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Championing Digital Innovation Success: The Role of CDOs

Research-in-Progress

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Abstract

The disruptive nature of digital innovation has led incumbent organizations to face enormous challenges and pressure. To address the fundamentally new nature of digital innovations, incumbents have established new managerial roles, such as Chief Digital Officers (CDOs), to champion innovation. We explore the role these innovation champions play for digital innovation success and argue that internal reorganization and the sourcing of external knowledge constitute important mechanisms through which CDOs might contribute to organizations' digital innovation success. We will empirically test our proposed research model using longitudinal data on the world's largest companies. Our study is expected to contribute to literature on knowledge recombination and innovation management by examining how innovation champions at the C-level use internal reorganization and sourcing of external knowledge to enhance digital innovation success.

Keywords: Innovation champions, digital innovation success, knowledge recombination, internal reorganization, sourcing of external knowledge

Introduction

Digital innovation increasingly permeates every aspect of today's society and alters the way we live and work (Nambisan et al. 2017). Digital innovation can be defined as "carrying out new combinations of digital and physical components to produce novel products" (Yoo et al. 2010). In the last decade, we have witnessed the rise of numerous digital innovations – e.g., mobile and cloud computing, machine learning, 3D printing, internet of things – all of which have the potential to disrupt established industries and spark numerous waves of creative destruction (Fichman et al. 2014; Schumpeter 1950; Wortmann and Flüchter 2015). Accordingly, incumbents face enormous challenges and pressure due to disruptive digital innovation created by new entrants (Christensen and Overdorf 2000; Svahn et al. 2017). Therefore, establishing an understanding on how organizations can benefit from digitization and digital innovation is vital.

Hand in hand with the increasing prevalence of digital innovation, the boundaries of companies are increasingly blurring (Nambisan et al. 2017). This is due to the fact that by digitizing a formerly analogue product, process or service it becomes communicable, memorable, malleable, programmable

and associable (Fichman et al. 2014; Yoo 2010). These digital characteristics facilitate the transfer of and access to digitized resources beyond the boundaries of a company, allowing companies to easily tap into external knowledge and skills (Majchrzak and Malhotra 2013; Saldanha et al. 2017). As innovation builds on the exchange and recombination of knowledge (Arthur 2011; Fleming 2001; Schumpeter 1934), the integration of external sources of knowledge into the innovation process enables an abundance of new recombination and offers large opportunities (Benner and Tushman 2015; Nambisan et al. 2017; Yoo et al. 2012). At the same time, these characteristics also lead to an increase in the heterogeneity of knowledge in the innovation process, since firms are now able to access and recombine knowledge from different industries, and thus knowledge domains new to the firm, in new digital products and services (Barrett et al. 2012; Yoo et al. 2012).

In order to address the properties of digital innovations such as knowledge heterogeneity and blurring boundaries (Nambisan et al. 2017) incumbent organizations have developed digital transformation strategies and established new managerial roles such as the Chief Digital Officer (CDO). The literature describes CDOs as entrepreneurs, digital evangelist and coordinators (Haffke et al. 2016; Singh and Hess 2017) who act as pioneers in the digital transformation of the organization and champion digital innovation. In the innovation management literature, a similar role is assumed by innovation champions, actors who promote an innovation vigorously through the various stages of the development process against potential resistance (Howell and Shea 2001; Jervis 1975; Maidique 1984). Innovation champions can be found at different levels and functions (Jervis 1975; Markham et al. 1991), including high hierarchical levels (Hameed et al. 2012; Markham 2000). They connect different knowledge domains inside and outside a company and acquire as well as coordinate resources for innovation development (Boari and Riboldazzi, 2014; Maidique, 1980).

As mentioned above, prior research also investigates enabling factors for innovation success through sourcing of external knowledge (e.g., Hagedoorn and Duysters 2002), for instance, in the form of alliances as well as mergers and acquisitions (M&A) to acquire distant knowledge (de Man and Duysters 2005). Similarly, internal reorganization, such as the creation, deletion or recombination of business units, enables a company to create new knowledge through recombining formerly unconnected knowledge elements (Karim 2009; Karim and Kaul 2015). The ability of CDOs as innovation champions to affect the orchestration of diverse knowledge sets – from both inside and outside the firm – may be the key driver for firms to tap into external knowledge sources and reorganize internally to achieve digital innovation success.

However, the interplay of internal and external knowledge acquisition and combination with innovation champions in a digital context has rarely been addressed in IS literature, as recent calls for research on the role of digital innovation actors (Nambisan et al. 2017) and digital transformation have illustrated (e.g., Lucas et al., 2013; Yoo et al., 2010). As a step towards closing this gap, we seek to build a thorough understanding of the relation between innovation champions on the C-level and digital innovation success. Therefore, we pose the following research question:

What is the role of CDOs as innovation champions for digital innovation success?

This research draws on findings from the literature on innovation champions (Howell and Shea 2001; Jervis 1975; Maidique 1984), internal reorganization (Karim 2006; Karim and Kaul 2015), and external sourcing of knowledge (de Man and Duysters 2005; Hagedoorn and Duysters 2002; Hildebrandt et al. 2015). After introducing related literature we derive our research model. Finally, we outline the proposed research methodology that builds on the analysis of panel data of the world's largest companies from 2000 to 2016 on the firm level.

Research Background

Internal Reorganization for Knowledge Recombination and Innovation

Schumpeter remarked that the creation of innovations “consists to a substantial extent of a recombination of conceptual and physical materials that were previously in existence” (Schumpeter 1934, p. 88). Contemporary research on digital innovation builds upon this definition and characterizes digital innovation as the “carrying out of new combinations of digital and physical

components to produce novel products” (Yoo et al. 2010, p. 725). To facilitate the recombination of knowledge, companies strive to minimize communication and coordination costs by digitizing work processes and creating common identities, beliefs and work-routines embedded in a shared corporate context (Karim 2009; Kogut and Zander 1992, 1996; Nahapiet and Ghoshal 1998).

However, while this makes existing networks more efficient, it also hinders the emergence of new knowledge recombination outside existing networks and routines. By conducting internal reorganization – the removal, merger, creation or recombination of existing units – companies can challenge the status quo and support the recombination of formerly unconnected areas of expertise (Galunic and Rodan 1998; Karim and Kaul 2015; Kogut and Zander 1992).

Karim (2009) found that business unit reorganization has a U-shaped relationship with innovation outcomes, meaning that a company needs to conduct several reorganizations within a three- to four year time window before benefitting from higher innovation outcomes, thereby, supporting the results of Halebian and Finkelstein (1999). However, an interesting caveat is that structural reorganization can have a positive as well as a negative impact on innovation outcomes. The outcome depends on the quality of existing knowledge, knowledge coherence and the path dependence within the company (Karim and Kaul 2015).

External Sourcing of Knowledge for Innovation

External sourcing of knowledge refers to the identification of and “access to relevant knowledge that is being created in the environment” (Eisenhardt and Santos 2000, p. 14). Due to the progressively digitized environment the external boundaries of companies are successively blurring (Nambisan et al. 2017) allowing companies to easily tap into external expertise and resources (Saldanha et al. 2017).

We argue that there are numerous mechanisms through which a company can source external knowledge. For this paper we distinguish between permanent integration of an external actor and temporary collaborations. Permanent integration of an external actor may take place, e.g., through M&A which occurs when two or more firms merge into one entity (de Man and Duysters 2005; Hagedoorn and Duysters 2002). There are numerous approaches to temporary collaborations forms as well, such as open innovation (Chesbrough 2006), strategic alliances for R&D collaborations (Osborn and Hagedoorn 1997), and crowdsourcing (Boudreau and Lakhani 2013; Majchrzak and Malhotra 2013). While Hildebrandt et al. (2015) found a positive relationship between digitally enabled mergers and digital business model innovativeness, Man and Duyster (2005) argue that temporary collaboration such as strategic alliances almost always outperform M&As in terms of ensuing innovation. However, while there is no consensus as to which approach is the most feasible, there is a consensus that companies need to work with external knowledge, actors and resources in order to maintain high levels of innovation (Chesbrough 2015). This is also shown by higher market valuations when a firm announces to be part of an “open innovation alliance” (Han et al. 2012).

Research Model

Based on the research background provided in the previous section, we derive our propositions and the research model. Our research explores a situation in which the CDO position is already established. Building on this assumption we then consider the internal and external knowledge acquisition strategies to promote an organization’s digital innovation success. While we acknowledge that the processes of internal reorganization and sourcing of external knowledge could themselves lead to the creation of the position of a CDO, we consider this to be outside the scope of this research paper. The propositions P1, P2, P5 and P6 display the core of this research paper and aim to extend existing knowledge. These propositions discuss the innovation champion (represented by the CDO) and its role in digital innovation. At the same time, we connect with and build on extant literature by stating our propositions P3 and P4, as the link between internal reorganization and external sourcing of knowledge has been researched previously. However, we add to this strand of the literature, as the link has rarely been explored in the context of digital innovation. Figure 1 displays the research model that is discussed in detail below.

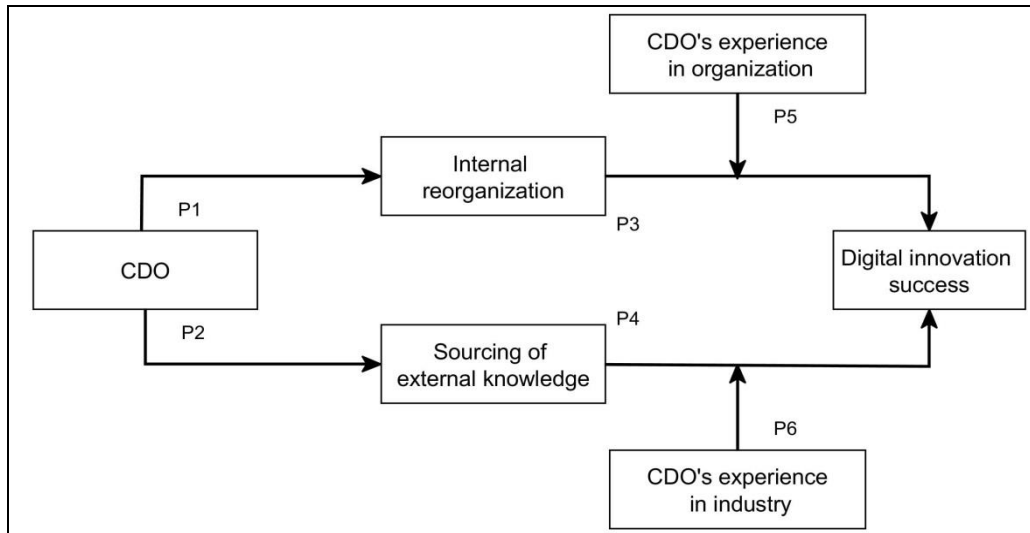


Figure 1. Research Model

We now turn to the relationship between an innovation champion at the C-level and internal reorganization, or sourcing of external knowledge, respectively. Extant research shows that the presence of innovation champions is positively associated with the performance of innovation projects (Howell et al. 2005). We propose internal reorganization and sourcing of external knowledge to mediate this relationship. These measures form mediators because they reveal why and how innovation champions enhance the dependent variable, digital innovation success. Therefore, they “intervene[s] between input and output” (Baron and Kenny 1986, p. 1176). Internal reorganization refers to “the creation, deletion, or recombination of business units within a firm” (Karim 2009, p. 1237). The sourcing of external knowledge is defined as tapping into and engaging with external knowledge in some form (e.g., Chesbrough 2003; Hippel and Katz 2002). CDOs in their role as innovation champions play a significant role in internal reorganization and sourcing of external knowledge. For instance, they play a great role in connecting different knowledge domains inside and outside a company (Boari and Riboldazzi 2014; Howell and Shea 2001), transferring information and knowledge (Chakrabarti and Hauschildt 1989; Hayton and Kelly 2006), and orchestrating the acquisition of resources for the development of innovations (Maidique 1984). In management positions and in particular at the C-level, innovation champions are able to use their power and diplomatic talent to acquire the knowledge resources necessary for successful innovation (Chakrabarti and Hauschildt 1989; Markham 2000). CDOs are able to assess the value of combining knowledge domains that reside within different units or parts of units and connect them by influencing organizational reorganization through their power and diplomatic talent (Mansfeld et al. 2010; Markham 1998). In a similar vein, CDOs influence the sourcing of external knowledge that depicts means of discovering and obtaining new knowledge sources (Eisenhardt and Santos 2000; Karim and Kaul 2015). Consequently, we postulate the following propositions:

P1: CDOs as innovation champions positively influence internal reorganization.

P2: CDOs as innovation champions positively influence the sourcing of external knowledge.

Next, we discuss the relationships between digital innovation success and internal reorganization and sourcing of external knowledge. By recombining previously unconnected business units within the company it is possible to generate possibilities for novel knowledge recombination by overcoming path dependence and inertia (e.g., Karim 2006, 2009; Karim and Kaul 2015). Similarly, sourcing of external knowledge, enables companies to recombine internal knowledge with external knowledge (e.g., Chesbrough 2006; Hildebrandt et al. 2015; Majchrzak and Malhotra 2013; Saldanha et al. 2017). Therefore, both mechanisms – internal reorganization and sourcing of external knowledge – create the chance for novel recombination of knowledge, technologies and concepts. Drawing on the well-established findings of the recombination literature which highlight recombination abilities as the major driver behind innovation (e.g., Carnabuci and Operti 2013; Fleming 2001; Galunic and Rodan

1998; Schumpeter 1934; Yoo et al. 2010) we argue that internal reorganization and sourcing external knowledge have a positive influence on innovation success. Since a digitalized environment offers companies the additional possibility to recombine formerly analogue products and services with a digital component, this argument is especially fitting for digital innovation success (Nambisan et al. 2017; Yoo et al. 2010). Hence, we postulate the following propositions:

P3: Internal reorganization with the goal of acquiring new knowledge positively influences digital innovation success.

P4: Sourcing of external knowledge with the goal of acquiring new knowledge positively influences digital innovation success.

We now turn to the moderating effects of CDO's prior experience on the relationship between internal reorganization and digital innovation success. The innovation management literature emphasizes the role of experience for innovation champions' effectiveness (e.g., Hayton and Kelley 2006; Jenssen and Jørgensen 2004). Champions with long company experience have gained organizational knowledge by working in different departments and possess an extensive social network inside an organization (e.g., Howell and Higgins 1990; Obstfeld 2005; Roure 2001). Similarly, innovation champions with numerous years of industry experience are likely to possess considerable expertise in the respective business area and a large external network (e.g., Howell and Shea 2001; Jenssen and Jørgensen 2004).

Consequently, the acquired knowledge enables CDOs not only to identify organizational and technological opportunities arising inside and outside the organization but also to connect different units and internal and external sources in order to exploit the potentials created by combining different knowledge domains. By connecting the most promising new internal or external sources of knowledge, champions are able to prepare the organization for subsequent innovation processes (e.g., Hayton and Kelley 2006) that eventually result in digital innovation. Additionally, an expansive internal network allows innovation champions to promote knowledge sharing across organizational boundaries and exercise the necessary influence in promoting subsequent recombination and exploitation of different knowledge sources effectively (e.g., Howell and Shea 2001; Roure 2001). Similarly, external ties enable inter-organizational knowledge sharing and spur innovation success (Howell and Higgins 1990; Jenssen and Nybakk 2009). Therefore, we formulate the following propositions:

P5: Champion's prior experience in the organization positively moderates the effect of internal reorganization on digital innovation success.

P6: Champion's prior experience in the industry, positively moderates the effect of sourcing of external knowledge on digital innovation success.

Research Method

Methodologically, we plan to use panel data on the firm level to empirically analyze how internal reorganization and sourcing of external knowledge initiated and coordinated by the innovation champions lead to digital innovation success. Therefore, we employ a multivariate regression analysis based on a longitudinal dataset of the world's largest manufacturers from 2000 to 2016. This approach allows us to control for time- and firm-fixed effects and to eliminate potential sources of endogeneity. Sourcing of external knowledge (M&As) and internal reorganization (establishing digital structures) are identified by scanning press releases and annual reports. The data of innovation champions on the executive level will be obtained from Thomson Reuters Officers and Directors. Digital innovation success will be measured by patent data on digital technology (cf. Ahuja and Morris Lampert 2001; Gilsing et al. 2008).

Potential Contribution to Literature

Theoretically, we extend previous work on knowledge recombination in a digital context by examining how innovation champions use internal reorganization and sourcing of external knowledge to enhance digital innovation success. We strive to provide empirical evidence for the digital

transformation and thus follow Yoo et al.'s (2010) call to investigate this highly relevant phenomenon as well as Lucas et al.'s (2013) invitation to examine IS-driven transformations.

Furthermore, we empirically explore the role of the innovation champion at the C-level in coordinating these organizational changes (Haffke et al. 2016; Karim and Kaul 2015). We do not only shed light on how firms can master the digital transformation, i.e., by being open towards and integrating heterogeneous knowledge, but also demonstrate the positive impacts and importance of innovation champions.

Additionally, our findings point to the importance of knowledge recombination in digital innovations, as they, per definition, require integrating diverse and dispersed knowledge (e.g., Yoo et al. 2012). Knowledge recombination involves searching for existing elements of knowledge, problems or solutions by reconfiguring the ways that knowledge elements lead to the creation of innovation (Fleming 2001; Henderson and Clark 1990).

Moreover, we provide managerial guidance on how firms can accomplish digital innovation success by acknowledging the importance of innovation champions. In addition, we identify that managers must avoid the pitfall of "just buying" digital knowledge on the market. Instead, the organizational ability to orchestrate knowledge internally and externally will be a core competence in the digital era, due to the distinct characteristics of digital innovation (Yoo et al. 2012).

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