Business Horizons (2014) xxx, xxx—xxx

Available online at www.sciencedirect.com

ScienceDirect

KELLEY SCHOOL OF BUSINESS
INDIANA UNIVERSITY

www.elsevier.com/locate/bushor

Digital innovation strategy: A framework for diagnosing and improving digital product and service innovation

Daniel Nylén *, **Jonny Holmström**

Swedish Center for Digital Innovation, Department of Informatics, Umeå University, S-901 87 Umeå, Sweden

KEYWORDS
Digital innovation;
Strategy;
Value proposition;
User experience;
Improvisation

Abstract Digital technology is increasingly important in achieving business goals, and its pervasive effects have resulted in the radical restructuring of entire industries. Consequently, managers' extensive interest in handling digital innovation is not surprising. Recent research has illustrated how digital technologies give rise to a vast potential for product and service innovation that is difficult to control and predict. Therefore, firms need dynamic tools to support themselves in managing the new types of digital innovation processes that emerge. The nature of these processes forces firms to challenge prior assumptions about their product and service portfolio, their digital environment, and ways of organizing innovation work. In this article, we present a managerial framework that supports firms in this undertaking. The framework, geared at supporting ongoing improvements in digital innovation management, covers five key areas: user experience, value proposition, digital evolution scanning, skills, and improvisation. We also present a diagnostic tool that can be utilized as firms begin the process of implementing the framework. Finally, we conclude with our thoughts on the managerial implications of the framework when going forward in a rapidly changing digital innovation landscape.

1. The perils and promises of the digital world

Digital technology has become increasingly important as firms seek to achieve their business goals. However, recent research (e.g., Grover & Kohli, 2012) has highlighted difficulties in evaluating the value generated by digital technology investments. In the 1990s, a first generation of IT applications enabled firms to streamline their internal operations while providing opportunities for process innovation (Lee & Berente, 2012). More recently, digital technology expanded beyond internal dimensions, penetrating firms' product and service offerings (Yoo, Boland, Lyytinen, & Majchrzak, 2012).

* Corresponding author
E-mail addresses: daniel.nylen@informatik.umu.se (D. Nylén), jonny.holmstrom@informatik.umu.se (J. Holmström)

http://dx.doi.org/10.1016/j.bushor.2014.09.001

Given digital technology's central role in the radical restructuring of a number of industries (e.g., Evans, Hagiu, & Schmalensee, 2006), managers' extensive interest in handling digital product and service innovation is not surprising. Addressing this interest, we present a framework that both motivates and keeps track of firms' digital innovation efforts.

The unique properties of digital technology enable new types of innovation processes that are particularly rapid and difficult to control and predict (Henfridsson, Mathiassen, & Svahn, 2014; Yoo et al., 2012; Yoo, Lyytinen, Boland, & Berente, 2010). Therefore, firms need dynamic tools to support them in managing their digital innovation efforts. To this end, our framework identifies five key areas to be measured and evaluated in seeking to manage digital product and service innovation:

- First, digital products and services must not only be efficient to use and easy to learn, but also provide a rich *user experience*. Such user experience can be measured on its levels of usability, aesthetics, and engagement.

- Second, firms need to clearly articulate the *value proposition* of each digital product and service: How do they create value for the users? The quality of such value propositions is assessed on the dynamics of customer segmentation, product and service bundling, and commissions to channel owners.

- Third, *digital evolution scanning* involves gathering intelligence on new devices; digital channels such as web services, mobile operating systems, and social media; and app stores—as well as standards and APIs—in order to identify and exploit opportunities for innovation across emerging use contexts and new user behaviors.

- Fourth, as digital innovation requires new *skills*, firms need to evaluate their mechanisms for supporting continuous learning of the unique properties of digital technologies in order to set up dynamic innovation teams.

- Fifth—and finally—as digital innovation processes are often ignited when organizational members extemporize with digital technology in a learning-by-doing fashion, assessing the available space and time for *improvisation* and the mechanisms for coordinating such efforts is key.

The process of implementing the framework presented in this article involves making informed decisions that cut across three dimensions: the firm's products, its digital environment, and organizational properties. By obtaining composite measures for each area, the framework enables firms to effectively manage their digital product and service portfolio over time. While implementing the framework enables firms to harness an expanded scope of digital innovation benefits, it should be noted that such an effort requires planning and preparation. Sufficient time must be allocated for the process, and since it involves change throughout the organization, unintended consequences are likely to occur along the way. To support the first step of the implementation process, we present a diagnostic tool that allows organizational members to score their current operations. This enables the firm to get started in evaluating and measuring its digital innovation efforts. The outcome of implementing the framework is a readiness for digital innovation whereby firms continuously adjust their operations in order to harness the benefits of digital innovation.

In presenting the framework, this article is structured as follows: In Section 2, we explain the ways in which innovation is cast in a new light due to digital technology, highlighting the key challenges involved when managing digital product and service innovation. These insights are captured by our framework, which is presented in Section 3. Presenting the framework, we describe the elements to be measured and how they can be utilized to motivate and keep track of the firm's digital innovation efforts. In Section 4, we present a diagnostic tool that can be utilized as firms begin the process of implementing the framework. Finally, in Section 5, we conclude by presenting our thoughts on the managerial implications of the framework when going forward in a rapidly changing digital innovation landscape.

2. Digital innovation: What's new?

As information is increasingly digitized and mobile devices accelerate in pervasiveness and processing power, an arena and architecture for innovation is opened up—one in which physical and digital components are combined (Yoo et al., 2012). Recent research (Henfridsson et al., 2014; Yoo et al., 2012) has highlighted how the unique properties of digital technology enable new types of innovation processes that are distinctively different from the analog innovation processes of the Industrial Era. In the following sections, we explore the topic of digital innovation in more detail. In doing so, we discuss the challenges in managing digital innovation (2.1.), explore the unique properties of digital innovation processes (2.2.), and contextualize the phenomenon of digital innovation, providing a number of illustrative examples (2.3.).