

Inherent Cognitive Dependencies in the Transformation of Business Models from Non-digital to Digital

Erdelina Kurti^(✉)

Linnaeus University, Växjö, Sweden
erdelina.kurti@lnu.se

Abstract. Digital technologies persuasively are changing business landscape thus disrupting traditional business models of many sectors, particularly those that engage with information-based products. Organizations struggle to change their business models. Overtime business models become deeply ingrained and represent the dominant logic. This research in progress aims to explore the challenges and success factors in the transformation from traditional to digital business models. The assumed focus is on cognitive dependencies that hinder and enable such transformation given that this transformation involves a fundamental shift of core cognitive assumptions and beliefs held by the management of organizations in terms of value creation and value network.

Keywords: Digital business models · Cognitive dependencies

1 Introduction

Rapid developments of Information and Communication Technologies (ICTs) and digitalization are creating numerous opportunities for organizations. Many new ventures (EBay, Spotify, Netflix etc.) have taken advantage of these developments, creating novel business models and at the same time disrupting business models of incumbent organizations [1, 4]. The impact of digital innovation has been prevalent particularly for business models of organizations that deal with information-based products due to their potential to be fully digitized [13]. In order to succeed incumbents must innovate their business models. Nevertheless literature and practice indicates that business model change is multifaceted and only few such transformations succeed [6, 15]. The question is, why is business model change difficult for incumbent organizations? Why some organizations are actually able to adapt while others fail? A recurring explanation in the business model literature is that overtime business models become path-dependent and represent the management dominant logic of value creation. Managers become cognitively bounded by this logic and these cognitive schemas or as often called knowledge structures act as a funnel that filters information, with an attention directed only on the data that conform to the dominant logic while discharging others. For example, Polaroid's failure to adapt to digital imaging is predominantly attributed to the inability of altering managerial strong beliefs in the analogue model [18]. Similar explanations are found in the shift of newspapers from print to online [9].

The purpose of this study is to explore the challenges and success factors in the transformation from traditional to digital business models. The assumed focus is on cognitive dependencies that hinder and enable such transformation. We argue that focusing on cognitive dependencies is important for two reasons. First, transformation from traditional business models to digital business models imposes certain cognitive dependencies due to the significantly distinct nature of these logics. Non-digital businesses function in terms of conventional economic wisdom while digital business models function within the economics of digital information, e.g. negligible marginal costs, significance of network effects, new revenue models, information asymmetry shrinking, transaction cost reduction etc. Second, the boundary-spanning nature of the business model imposes a multi-actor thinking. This feature becomes more evident in the digital word, which challenges the traditional view that value is created within boundaries of the firm only [7]. Consequently, transforming a business model from traditional to digital requires coordination between several actors, each operating on their own dominant logics thus requiring a synchronization of multiple logics. This transformation involves a fundamental shift of core cognitive assumptions and beliefs held by the management of organizations in terms of value creation and value network.

The rest of the paper is structured as follows. We begin by providing a review of digital business models and the economics of digital information. Next, we proceed to explain the relation between cognitive dependencies and business models. We then discuss the theoretical and managerial implications of the study.

2 Digital Business Models and the Underlying Economics of Digital Information

Business models emerged as a term during the dot-com hype, a period that was characterized with emergence of many new ventures that began to conduct business online. The trend, however, faded quickly with most of these ventures failing. This failure was mostly attributed to the firms adopting flawed business models. Later, a renewed interest was marked, stemming from several fields, using the business model construct to explain the phenomena such as e-business and use of IT in organizations, strategic issues such as value creation, firm performance and innovation and technology management [23].

Digital business models or IT-enabled business models [14] represent one instance of digital innovation alongside product and process innovation [8]. Digital innovation refers to any innovation that is ICT enabled that results in creation of new forms of digitalization [21]. Amit and Zott [2] explored the theoretical foundations of the business model construct by investigating the sources of value creation in e-businesses. Their results show that no single strategy and entrepreneurship theory of value creation such as transaction cost economics, strategic networks, resource bases view, value chain, Schumpeterian innovation can fully account and explain the value creation in the digital world. Value creation in the digital world requires an integration of these theories, enabled by the business model construct itself. In this context a business model is defined as a ‘*system of interdependent activities that transcend the focal firm and spans its boundaries*’ [22]. This conceptualization is inherently comprehensive

since it accounts for the mutual interdependence between a firm and its business environment.

Weill and Woerner [20] elegantly illustrate this with a simple example of Wall Street Journal. In the traditional newspaper industry, Wall Street Journal was responsible in producing its own content of the newspaper articles and related photos. This content was then placed in printed newspaper with all the cosmetics and details that newspapers like any other publication needs. Thousands of copies needed to be print and delivered through established infrastructure (e.g. people, trucks). Carefully planned integration and management of these components produced customer value. In the digital world these components have changed. Content of newspaper is no longer as proprietary and has expanded, with Wall Street Journal obtaining content from other sources and engaging other partners to deliver the content to customers. Wall Street does not control infrastructure in the digital world anymore. Infrastructure involves a combination of internal and external digital platforms that can be accessed anytime and everywhere.

As we see from the illustration, traditional business world is product focused, tangible and customer transaction oriented, that operates according to the conventional economic wisdom, while digital realm is concerned with customers' experience and with focus on digital information-based products [20] that challenge the conventional economic rules. Instead they function according to the economics of digital information that involves some inherent unique features such importance of network effects, negligible marginal costs, different pricing mechanisms, reduction of transaction costs, shrinking of information asymmetry and different revenue models [2, 19]. These features make digital information difficult to translate and address in economic terms [10] and require a new set of assumptions, because the production, distribution and consumption of digital information products encompasses a distinct inherent logic [3, 19]. Adaption to the new logic that digital context brings to the forefront, requires a shift of managerial cognitive frames that are ingrained with the old traditional logic.

3 Cognitive Dependencies as a Barrier to Business Model Change

The role of cognition in organizations can be traced back to [11] who claimed that managers are embedded in certain cognitive structures and when faced with uncertain environment that fall outside these structures, managers draw upon these frames to create simplified representations of the information environment. Cognitive perspective is argued to have a great potential to offer insights into any type of organizational renewal. Despite the importance, the way cognitions shape innovation processes have not been empirically examined [17].

Several authors [5, 6, 16, 18] have explored the role of cognitive dependencies in business model change. Cognitive structures or as referred in the business model context as business model schemas are conceptualized as involving '*concepts and relations 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*' [12]. There is a common agreement that cognitive

frames represent the main driver of path dependence of business models and are crucial in shaping business model change [5, 16]. Although these studies are very insightful and provide a solid foundation, there are some noted limitations. None of the studies particularly address the transformation of the business model from traditional to digital. Sandström and Osborne [15] argue that previous explanations on challenges that incumbents face when changing their business models are not specific for business models but instead they draw on previous arguments deriving from the product innovation and technology management literature and moreover apply to any type of organizational change. The role of managerial cognition occupies a central place in the literature of technology innovation management [6, 18]. While these studies provide deep insights about the role of cognitive dependencies in business model change they approach technology as a black box. Opening the black box is crucial for digital technologies due to the unique properties that are not inherent in any type of other technologies. Moreover [15] argue that challenges that are specific to business model should be intertwined to its network of multi actors, which means that business model is not controlled by the firm itself. This perspective however is often overlooked in previous studies, particularly in those that investigate the role of dominant logic in business model change.

4 Discussion

This paper presents a research in progress that aims to explore the key challenges and success factors involved in the transformation of the business model from traditional to digital. The assumed focus is on cognitive dependencies that hinder and enable such transformation. A central argument around which this study revolves is on the fundamental distinctions between non-digital and digital business models. We argue that traditional business models are guided by conventional economic wisdom whereas digital business models by the economics of digital information. We derive this argument on explanations drawing on the fundamental properties of digital technology and economics of digital information that involve negligible marginal costs, significance of network effects, new revenue models, information asymmetry shrinking, transaction cost reduction etc. Moreover, we argue that exploration of cognitive dependencies and success factors in the transformation of business model should account for boundary-spanning nature of the business model as the most unique feature that differentiates it from other constructs. Digital transformations profoundly change the whole notion of value creation and capture and as such cannot be conceived without the value network, like eBay, Facebook, YouTube who cannot be comprehended without their networks.

The study will contribute to the rather nascent literature on the dynamics of business models. While previous scholarly contributions have given insights about the role of cognitive dependencies and path dependence in general [5, 6, 16] digital context exposes organizations to novel forms of value creation and capture that are quite distinct from the conventional ones, thus requiring a fundamental shift of dominant logic. Given that digital businesses represent the most dynamic and a crucial segment of the new economy, this study will unleash significant implications to the practice.

It will inform managers of information intensive organizations engaged in business model change endeavors by providing a set of structured processes and guidelines that firms can use systematically about cognitive hindrances and success factors to overcome these challenges.

References

1. Al-Debei, M.M., El-Haddadeh, R., Avison, D.: Defining the business model in the new world of digital business. In: *Proceedings of the 14th Americas Conference on Information Systems (AMCIS 2008)*, Toronto, Canada, pp. 1–11 (2008)
2. Amit, R., Zott, C.: Value creation in e-business. *Strateg. Manag. J.* **22**(6–7), 493–520 (2001)
3. Benkler, J.: *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven (2006)
4. Bharadwaj, A., El Sawy, O.A., Pavlou, P.A., Venkatraman, N.: Digital business strategy: toward a new generation of insights. *MIS Q.* **33**(1), 204–208 (2013)
5. Bohnsack, R., Pinkse, J., Kolk, A.: Business models for sustainable technologies: exploring business model evolution in the case of electric vehicles. *Res. Policy* **43**(2), 284–300 (2014)
6. Chesbrough, H., Rosenbloom, R.S.: The role of the business model in capturing value from innovation: evidence from xerox corporation's technology spin-off companies. *Ind. Corp. Change* **11**(3), 529–555 (2002)
7. El Sawy, O.A., Pereira, F.: Digital business models: review and synthesis. In: *Business Modelling in the Dynamic Digital Space*. Springer, Heidelberg (2013)
8. Fichman, R.G., Dos Santos, B., Zheng, Z.: Digital Innovation as a fundamental and powerful concept in the information systems curriculum. *MIS Q.* **38**(2), 329–353 (2014)
9. Gilbert, C.G.: Unbundling the structure of inertia: resource versus routine rigidity. *Acad. Manag. J.* **48**, 741–763 (2005)
10. Lester, J., Koehler, W.: *Fundamentals of Information Studies: Understanding Information and Its Environment*, 2nd edn. Neal-Schuman, New York (2007)
11. March, J.G., Simon, H.A.: *Organizations*. Wiley, New York (1958)
12. Martins, L., Rindova, V.P., Greenbaum, B.: Unlocking the hidden value of concepts: a cognitive approach to business model innovation. *Strateg. Entrepreneurship J.* **9**(1), 99–117 (2015)
13. Nylén, D., Holmström, J.: Digital innovation strategy: a framework for diagnosing and improving digital product and service innovation. *Bus. Horiz.* **58**, 57–67 (2015)
14. Rai, A., Tang, X.: Research commentary—information technology-enabled business models: a conceptual framework and a coevolution perspective for future research. *Inf. Syst. Res.* **25**(1), 1–14 (2013)
15. Sandstrom, C., Osborne, R.G.: Managing business model renewal. *Int. J. Bus. Syst. Res.* **5**(5), 461–474 (2011)
16. Sosna, M., Treviño-Rodríguez, R.N., Velamuri, S.R.: Business model innovation through trial-and-error learning: the naturhouse case. *Long Range Plan.* **43**(2–3), 383–407 (2010)
17. Thrane, S., Blaabjerg, S., Hannemann Møller, R.: Innovative path dependence: making sense of product and service innovation in path dependent innovation processes. *Res. Policy* **39**, 932–944 (2010)
18. Tripsas, M., Gavetti, G.: Capabilities, cognition, and inertia: evidence from digital imaging. *Strateg. Manag. J.* **21**(10/11), 1147–1161 (2000)
19. Varian, H.R.: *Markets for Information Goods*. University of California, Berkeley (1998)

20. Weill, P., Woerner, S.L.: Optimizing your digital business model. *MIT Sloan Manage. Rev.* **54**(3), 71–78 (2013)
21. Yoo, Y., Lyytinen, K., Boland, R., Berente, N., Gaskin, J., Schutz, D., Srinivasan, N.: *The Next Wave of Digital Innovation: Opportunities and Challenges: A Report on the Research Workshop Digital Challenges in Innovation Research*, Fox School of Business, Temple University, PA, USA. (2010)
22. Zott, C., Amit, R.: Designing your future business model: an activity system perspective. *Long Range Plan.* **43**, 216–226 (2010)
23. Zott, C., Amit, R., Massa, L.: The business model: recent developments and future research. *J. Manag.* **37**(4), 1019–1104 (2011)