Chapter 6
Value Creation, Business Models and Organization Design in a Digital World

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ABSTRACT  In most industries, the competitive landscape is rapidly changing and, as a result, companies are speeding through their life cycles at an unprecedented pace. Whole industries are being transformed—media and entertainment, energy—and the changing positions within industries are greater than ever. Digital is the main driver of the current changes. It affects all aspects of how customers behave and how companies create and capture value. We suggest that these technological changes call for the renewed importance in understanding both value creation and principles of organization. Our aim is to address how value creation and organization design is affected by digitization—the opportunities and challenges that digitization presents. We organize our discussion around the concepts “business model” and “organization design” respectively.

KEYWORDS:  Business models | value creation | organization design

6.1 BUSINESS MODELS

A business model describes how a company creates and appropriates value (Chesbrough and Rosenbloom, 2002; Teece, 2010). We distinguish between an operational and dynamic dimension of business models (Fjeldstad and Snow, 2018). The operational dimension of a business model describes how a firm creates value for customers by performing activities, and how it appropriates a share of the value created. The operational dimension reflects choices about target customers

1. This chapter draws heavily on prior published works by the authors, which are included in the references. Specifically, Snow, Fjeldstad, Langer, 2017, Fjeldstad and Snow, 2018, and Haanæs and Fjeldstad, 2016.
and product/service offerings, as well as choices about the associated resources and activities. Value created is the difference between customers’ willingness-to-pay for the products and services and the opportunity cost of the resources. Value appropriated is the result of bargaining between the participants in larger activity system (Brandenburger and Stuart, 1996; Porter, 1985). Drucker (1954) and Porter (1985) model a business this way.

The dynamic dimension models how the firm changes its business over time. Miles and Snow (1978) describe an “adaptive cycle” in which firms solve the entrepreneurial problem of product/market positioning, the engineering problem of activities and resource configuration, and the administrative problem of balancing exploration and exploitation. Solving the entrepreneurial and engineering problems amounts to developing the operational business model. Miles and Snow identified three purposive adaptation models, which they labeled prospectors, defenders, and analyzers. Prospectors continually develop new products, services, technologies, and markets, i.e. they explore new knowledge (March, 1991). They succeed by moving first relative to their competitors. Defenders leverage their competence in developing process efficiencies for relatively stable product service lines. They search for economies of scale in markets that are predictable and expandable, i.e. they exploit existing capabilities (March, 1991). Analyzers search externally for proven technologies with significant potential for generating new products and services. They use their engineering and operational capabilities to make new products or services better and cheaper, and use their marketing capabilities to commercialize them (Haanæs and Fjeldstad, 2000). Analyzers seek ambidexterity (Tushman and O’Reilly, 2002)—they combine exploration and exploitation, albeit by forgoing radical novelty and optimal efficiency. Finally, the operational model affects the nature of exploration and exploitation because different models imply different capabilities (Fjeldstad and Haanæs, 2001).

Increasingly, firms work with their customers, suppliers, and partners when altering the elements of their business models. Among the key reasons for open innovation business models (Chesbrough, 2006) are access to diverse and situated knowledge (von Hippel, 1994), pooling knowledge resources (Boudreau, LaCetera, and Lakhani, 2011; von Hippel and von Krogh, 2003), and the delivery of products and services that depend on larger platforms and ecosystems (Gawer and Cusumano, 2002). As a result, business models increasingly extend across firm boundaries (Amit and Zott, 2015), and modifying them may affect all or part of the network the firm is embedded within.
6.1.1 A TYPOLOGY OF BUSINESS MODELS WITH IMPLICATIONS FOR DIGITIZATION

There are fundamentally different ways by which firms create value. Each of these also has distinct value propositions, roles of the customer, and mechanisms of value appropriation. That is, they represent different business models.

The value chain (Porter, 1985) is the classical way of modeling the activities of a firm. Its representation fits the typical twentieth century manufacturing process. In contrast, twenty-first century value creation is dominated by firms that create and apply knowledge, and firms that provide global networking services of various types. Such firms are modeled by the Value Shop and the Value Network respectively (Stabell and Fjeldstad, 1998). Furthermore, as a result of extensive efforts to streamline every type of business and focus on the core value creation activities, a fourth type of model has emerged at scale: firms that offer their customers access to shared resources (Fjeldstad and Lunnan, 2015; Haanaes and Fjeldstad, 2016). We briefly review each of these types below, and their particular organizational properties, followed by a discussion about the implications of digitization for each one.

6.1.2 VALUE CHAIN

A value chain transforms inputs into products. The customer is a recipient of the product, which embodies the value created by the firm’s transformation process (Ramirez, 1999). Scale, capacity utilization, and the flow of components and products are important to efficient operations, whereas the tailoring of activities to differentiated customer needs is important for value to the customer (Porter, 1985). These counteracting effects on product cost and customer value lead firms to choose between offering a standardized set of products at low cost or targeting differentiated demand with differentiated products. Embodiment of the technology in the product or in the production process is an important value-protection mechanism (Teece, 2010). A value chain forms a sequentially linked value system of suppliers, partners, and customers. Value Chains make trade-offs between cost and differentiation—standardized, one-size-fits-all products can be manufactured at low cost, whereas products targeting differentiated demand can command a premium price but will be more costly to produce (Porter, 1980; 1985). A Value Chain creates and combines components into products, and therefore operations are organized around the flow of components within the supply chain. Value Chains explore new product and process technologies and exploit them by fine-tuning them (Fjeldstad and Haanaes, 2001)
Manufacturing robotics, automation, 3D printing, sensors and digital platforms drive a fourth industrial revolution that allows mass customization—an economy that transcends the traditional trade-off between scale and customization. This revolution changes the forces of globalization by allowing for instant local production and development at low cost. The challenge for industrial firms is two-fold. First, they need to embrace digital fast. Second, they need to embrace disruption and not be defensive, as car manufacturers used to be with respect to electric and self-driving cars.

6.1.3 VALUE SHOP

A Value Shop resolves customer problems on a case-by-case basis. Examples are hospitals and consulting firms (Christensen, Grossman, and Hwang, 2008; Christensen, Wang, and van Bever, 2013). Knowledge, and therefore learning, are particularly important to value creation (Løwendahl, Revang, and Fostenløkken, 2001). Problem-solving industries such as medical care typically consist of generalists, who harbor knowledge about a variety of problems, and specialists, who have deep knowledge in a particular area. The client embodies the problem to be solved and may be an active participant in the process of creating solutions (Skjølsvik, Løwendahl, Kvålshaugen, Fosstenløkken, 2007). Value Shops form reciprocally linked value systems of referring, sub-contracting, and collaborating firms that together harness the knowledge required to develop the desired solutions. Status and intellectual property rights, in the form of patents or copyright, safeguard value appropriation. A Value Shop creates and combines competencies to deliver solutions. The organizational design favors mobilization and integration of human and information resources from the network in which the firm is embedded.

Value Shops make trade-offs between providing services that require specialist versus generalist knowledge. This trade-off is reduced with scale (Stabell and Fjeldstad, 1998). Value Shops typically explore by taking on new types of projects and exploit by diffusing knowledge within the firm, reusing it by doing standard work (Fjeldstad and Haanæs, 2001; Løwendahl, Revang, and Fostenløkken, 2001).

Law firms, management consultants, architects, engineering firms, and health care services are all being transformed by digital. Professional services use decision support systems, global databases, collaboration platforms, and communication solutions to improve both the effectiveness and the efficiency of their services. Digital technologies are augmenting and, in some cases, replacing
professionals. They allow one-man firms to be efficient, they allow networks to form instantly, and they allow for the efficient operations of global players like EY, McKinsey, BCG, and Deloitte. Digital is a requirement inside such firms and it is a requirement in their markets. Their clients expect to be working with companies that are one step ahead, not two steps behind.

6.1.4 VALUE NETWORK

A Value Network links nodes—customers, things, and places—and provides services that allow various kinds of exchanges among them. Examples of Value Networks include communication services, transportation (Huemer, LRP, 2006), banking and finance, and a wide range of Internet businesses (Afuah and Tucci, 2000). Customers co-produce their own value—but also value for other customers—by making themselves, or nodes that they control, available for networking. Therefore, network scale and composition positively affect the customer value proposition. In many Internet-based network services, there are in addition strong cost economies of scale resulting from low marginal costs associated with each new user or exchange transaction (Varian, 2000). These dual effects of size can create winner-takes-all markets (Shapiro and Varian, 1999). The value systems are vertically layered and horizontally interconnected. Layering allows one service to use another service as its infrastructure. This is common in Internet service ecosystems. Interconnection allows customers of one firm to network with customers of other firms, typical in banking and telecommunications. Lock-in is an important value appropriation mechanism when network externalities affect value creation (Farrell and Klemperer, 2007).

Value Networks create and combine connections among people, places, and things. Operationally, they organize around the platforms that enable those connections and their associated exchanges. They explore new technologies and the relationships that can be serviced by them. They exploit by increasing the size of the networks serviced (Fjeldstad and Haanæs, 2001). Finally, Value Networks trade-off the connectivity and conductivity of their services, i.e. what or who they can connect, and what can be exchanged among them (Evans and Wurster, 2000; Stabell and Fjeldstad, 1998).

Digital technologies enable much more efficient development and operations of networking services. Prominent examples of network service disruptors include Spotify, Netflix, Uber, Airbnb, Amazon, eBay, Facebook, and Google. These companies all outcompeted incumbents by creating highly efficient networking mechanisms that allowed for large scale sharing among users and linking of mul-
multiple product or service suppliers. Their users wanted to be part of the largest network because it provided the best connectivity—the richest offerings, access to the most people and places. These network service firms also all completely out-competed the incumbents on technology, providing platforms that are able to go to huge global scale fast and drive cost to deliver equally fast.

6.1.5 VALUE ACCESS

A Value Access provider insources the use of physical, informational, and human resources. Classical examples include shared facilities, data processing resources (Brandl, Jensen, and Lind, 2018) or labor pools, for example crewing agencies in shipping (Lorange and Fjeldstad, 2010). Resource access services cover all business functions ranging from IT and HR to facility management and contract manufacturing. By leveraging the total scale in the delivery of a given process across clients, a resource provider can drive up value through reliability, development and quality at the same time as it can drive down costs through shared technology platforms.

Digital is a major enabler because the firm can build global delivery at scale, whilst also offering relevant data and higher delivery quality. It is a scale and platform game, where the winner will be the one who is able to drive scale in customers and utilize technology platforms to deliver. IBM has been there for a long time, as has ISS, Securitas and all ERP players. Whereas the early twentieth century was the time of mass production of products (from cars onwards), the early twenty-first century is the time of mass delivery of services. Digital enables scale, quality, data processing, machine-to-machine communications and sensor-based surveillance.

6.1.6 INTEGRATING MULTIPLE VALUE CREATION LOGICS

A firm may use multiple value creation logics (Stabell and Fjeldstad, 1998; Humer, 2012). For example, technology development uses a Value Shop logic, whereas distribution uses a Value Network logic. In industries such as pharmaceuticals, software, and entertainment, business models that separate the value configuration logics have emerged. Effective integration and coordination across different value creation logics present important organizational design challenges.
6.2 ORGANIZING Digitally

According to Chandler (1962), “structure follows strategy”—that is, the design of an organization must support its value creation and value appropriation. Both the operational and the dynamic dimension of the business model have implications for organizational design. An organization’s coordination and control requirements arise from the value configuration underlying the operational dimension of its business model. Further, exploration favors autonomy within loosely coupled structures, whereas exploitation favors tight coupling between activities and diffusion of best practice (Weick, 1976; March, 1991). Ambidexterity necessitates more complex organizational architectures whereby exploration and exploration are separated temporarily, structurally, or contextually (Juni et al., 2013; O’Reilly and Tushman, 2013; Smith et al., 2010). In addition to affecting business model properties, digital technologies also enable radically new ways of organizing.

Digital technology is not only changing how organizations operate, but also the way we think about organizing. Organizations increasingly include digital and human agents that share the means of communication, control, and coordination. A traditional organization is arranged hierarchically—that is, control and coordination are achieved through an authority (reporting) structure in which superiors plan and coordinate the activities of subordinates, allocate resources, and resolve problems and conflicts (Simon, 1962). A hierarchical organization can be effective in stable and predictable environments because the organization does not have to regularly innovate or adapt to change. Many of today’s environments, however, are not stable and predictable; they are volatile, uncertain, complex, and even ambiguous (Johansen, 2007). Such environments are characteristic of knowledge-intensive industries like biotechnology, computers, healthcare, professional services, and national defense.

Digital technology can enable individuals, firms, cities, and governments to become smarter—to expand their capabilities and to adapt to new and changing conditions. As an agile organizational form, the digital organization will be populated with individuals and teams who are accomplished with technology and who can collaborate both inside and outside the organization to make process improvements and develop new solutions.

In previous decades, organizational responses to technological changes were mostly incremental and, in part, enabled by IT improvements that allowed greater scope and dimensionality of organizational control and coordination. Most of those adaptive responses were made within existing hierarchical forms of organizing (Altman, Nagle, and Tushman, 2015). Digital technologies, however, often
disrupt established ways of organizing and require adaptation through collabora-
tion as well as self-organization around shared situation awareness (Endsley,
2000) and knowledge commons (Hess and Ostrom, 2006; Ostrom, 1990, 2010).
This adaptive mode is faster and more effective.

Digital technologies play a role in all aspects of operating, controlling, and
coordinating the activities of organizations. Broadly speaking, they are used for
automating and augmenting tasks, communicating internally among organization
members and externally with customers and partners, and in collaborative deci-
sion making among digital and human agents (Davenport and Kirby, 2015; Eng-

The technological manifestations of disruption in organization design are
clearly visible, as are workplace changes and changes in inter-organizational rela-
tionships. What are less visible are changes in the associated design paradigm,
which enable organizations to obtain efficiency and effectiveness improvements
from investments in digital technology. The new organization design principles
are similar to those used in designing digital technologies themselves. Their roots
are found in object-oriented systems design (Dahl and Nygaard, 1966) and in the
architecture of the Internet (Krol, 1993). In organizational terms, these principles
are embodied in actor-oriented architectures, in which the locus of design is actors
who collaborate using protocols, processes, and commons (Fjeldstad, Snow,
Miles, and Lettl, 2012).

Digital technologies are also used for learning, decision making, and design.
Platform companies such as Amazon, Google, Airbnb, and Uber study the data
trails of consumer behavior to design markets for greater efficiency, and to build
new ones (Lohr, 2016).

Other companies employ digital design tools in collaborating with their custom-
ers and partners. Lego provides toolkits on its website that enable entrepreneurs
and customers to submit product ideas and start new Lego brick-based businesses
(Heinerth, Lettl, and Keinz, 2014).

In traditional organizations, technological artifacts such as manufacturing
equipment and computers are controlled by human operators. With the declining
costs of global communication and information processing, hierarchy is being by
replaced by radically different ways of organizing (Fjeldstad et al., 2012), the digi-
tal elements of which include cloud computing, big data analytics, cognitive com-
puting, and collaboration platforms. Artificial intelligence embedded in machin-
ery and tools, as exemplified above, plays an ever-larger role in emerging digital
organizations (Kolbjørnsrud, Amico, and Thomas, 2016). The digital organization
will need to integrate human and digital agents. The employees and managers will
collaborate with, rather than merely control, the technology in use. Organizing digitally means collaboration with more entities with less reliance on hierarchy for control and coordination. It also entails empowering employees, partners, and customers who use digital tools for the co-creation and co-production of products and services as well as providing digital platforms for self-organized collaboration.

Digital organizations are collaborative, agile, and minimally hierarchical. In many industries, they are populated by human and digital agents who work intelligently side by side. They rely on actor-oriented principles to enable self-organizing, which offers greater connectedness and responsiveness. (Snow, Fjeldstad, and Langer, 2017). Actor-oriented architectures turn complexity into simplicity by using procedures that different types of actors employ to contribute to the overall goal of the organization, identifying the information they need to coordinate their contributions and developing the communication protocols required to interact with one another and with the shared situational awareness.

6.3 CONCLUSIONS

Digital is the main driver of the current changes upending the business world. Digitization affects all aspects of our lives: the way we work, the way we live and the way we consume. We believe that business leaders need to understand clearly how digital enables more effective and efficient business models. Digital transforms organizations. It may radically transform the mechanisms by which activities and resources are differentiated and integrated. For more than two thousand years, we have organized people who use tools and operate machines. The advent of autonomous, intelligent agents with the ability to collaborate also changes our conception of who to organize.

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