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# At the Crossroads between Digital Innovation and Digital Transformation

*Professional Development Workshop (PDW)*

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## Abstract

*Consumerization, democratization, and platform business logics are not only creating opportunities for new product development, new business models, and new ways of organizing, but in addition are also driving the transformation of established organizational resources and routines. This PDW is designed to address questions at the intersection of digital innovation and digital transformation. These topics are interrelated as successive waves of digital innovation within an industry or at the level of an individual firm and its ecosystem may lead to fundamental transformation of structures, roles and management, culture, competencies and skills, and so forth, depending on the influence of barriers such as inertia and resistance to change. By exploring how and why the new organizing logic of digital innovation impacts and transforms incumbent firms, the workshop addresses questions from four different areas: (1) Why the new logic of digital innovation triggers a digital transformation in incumbent firms; (2) the drivers of this digital transformation in incumbent firms' immediate environment; (3) how these drivers may under certain conditions alter the structure, strategy, culture, competencies, skills and technology platforms of incumbent firms; (4) the trajectories of digital transformation journeys inside incumbent firms.*

**Keywords:** Digital Innovation, Digital Transformation, PDW

## Introduction

This PDW is designed to address questions at the intersection of digital innovation and digital transformation. The burgeoning literature stream on digital innovation has shed light on the unique characteristics or properties of digital technologies, their flexibility, malleability, and so forth (e.g., Kallinikos et al. 2013). Extant literature has also identified how digital technologies through these unique properties offer new opportunities for the creation of new infrastructures, products, and business models (Andal-Ancion et al. 2003; Henfridsson and Bygstad 2013; Lytinen et al. 2016; Nambisan et al. 2017), reshaping ways of organizing for innovation along the way (Yoo et al. 2012). These topics have been the

focus of research about digital innovation (Nambisan et al. 2017; Yoo et al. 2010), which is defined as “the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology” (Nambisan et al. 2017, p. 224).

At the same time, however, digital technologies not only provide new opportunities for digital innovation but also impact society, that is, each individual, more directly than ever before. Digital technologies have become significantly more affordable and accessible to everyone, embedding themselves into society and changing consumer behaviors and expectations – a phenomenon that has been theorized in terms of IT consumerization (Gregory et al. 2018). Furthermore, the fusion of digital technologies within firms’ environments (Woodard et al. 2013) produces ongoing changes not only in customer expectations but also in the competitive landscape as entry barriers are lowered and new platform business models rise at exponential growth rates (Hansen and Sia 2015; Huang et al. 2017; Sia et al. 2016). This democratization process combined with consumerization puts large established firms under significant pressure to transform their legacy systems and organizational structures, overcome structural inertia, and reinvent their models and approaches to value creation and capture (Bharadwaj et al. 2013; Sebastian et al. 2017).

As large established organizations embark on strategic transformation initiatives, they may carry out significant structural changes across different levels. An emerging research stream focuses on questions surrounding digital transformation (Hinings et al. 2018; Vial 2019), “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies” (Vial 2019, p. 118).

The topics of digital innovation and digital transformation are interrelated. Successive waves of digital innovation within an industry or at the level of an individual firm and its ecosystem may lead to fundamental transformation of structures, roles and management (Tumbas et al. 2018), culture, competencies and skills, and so forth, depending on the influence of barriers such as inertia and resistance to change (Vial 2019).

The importance of taking stock of what we know about digital innovation and shedding more light on what is unique about the novel phenomenon of digital transformation – compared to IT function-driven and enterprise systems-enabled organizational transformations of the past – is underscored by the recent emphasis in the literature to expand the research agenda on digital innovation to focus also on digital transformation (Hinings et al. 2018; Vial 2019).

In sum, this PDW is concerned with questions at the crossroads between digital innovation and transformation across multiple levels of analysis, including individual, organization, and society. Digital transformation within an established organization pursuing digital innovation will likely involve large-scale change away from the hierarchy and a shift toward a more distributed and networked form of organization. By exploring how and why the new organizing logic of digital innovation impacts and transforms incumbent firms, the workshop addresses questions from four different areas: First, the PDW explores why the new logic of digital innovation triggers a digital transformation in incumbent firms. Second, it examines the drivers of this digital transformation in incumbent firms’ immediate environment, such as consumerization, democratization and new business logics. Third, the workshop is concerned with questions about how these drivers may under certain conditions alter the structure, strategy, culture, competencies, skills and technology platforms of incumbent firms. Finally, the PDW discusses and debates open questions on the trajectories of digital transformation journeys inside incumbent firms.

## **Digital Innovation at Incumbent Firms**

Much is known about the triggers, processes, and outcomes of digital innovation (Fichman et al. 2014; Nambisan et al. 2017) outside the boundaries and context of incumbent firms in established industries. Scholars across multiple disciplines have started to shed light on new ways of organizing, new business models, and a new generation of digital technology that in many ways has enabled and fueled these developments, without incumbent firms in established industries controlling much or any of them (Yoo et al. 2012). In turn, these new developments have started to put incumbent firms across a variety of traditional industries (e.g., media and entertainment, banking and finance, automotive, retail) under significant pressure to renew themselves as their external environment has started to be characterized by even greater velocity of change, uncertainty, complexity, and ambiguity than before.

Today, the phenomenon of digital innovation is no longer just associated with the “new” (new products and services including digital-first experiences, new business models including platform businesses, new enabling digital technologies, new ways of organizing such as crowdsourcing, etc.) that emerges outside the realm of influence, control and immediate relevance for incumbents in traditional industries. Instead, digital innovation is also associated with the “transformation” of the “old” (e.g., established hierarchical structures, established organizational cultures, established competencies and sets of enabling resources) inside incumbent firms as they embrace digital innovation (Svahn et al. 2017). In sum, digital innovation at incumbent firms means more than the emergence of “the new” that has been extensively studied over the past decade ever since the seminal research commentary on the “new” organizing logic of digital innovation was published (Yoo et al. 2010).

One useful metaphor, though certainly not the only one, to better understand this emerging topic of digital transformation and digital innovation at incumbent firms is what Prof. Michael Tushman from Harvard Business School once referred to in an interview as “the interface where Chandler meets Benkler.” Throughout three influential books, *Strategy and Structure* (1962), *The Visible Hand* (1977) and *Scale and Scope* (1990), Alfred Chandler (1918-2007) made significant contributions to the development of the theory of the industrial-age firm (Wilson and Toms 2012). Many firms today still follow the basic principles described in Chandler’s seminal works. On the other hand, in his work on ‘The Wealth of Networks – How Social Production Transforms Markets and Freedom’, Yochai Benkler describes the emergence of the networked information economy as the new epicenter of economic and social production (Benkler 2006). At the heart of this recent development is the democratization of access to digital technology, manifested in the advance of the Internet and pervasive networks, which has given rise to radically more decentralized patterns of nonmarket production in the information (e.g., financial services, software) and cultural (e.g., films, music) sectors.

Similarly, the rise of peer-to-peer, large-scale and collaborative forms of information and cultural production highlights new nonproprietary motivations and organizational forms that have been captured by Eric von Hippel’s notion of user-driven, democratized innovation (Chesbrough and Rosenbloom 2002; von Hippel 1978; von Hippel 2005). Underlying these fundamental shifts in social and economic production is the remarkable evolution of digital technology as described by IS scholars (e.g., Kallinikos et al. 2013). According to Benkler, an important consequence of this digital environment is enhanced autonomy, that is, the practical capacities of individuals to do more for and by themselves, in loose commonality with others, and without being constrained by traditional hierarchical models of social and economic organization. However, this viewpoint overlooks the fact that most individuals are members of formal organizations that operate within the market sphere. These organizations, typically also referred to as incumbents, operate according to the traditional logics of strategy and structure as explained, for example, by Alfred Chandler (Chandler 1962; Chandler 1977; Chandler 1990).

To date, we have very little understanding in the literature about the interface between the Chandlerian world of large incumbent organizations and the Benklerian networked world of new forms of organizing. We are, one could say, at the crossroads between digital innovation and digital transformation. Therefore, nearly 10 years after the seminal research commentary by Yoo et al. (2010), it is time for our field to pay more attention not only to the new organizing logic, but also how and why certain aspects of this new organizing logic drive changes and potentially a transformation of the structure, strategy, culture, competencies, skills, and technology platforms of incumbent firms in established industries.

## **Drivers of Digital Transformation**

A recent review of the emerging literature on digital transformation by Gregory Vial provides an initial integrative understanding of digital transformation (Vial 2019). This review and synthesis of knowledge that has been accumulated thus far is a useful point of departure for conducting further work at the intersection between digital innovation and IT-driven transformation of incumbent firms. In addition, early case study work in this emerging domain of research (e.g., Gregory et al. 2018) highlights some key drivers of digital transformation in the context of incumbent firms.

An underlying assumption of the following description of these transformation drivers is that incumbent firms tend to change along evolutionary pathways during times of environmental stability but may periodically carry out more revolutionary and fundamental organizational change during times of high

environmental velocity of change (Gersick 1991; Romanelli and Tushman 1994; Tushman and Anderson 1986; Tushman and Romanelli 1985). While this is certainly not the only existing perspective on organizational transformation and change (see van de Ven and Poole 1995), it is an established and widely adopted perspective in the existing literature. What follows from this perspective is the assumption that the digital transformation at incumbent firms will be to a large extent triggered and driven by factors that occur in the firm's immediate environment, putting these firms under pressure as they struggle to secure access to key resources they need for their survival. We discuss some of these external factors in the following paragraphs.

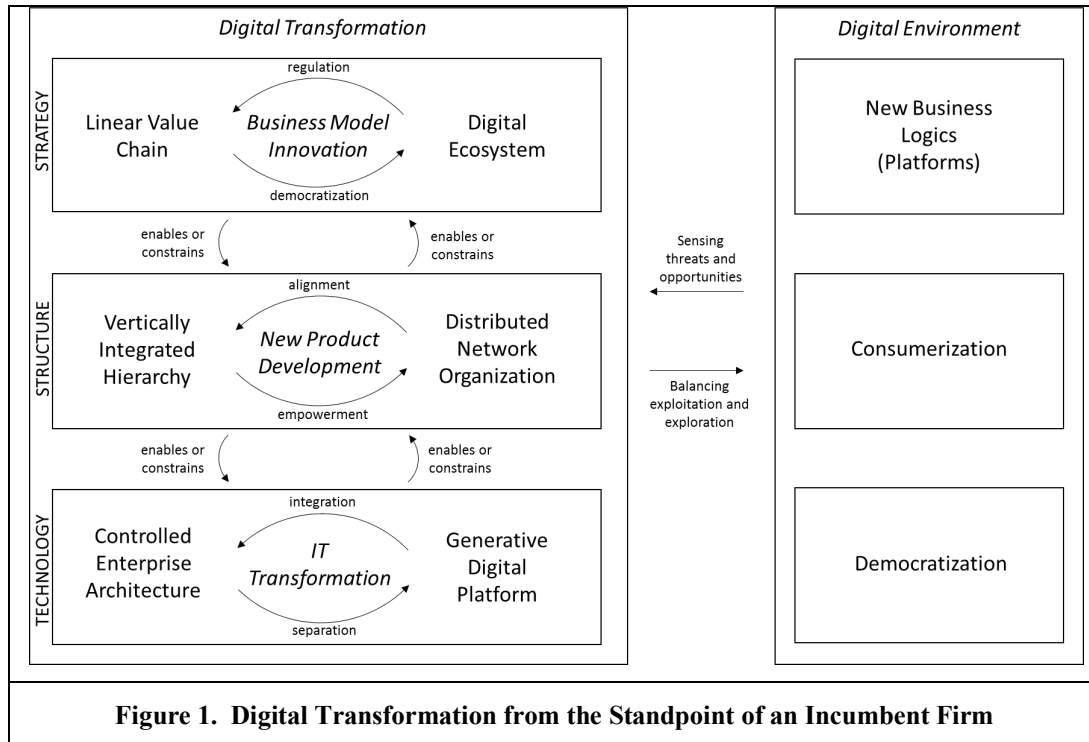
*Consumerization.* The widespread adoption of digital technologies across different parts of the society has produced the phenomenon of IT consumerization, defined as “the process whereby the changing practices and expectations of consumers, shaped by the wide adoption of digital technologies in everyday life, will influence the IT-related activities of workers and managers in organizations” (Gregory et al. 2018). In this context consumers can be consumer-workers who leverage digital technologies to perform their work or consumer-customers who have changing expectations regarding their interactions with the firm and the design of products and experiences. Both consumer-workers and consumer-customers play an important role in driving the digital transformation at incumbent firms, by demanding, co-creating, and driving digital innovation that ultimately challenges the existing elements of the incumbent firm, including its strategy, structure, culture, technology platform and so forth, potentially leading to their transformation. As Vial (2019) also finds in his literature review, changing consumer expectations and behaviors that are shaped by the diffusion and adoption of digital technologies are important drivers for digital transformation.

*Democratization.* Besides changing customer expectations and behaviors rooted in the consumerization phenomenon, incumbent firms in today's digital era are also confronted with a quickly changing competitive landscape as entry barriers have been significantly reduced. This has resulted in the rise of a greater number and diversity of startups, many of which have vast amounts of venture capital at their disposal further making access to new technology startups easier. The pervasiveness of digital infrastructures has given rise to what has been referred to as the networked information economy, enhancing autonomy and the practical capacity of individuals along multiple dimensions: (1) doing more for and by themselves; (2) doing more in loose commonality with others, without being constrained by traditional hierarchical models of organization; and (3) doing more even within formal organizations that leverage digital technology (Benkler 2006). Individuals are using their newly expanded practical freedom to act and cooperate with others in a variety of different ways, including new product development that is increasingly more distributed. An important technological development that has fueled the fast-paced changes in the competitive landscape of incumbents is the rise and diffusion of cloud computing, reducing significantly the upfront costs of setting up a new business, and allowing startups in the digital space to focus on software development and the end user experience that typically provides greater abilities for differentiation (Winkler and Brown 2013).

*New business logics.* From the perspective of an incumbent firm confronting digitalization, what adds on top of quickly changing customers and competition is the identified limitation of relying on old business logics, rooted in traditional product- and/or service-centered business models, for achieving future growth and expansion into new markets. In this context, platform business models previously known from born-digital players including Google, Apple, Facebook, Uber, Airbnb, and so forth, are providing fresh inspiration for transformation leaders at incumbent firms to reinvent or expand their business. For example, many large automotive manufacturers have embarked on a journey of digital transformation to turn their products into platforms for mobility services and experiences of different kinds (Svahn et al. 2017). However, platform businesses entail new logics that incumbent firms are just beginning to understand how to transfer and adapt them to their specific industry to make network effects and data network effects work. For example, GE has embarked on a large-scale transformation involving the development of Predix, an industrial internet platform, to drive disruptive change across its various business fields (Fitzgerald 2013). Concurrently, GE has also come to realize the limitations of rapid scaling in industrial business fields. The activation of network effects has been limited, among other factors, by the physical constraints of industrial products. Data network effects have also been difficult to activate as platform users and business clients of GE Predix have been hesitant to share and give away control of their data collected from their end customers and their connected things. Today, many regard the GE digital transformation case as a failure as the transfer and adaptation of platform business logics to the industrial B2B setting has been only partially successful.

## Focus of Digital Transformation

The focus of digital transformation at incumbent firms can be viewed from different angles, including but not limited to strategy, structure and technology. Figure 1 depicts a model that portrays digital transformation in an organizational context as a multi-layered phenomenon spanning organizational strategy, structure, and technology domains (Scott Morton 1991; Venkatraman 1994; Venkatraman 2017).



Digital transformation requires organizations to face tensions of organizational learning and strike a balance on all of the layers to effectively build upon and destroy the past to create the future (March 1991; Smith and Lewis 2011). The way in which this balancing act plays out on a given layer either enables or constrains the transformation on the upper and/or lower layer, highlighting the need for a holistic and general management approach to leading digital transformation initiatives that are oftentimes led by the CEO (Davenport and Westerman 2018) or newly established executive roles including CDOs (Tumbas et al. 2018). Leading digital transformation also involves embracing new logics of digital innovation, including new forms of digital technology-enabled organizing and new digital business models, which from the standpoint of an incumbent firm are perceived in terms of threats and opportunities (Benkler 2006; Nan and Tanriverdi 2017; Svahn et al. 2017).

Furthermore, digital transformation is an organization-wide phenomenon that envelops organizational members from across different divisions and functions. There are three areas of organizational activity in particular that play a central role in shaping the organization's overall digital transformation journey – business model innovation (involving changes in strategy), new product development (involving changes in structure), and IT transformation (involving changes in technology). At the heart of the digital transformation is a deep structural change, from the traditional hierarchy toward a more distributed and networked form of organization, where the hierarchy may still exist but is moved to the background.

The dominant organizational system in most established organizations is the hierarchy wherein organizing is achieved through the visible hand of management, work by individual employees is constrained by administrative procedures and formally defined work roles, and an authoritative system of order ensures that workers' activities are governed to be aligned with organizational goals and objectives (Chandler 1962; Chandler 1977). In any hierarchy, a particular set of stable routines, managerial expectations, and detailed knowledge is institutionalized, reinforced through a hierarchical structure characterized by clear

departmental boundaries, defined lines of authority, detailed reporting mechanisms, and formal procedures for organizational decision making (Powell 1990).

The primary concern of hierarchies is achieving economies of scale and scope in product development (Chandler 1990), which requires a stable product architecture and supporting knowledge. In particular, successful new product development requires two types of knowledge: (1) component knowledge, viz. knowledge of the core design concepts and their implementation in components, and (2) architectural knowledge, viz. knowledge of how components are integrated and linked together into a coherent whole (Henderson and Clark 1990). These two types of knowledge are deeply embedded in an organization's socio-technical structure including knowledge systems, processes and routines, and information technologies in use (Orlikowski 2000).

Digital innovation involves the carrying out of new combinations of digital and physical components to produce novel products, and transforming products through such digital innovation typically results in the emergence of the layered modular architecture with its loose coupling between components (Yoo et al. 2010). Thus, digital innovation represents a form of architectural innovation, which involves the reconfiguration of core design concepts and components, and results in the need to update architectural knowledge (Henderson and Clark 1990). Insofar as digital innovation may also involve radical innovation that overturns core design concepts, new component knowledge may also have to be developed (Henderson and Clark 1990). In either case, whether the pursuit of digital innovation within an established organization or institution destroys the usefulness of existing architectural knowledge only, or some existing component knowledge as well, the organization is confronted with an organizational learning problem: The need to build upon, as well as destroy, existing knowledge and supporting socio-technical structures to create the future (March 1991; O'Reilly and Tushman 2008; Smith and Lewis 2011).

The outcome of this digital transformation, if done effectively, is a newly established system of organizing and exchange that is aligned with the layered modular architecture of the transformed product system (Yoo et al. 2010). Studies of digital transformation in the media and entertainment industries show that waves of digital innovation (Boland et al. 2007) eventually lead to the emergence of loosely coupled systems or multisided platforms (Pagani 2013), both instances of a distributed networked organizational form. Applied to the context of organizing for digital innovation, activities of generating value connections on the same architectural product layer may preserve their own identity and take place in a physically and logically separated location of the organization (e.g., creating a new set of content for a connected car's infotainment systems versus reconfiguring loudspeakers and smartphone connectivity of the infotainment system on the device layer).

Loosely coupled activities also ensures that they are responsive to changes in the environment (e.g., replacing an infotainment system with a new generation of that technology, while preserving the bundles of content that are streamed onto that system) (Henfridsson et al. 2018). In sum, digital transformation within an established organization pursuing digital innovation will likely involve large-scale change away from the hierarchy and a shift toward a more distributed and networked form of organization. This structural change is oftentimes observed in the context of changes in the way new product development is organized and carried out. These changes are enabled and constrained by the transformation of the firm's enterprise architecture, previously fully controlled internally by the IT and business leaders, toward a more generative digital platform that allows for greater degrees of freedom and flexibility for innovation and change (Gregory et al. 2015). Furthermore, changes at the structural and technology layers interact with the changes at the strategy layer, where the digital transformation oftentimes manifests itself in terms of the shift from linear value chains toward digital ecosystems that result from platform-based business model innovation (Selander et al. 2013).

## **Trajectories of Digital Transformation**

The fundamental question of organizational transformation has been defined previously as "how organizations are transformed from one system of exchange to another" (Bacharach et al. 1996, p. 479). The transformation process itself has been conceptualized as either phyletic gradualism (a form of evolutionary system transition) or punctuated equilibrium (a form of revolutionary system transition) (Eldredge and Gould 1972). This evolutionary perspective is reflected in prior research on IT-enabled organizational transformation (Besson and Rowe 2012). According to the view of phyletic gradualism, the process of

transforming an organization proceeds along an even and slow pathway, involves large parts of the organization, and results in repurposing of existing organizational elements (e.g., an evolved set of skills and resources to deal with changed environmental conditions) (Eldredge and Gould 1972). An illustrative manifestation of this Darwinian perspective involving organizational metamorphosis in IS literature is Orlikowski's (1996) grounded theory of IT-based organizational transformation over time.

The punctuated equilibrium view, on the other hand, portrays the process of organizational transformation in terms of a rapid and episodic pathway, originating in a small sub-part of the organization, and resulting in a more radical reinvention of new organizational elements (Eldredge and Gould 1972). This more revolutionary perspective involving the dismantling and reestablishment of new deep structure (Gersick 1991) is empirically manifested in Gregory et al.'s (2018) grounded theory of punctuated consumerization-induced IT governance (i.e., deep structure) transformation involving the path-breaking transition from functional to platform-based governance.

An open question to be discussed and debated is how digital transformation unfolds, along which alternative pathways and trajectories. Applying the two perspectives of organizational transformation pathways, the phenomenon of digital transformation may involve an interplay of punctuated and evolutionary change that is internally enabled by IT but also driven by digital innovation originating in the outer environment and develops across traditional boundaries. As an example of this interplay, innovating with consumerized digital technology at lower organizational levels and at the organizational interface to the external environment typically produces a form of emergent and evolutionary organizational change (Jarvenpaa and Ives 1996). However, this ongoing longer-term process is infused with new momentum, urgency and energy for change through short-term bursts of punctuated change, for example the transformation of previously more centralized IT toward a more distributed and flexible platform for digital innovation (Gregory et al. 2015). Digital transformation is oftentimes referred to as an ongoing journey, because the type of IT-based organizational metamorphosis described above has no ending point, is continually fueled by digital technology change and adoption, and is periodically redirected as a result of fundamental internal changes (e.g., new digital business strategy, top leadership change, deep structure changes) that are carried out in response to fundamental changes in environmental conditions (e.g., legitimacy requirements in light on break-through technology, competition, customer, and regulation changes). This view of punctuated evolution is supported by recent empirical findings on the process of socio-technical transformation in the context of platform-based organization (Fischer and Baskerville 2018).

## Outlook

In sum, 10 years after the seminal research commentary on the logics of digital innovation (Yoo et al. 2010), we are currently starting to characterize what brings digital innovation and digital transformation research closer together. There is an abundance of examples that illustrate how incumbent firms across traditional industries are seeking to transform themselves and adapt to the new digital era. Much more empirical work and debates are needed to fully establish links between the new phenomenon of digital transformation and innovation.

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