Business Model	Components of the Business Model
Chesbrough and Rosenbloom (2002)	A business model represents “The heuristic logic that connects technical potential with the realization of economic value” (p. 529).	The functions of a business model are to: (1) articulate the value proposition; (2) identify a market segment; (3) define the structure of the value chain within the firm required to create and distribute the offering, and determine the complementary assets needed to support the firm’s position in this chain; (4) estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen; (5) describe the position of the firm within the value network linking suppliers and customers; (6) formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals.
Magretta (2002)	Business models are “stories that explain how enterprises work. A good business model answers Peter Drucker’s age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?” (p. 4).	Not clearly articulated, but the author states that a powerful business model passes two tests: the narrative test (telling a logical story that explains who the customers are, what they value, and how the firm will make money providing them with that value) and a numbers test (the assumptions about customers have to be tied to sound economics so that the company would generate profits).
Morris, Schindehutte, and Allen (2005)	A business model is a “concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets” (p. 727).	(1) Value proposition, (2) market factors, (3) internal capability factors, (4) competitive strategy factors, (5) economic factors, (6) personal/investor factors
Johnson, Christensen, and Kagerman (2008)	Business models “consist of four interlocking elements, that, taken together, create and deliver value” (p. 52).	(1) Customer value proposition, (2) profit formula, (3) key resources and processes
Zott and Amit (2010)	A business model is “a system of interdependent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value” (p. 216).	(1) Activity system content, (2) structure, and (3) governance
Demil and Lecocq (2010)	“The description of the articulation between different BM components or ‘building blocks’ to produce a proposition that can generate value for consumers and thus for the organization.” (p. 43)	(1) Resources and competences, (2) organizational structure, (3) value proposition
Teece (2010)	“A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value.” (p. 173)	(1) Select technologies and features to be embedded in the product/service (2) Determine benefit to the customer from consuming/using the product/service (3) Identify market segments to be targeted (4) Confirm available revenue streams (5) Design mechanisms to capture value
Casadesus-Masanell and Ricart (2010)	“Business Model refers to the logic of the firm, the way it operates and how it creates value for its stakeholders.” (p. 196)	(1) The concrete choices made by management about how the organization must operate, and (2) the consequences of these choices.
Osterwalder and Pigneur (2010)	“A business model describes the rationale of how an organization creates, delivers, and captures value.”	(1) Customer segments, (2) value propositions, (3) channels, (4) customer relationships, (5) revenue streams, (6) key resources, (7) key activities, (8) key partnerships, (9) cost structure
Sorescu, Frambach, Singh, Rangaswamy, and Bridges (2011)	“A business model is a well-specified system of interdependent structures, activities, and processes that serves as a firm’s organizing logic for value creation (for its customers) and value appropriation (for itself and its partners).” (p. S5)	In a retailing context, a business model has three interconnected core elements: retailing format, activities, and governance, which together with their interdependencies define a retailer’s organizing logic for value creation and appropriation.

Web—and mobile—technologies that can mine high volume and high variety supplier and consumer trend big data to obtain a just-in-time supply of ingredients for fresh and relatively healthy meals (Simon and Kolodny, 2014). However, the end product has no technological component; rather, it is simply a novel and streamlined solution for getting dinner on the table.

At the same time, an appropriate business model underlies every successful radical innovation. While Xerox invented the first photocopy machine, it had difficulty selling such an expensive product. Xerox had to change their business model to one that allowed firms to lease the machines in order to facilitate their adoption (Chesbrough and Rosenbloom, 2002). But Xerox is also infamous for failing to commercialize the world's first computer, which did not fit a business model designed for producing and selling copiers (Smith and Alexander, 1999).

Does a Business Model Innovation Need to Be Disruptive?

Netflix has sent Blockbuster to the dustbin of history. Uber's competitive threat to commercial taxi drivers has been significant enough to cause social unrest (Rubin and Scott, 2015). But sometimes business model innovations coexist with incumbent alternatives. The global crowdfunding platform Kickstarter has not driven venture capital out of business. Build-a-Bear, a store where children can design and build their own stuffed animals has not replaced traditional toy stores. Business model innovations need not always be disruptive, they simply need to provide, on some level, significantly higher benefits than these offered by incumbents.

In sum, business models can play two complementary roles in fostering innovation. First, they can provide the appropriate architecture to design and commercialize new ideas and technologies. Second, they can be a source of innovations in themselves, a new value-added way to selling existing products or services (Massa and Tucci, 2013).

Building Business Models Around Big Data

Big data can be a source of competitive advantage and a catalyst for successful business models: the 2014 IBM innovation survey found that “organizations using big data and analytics within their innovation processes are 36% more likely to beat their competitors in terms

of revenue growth and operating efficiency” (Marshall, Mueck, and Shockley, 2015). The three characteristics of big data—volume, velocity, and variety—can be noted as sources of competitive advantage in several new business models. For instance, Olery Reputation monitors over 100 websites where consumers in the hospitality industry can leave reviews. Its business model is designed to identify, collect, and analyze high-volume data from a large variety of sources that collect guest reviews, in order to provide executives in this industry—in a highly expeditious manner—with inputs in the forms of summaries and trends that can help them understand their customer base and react to feedback in a timely manner. I present below a few ways in which companies can innovate their business model by utilizing big data.¹

Leveraging External Data

Today's marketplace is full of data consumers, ranging from individuals and firms to local and national governments. To satisfy the needs of these consumers, firms have built business models that retrieve, package, and sell relevant external data. Consider Gnip, a social media API aggregation company that gathered data from specific providers (e.g., Twitter, Digg, or Vimeo) and instantly sent it to consumers. Purchased by Twitter in 2014, Gnip illustrates how a value proposition can be built on getting the right data to the right customers, in real time, and in a user friendly format: “TechCrunch just tweeted – here's the data” (Arrington, 2008). Gnip's business model successfully leveraged all three main characteristics of big data: their technology was able to sort through high variety, big volume data in real time, and extract only the portion that was of value to consumers.

Leveraging Internal Data

Two cases can be distinguished. First, firms can tap into data generated by consumers, in order to serve them better and also to create revenues for the firm. For instance, product recommendations on Amazon.com are based on a sophisticated analysis of the browsing and purchase data of its customers. One of the pillars of the value delivery function of Amazon.com, the efficient manner in which consumers can form consideration sets and retrieve preferred products on the firm's website, is

¹SAS defines big data as “large volume of data—both structured and unstructured—that inundates a business on a day-to-day basis” (http://www.sas.com/en_us/insights/big-data/what-is-big-data.html)

enabled by Amazon's capability to sort through a high volume, high variety assortment data. This approach is not unique to web-based companies. FitBit's fitness tracking devices would not amount to much without FitBit's ability to collect, aggregate, and turn their users' data into consumable information (Lokitz, 2015).

At the other end of the spectrum lie firms that accumulate vast amounts of data from many sources, but do not have the expertise to utilize the data for profit. Examples of companies that have built business models that can help firms fulfill this need range from behemoths like Microsoft and SAP, who switched from mainly selling software licenses to providing data-based services to newer players such as Salesforce and Amazon Web Services. These companies are building infrastructure that supports cloud software and analytics, and are changing their business models to provide enterprise applications, that is, software platforms that turn data into answers and assist firms in solving enterprise problems (Lansiti and Lakhani, 2014). The challenges of harnessing insights from big data are turning former hardware and software manufacturers like Microsoft and IBM into big data analytics service providers.

From Microanalytics to Macroanalytics

The examples presented above illustrate how business model innovations can help consumers or firms handle and intelligently use significant amounts of data. Another opportunity for business model innovation lies in utilizing the intrinsic variety of big data relevant to each context, such as in taking consumer-level data, combining it with data from other sources, and creating intelligence that can assist policy makers. For instance, hospitals are increasingly building patient profiles that combine vitals and care history with external data such as diet scores from MyFoodDiary or exercise scores from FitBit. This data can be used at a micro level to predict patient outcomes and provide better care. But the same data can be further combined to produce insights at a macro level. Assume a health organization needs to make available a vaccine that is in short supply: what is the best way to deploy it? Individual patient data could be aggregated to the general population level in order to help the health organization make a more informed decision (Schmarzo, 2015).

The changing infrastructure around the world is yet another area that generates massive amounts of data which require significant changes in existing business models. The smart grid—an electrical grid that includes

smart meters, smart appliances, renewable energy resources, and energy efficiency resources—is forcing utilities to reinvent their business models to accommodate the large amounts of data that the smart grid generates. Electric utility companies must now add a digital layer to their infrastructure and must implement changes to their business models that allow them to capitalize on investments in smart technology. While analysts predict that big data analytics and forecasting software will become the cornerstone of business in utilities, players in this industry have no expertise in this domain, nor do they own the entire smart grid. This creates opportunities for IT companies that are able to collect this data, some of which is generated by the company's customers, some external and turn it into business intelligence for utility companies (Frost and Sullivan, 2013).

Conclusion and a Few Research Directions

Henry Chesbrough noted that “Business models matter. A better business model often will beat a better idea or technology” (2007, p. 12). The lack of marketing research on the determinants, components, and consequences of business model innovation is surprising. As the examples in this article show, big data offers many opportunities to update business models and create new ones. However, academic research is yet to provide any guidance in this area.

In stark contrast to the nature of big data, the availability of data on the success of business models fueled by big data is scarce. Perhaps the first approach to study this topic should be qualitative or conceptual, in an attempt to provide structure for future empirical studies. Interesting research questions abound in this domain. For instance, should firms exploit big data to simply supercharge their CRM processes, or should they seek to harness it to completely transform the value creation or value delivery components of the business model as Zara did with their supply chain? Can firms channel big data to better serve niche segments without cannibalizing their own products or weakening brand associations? If big data enables firms to offer a new product or service, should they spin it off as an independent division or incorporate it into their current business model? Is business model innovation a stronger source of competitive advantage than product innovation? If so, can big data strengthen this competitive advantage by offering real-time insights on how to update the business model to effectively respond to changes in market conditions?

Marketing academics are in the best position to build theoretical insights and offer prescriptive implications on how firms can use big data to craft unique value propositions and how they can ensure that their underlying premise materializes in a positive customer experience. I hope that the marketing discipline will fill this important gap soon.

REFERENCES

- Arrington, M. 2008. Gnip 2.0 launches, with a business model. Available at: <http://techcrunch.com/2008/09/30/gnip-20-launches-with-a-business-model/>
- Casadesus-Masanell, R., and J. E. Ricart. 2010. From strategy to business models and onto tactics. *Long Range Planning* 43: 195–215.
- Chandy, R. K., and G. J. Tellis. 1998. Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of Marketing Research* 35: 474–87.
- Chesbrough, H. 2007. Business model innovation: It's not just about technology anymore. *Strategy & Leadership* 35: 12–17.
- Chesbrough, H., and R. S. Rosenbloom. 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: 529–55.
- Demil, B., and X. Lecocq. 2010. Business model evolution: In search of dynamic consistency. *Long Range Planning* 43: 227–46.
- Frost and Sullivan. 2013. Big data drives business model transformation in utilities. Available at: <http://www.frost.com.ezproxy.library.tamu.edu/prod/servlet/report-brochure.pag?id=M9EA-01-00-00-00>
- Girotra, K., and S. Netessine. 2011. How to build risk into your business model. *Harvard Business Review* 89: 100–5.
- Lansiti, M., and K. Lakhani. 2014. Digital ubiquity: How connections, sensors, and data are revolutionizing business. *Harvard Business Review* 92: 90–99.
- Johnson, M. W., C. M. Christensen, and H. Kagermann. 2008. Reinventing your business model. *Harvard Business Review* 86: 57–68.
- Lokitz, J. 2015. Exploring big data business models & the winning value propositions behind them. Available at: <http://www.business-modelsinc.us/blog/#sthash.1MPfCodW.dpuf>
- Magretta, J. 2002. Why business models matter. *Harvard Business Review* 780: 86–92.
- Marshall, A., S. Mueck, and R. Shockley. 2015. How leading organizations use big data and analytics to innovate. *Strategy & Leadership* 43: 32–39.
- Massa, L., and C. L. Tucci. 2013. *Business model innovation. The Oxford handbook of innovation management*. Oxford: Oxford University Press.
- Morris, M., M. Schindehutte, and J. Allen. 2005. The entrepreneur's business model: Toward a unified perspective. *Journal of Business Research* 58: 726–35.
- Osterwalder, A., and Y. Pigneur. 2010. *Business model generation: A handbook for visionaries, game changers, and challengers*. Hoboken, NJ: John Wiley & Sons.
- Pohle, G., and M. Chapman. 2006. IBM's global CEO report 2006: Business model innovation matters. *Strategy & Leadership* 34: 34–40.
- Rubin, A. J., and M. Scott. 2015. Clashes erupt across France as taxi drivers protest Uber. *The New York Times*. June 25. Available at: http://www.nytimes.com/2015/06/26/business/international/uber-protests-france.html?_r=0
- Schmarzo, B. 2015. The challenge of macro analytics economics. Available at: https://infocus.emc.com/william_schmarzo/the-challenge-of-macro-analytics-economics/
- Simon, R., and L. Kolodny. 2014. Planning a meal around data—Meal-delivery startups Plated, Blue Apron use data to focus on the orders. *Wall Street Journal*, July 24.
- Smith, D. K., and R. C. Alexander. 1999. *Fumbling the future: How Xerox invented, then ignored, the first personal computer*. iUniverse.
- Sood, A., and G. J. Tellis. 2011. Demystifying disruption: A new model for understanding and predicting disruptive technologies. *Marketing Science* 30: 339–54.
- Sorescu, A., R. T. Frambach, J. Singh, A. Rangaswamy, and C. Bridges. 2011. Innovations in retail business models. *Journal of Retailing* 87: S3–S16.
- Teece, D. J. 2010. Business models, business strategy and innovation. *Long Range Planning* 43: 172–94.
- Wirtz, B. W., A. Pistoia, S. Ullrich, and V. Göttel. 2016. Business models: Origin, development and future research perspectives. *Long Range Planning* 49: 36–54.
- Zott, C., and R. Amit. 2010. Business model design: An activity system perspective. *Long Range Planning* 43: 216–26.
- Zott, C., R. Amit, and L. Massa. 2011. The business model: Recent developments and future research. *Journal of Management* 37: 1019–42.