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Digital Innovation and Organizational Culture

The case of a Danish media company

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Abstract. In this study, we investigate the relationship between organizational culture and digital innovation, with a particular focus on understanding firms' abilities to achieve a balance between stability and flexibility. On the background of an in-depth case study of the development of a digital news service in one of the largest media companies in Denmark, we rely on the widely used Competing Values Framework and the Organizational Culture Assessment Instrument to identify the dominant organizational culture as a basis for understanding the challenges of transforming the company by using digital technology to innovate existing product and service offerings. Our study shows that the digital news service and the emerging work practices associated with it were negatively influenced by an imbalance towards the control-oriented dominant culture of the company, leading to limited heterogeneity within the innovation network and the digital innovation processes. The article contributes to the body of knowledge on digital innovation by investigating how organizational culture influence a firm's ability to engage in digital innovation. Implications for both practitioners and researchers are discussed.

Key words: digital innovation, digital transformation, organizational culture, Competing Values Framework.

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1 Introduction

At the core of digital transformation, digital innovation enables firms to embed physical artifacts with digital components and transform analog products into digital services (Hinings et al. 2018; Yoo 2010; Yoo and Lyytinen 2010), thereby reshaping the structures, processes, and boundaries of the business landscape (Åkesson 2009). The success of digital innovation and business transformation efforts depends on a number of factors, in particular on an organization's ability to foster continuous development, implementation, and integration of digital innovation efforts. Studies show that a key organizational challenge is how to manage heterogeneity; i.e.; the socio-technical challenges of interorganizational collaboration, knowledge exchanges, diverse consumer groups, and heterogeneous user requirements (Lund 2014).

Only recently have researchers also begun to investigate the role of organizational culture in the context of digital innovation. For example, Lucas and Goh (2009) show that it was primarily a rigid and old-fashioned organizational culture, coupled with a largely bureaucratic structure, that hindered Kodak's ability to respond adequately to technological changes in the photography industry. Kodak, while being in a market-leader position, missed out on digitalization of the industry, which eventually triggered a downward spiral for the whole firm. Similarly, analyzing the business transformation of the car manufacturer Volvo, Svahn et al. (2017a) found that incumbent organizations have to carefully manage four competing concerns in order to develop a culture that supports digital innovation: innovation capability, innovation focus, innovation collaboration, and innovation governance. These studies show that organizational culture has a potentially critical influence on the success of digital innovation, warranting further investigation.

To gain a better understanding of the seemingly powerful—yet hard to conceptualize—role of culture in digital innovation, this article focuses on one specific aspect of organizational culture: a firm's ability to achieve a balance between stability and flexibility. This particular aspect that has been identified as a critical success factor for digital innovation due to the need to manage the increasing knowledge heterogeneity among actors without restricting the innovation space necessary for creativity and ideation (Svahn et al. 2017b; Yoo et al. 2008).

Earlier studies by Cameron and Quinn (2006) show that organizations whose culture is characterized by values of stability and control have more difficulty innovating than organizations characterized by flexibility and discretion. In the case of digital innovation, Yoo et al. (2010b) argue similarly that less control over innovation networks may lead to greater heterogeneity, which in turn leads to more innovative behavior. However, as documented in Lyytinen et al. (2016), this heterogeneity leads to uncertain

knowledge that needs translation, for example in an organizational context, in order to produce innovation. Innovation networks are therefore “socio-technical assemblages in which heterogeneous and uncertain knowledge is produced, transformed and stabilized. In such networks, innovations emerge through a series of generative processes that involve cognitive and social translation” (p. 67). Meanwhile, research has so far not explored how organizational culture influences these generative processes in innovation networks, and how it influences digital innovation. To address this knowledge gap, we pursue the following research question: *How does organizational culture influence a firm’s ability to engage in digital innovation?*

Consequently, this study aims to contribute to state-of-the-art knowledge, beyond recognizing that culture influences digital innovation, by improving our understanding of *how* a crucial aspect of culture—the balance between stability and flexibility—influences digital innovation. The empirical foundation for this research is one of the largest media companies in Denmark, *House of JP/Politiken* (JP for short). As part of the company’s digital transformation efforts, a digital news service called ‘Finance’ was developed. Finance aims to provide business people with financial news by combining serious journalism with an aesthetically pleasing, digital format. While digital news services are not new to the media industry, the development and implementation of Finance represented a radical change for JP by challenging the status quo in terms of value propositions, work routines and practices, and revenue streams in an otherwise traditional company. Thus, the case is an example of organizational change and adaptation in the context of digital transformation (West and Farr 1992). Using Cameron and Quinn’s (2006) Competing Values Framework to analyze and understand the organizational culture of JP, we investigate and discuss how it influences the digital innovation efforts associated with this change. Our analysis reveals that a top-down, control-oriented leadership approach was prevalent in the organization, which was at odds with employees’ preference for a working environment that stimulates them to share novel ideas and collaboratively explore their creativity. Building on these findings, we argue that a traditional, hierarchical culture may curtail a firm’s digital innovation processes and potentially represent an obstacle to a firm’s digital transformation. Digital innovation and business transformation require changes to traditional work practices (Marchand and Bochukova 2014; Hansen and Sia 2015), which have to be considered in the context of the dominant organizational culture. Hinings et al. (2018) call for future research on digital innovation in organizations, specifically novel digital organizational forms. A novel digital organizational form is defined as “a digitally-enabled arrangement of practices, structures, and values constituting an organization’s core that is appropriate in a given institutional context” (p. 54). Digital transformation of or-

ganizations is driven by disruption of, among other things, established business models and organizational processes, and it warrants studying how organizations cope with the challenges of radical change and “adopt novel digital institutional arrangements that are radical and transformational” (p. 59). We respond to this call by investigating how organizational culture influences a firm’s ability to engage in digital innovation. Specifically, we analyze and discuss the cultural challenges of managing emerging needs and work practices during digital innovation.

The remainder of the article is structured as follows: First, we provide an overview of the theoretical background in the literature on digital innovation and organizational culture. Second, we introduce our research and measurement design in the methods section. Third, the case setting of JP and the Finance project is described and an analysis of JP’s organizational culture profile is presented. Fourth, we analyze how the development and implementation of Finance was influenced by the dominant organizational culture at JP, with a specific focus on the balance between flexibility and control. Finally, we discuss implications for research and practice before concluding the article.

2 Theoretical background

2.1 Digital innovation

Digital innovation can be described as the embedding of digital components in physical products (Yoo et al. 2010a). Compared to traditional IT innovation, which focuses primarily on process innovation (Fichman et al. 2014; Swanson 1994), the digital innovation literature comprises digital product and service innovation (Yoo et al. 2010a), as well as digital business model innovation (Fichman et al. 2014; Teece 2010). Thus, the concept transcends the boundaries between product and service, process, and business model innovation. Digital innovation forces firms to “break away from established innovation paths” (Svahn et al. 2017a) and requires them to adapt their institutionalized thinking behavior (Lee and Berente 2012). Product and service as well as process innovation have been topics of interest within the IT innovation literature stream for many years (Yoo et al. 2010a), and recently, digital business model innovation (Teece 2010) has been added as a third dimension of digital innovation (Fichman et al. 2014).

The increasing digitalization of society leads to digital convergence (Yoo et al. 2012; Yoo and Lyytinen 2010), defined as “the unification of functions—the coming together of previously distinct products which employ digital technologies” (Yoffie 1997, p. 33). Through the integration of digital capabilities into physical artifacts, opportunities for

novel products and services are created based on the shared infrastructure of digital technologies (Yoo and Lyytinen 2010). Some of these opportunities arise on account of the generativity of digital technology, which can be defined as “a technology’s overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences” (Zittrain 2006, p. 1980). Recent studies show that digital convergence alters the perception of *digital product and service innovation* (Henfridsson et al. 2009, 2014; Lee and Berente 2012). This is particularly evident in the automotive industry, where the ability to, for example, embed digital devices such as in-car navigation and infotainment systems creates opportunities for automakers to engage in digital innovation (Svahn et al. 2017a; Yoo 2010).

Digital process innovations are “significantly new ... ways of doing things in an organizational setting that are embodied in or enabled by IT” (Fichman et al. 2014, p. 334). Consequently, organizational process changes or substitutions by digital technology are synonymous with digital process innovation. For example, through digitization of offshore petroleum production, enabled by sensor monitoring technology to allow computer support or automation, digital oil fields emerge (Østerlie 2012). In addition, digital process innovation transforms socio-technical systems by creating new work practices, as shown in various industries (Boland et al. 2007; Burtch et al. 2010; Yoo et al. 2006).

Digital business model innovation refers to “a significantly new way of creating and capturing business value that is embodied in or enabled by IT” (Fichman et al. 2014, p. 334). Today, many online companies base their pricing strategies on freemium business models, where the basic content or service is free to use and users are only charged for premium features. For example, Google and Facebook do not charge users for using their primary services but only for their premium services, such as analytics or advertising. Research has sought to quantify the value of these types of digital innovation in terms of indirect financial benefits based on the time spent on the services (Brynjolfsson and Oh 2012). Ellonen and Karhu, for example, identify non-measurable values such as “keeping the company on top of trends and market developments, communicating a modern image and learning more about the market, the customers and the competitors” (Ellonen and Karhu 2006, p. 92). Other organizations look to the external environment in attempts to create and capture business value through digital innovation by entering into relationships with new partners (Selander et al. 2010; Svahn and Henfridsson 2012). By integrating digital business processes across innovation ecosystems, new forms of digital innovation emerge (Rao and Jimenez 2011; Selander et al. 2010).

2.2 Organizational culture, control, and flexibility

For the purpose of this study, we rely on Cameron and Quinn's definition of organizational culture as "taken-for-granted values, underlying assumptions, expectations, collective memories, and definitions present in an organization. It represents 'how things are around here.' It reflects the prevailing ideology that people carry inside their heads. It conveys a sense of identity to employees, provides unwritten and often unspoken guidelines for how to get along in the organization, and it enhances the stability of the social system that they experience" (Cameron and Quinn 2006, p. 16). Furthermore, based on Schein (1991), we adopt a holistic understanding, incorporating artifacts, values, and assumptions into the conceptualization of organizational culture.

The ability to balance between flexibility and control is at the core of organizational culture and influences its ability to innovate. "Culture defines what the organization does, but it also defines what it cannot do, and in this respect can be a disability when confronting a new innovation" (Lucas and Goh 2009). In this regard, Svahn et al. (2017a) point to the need for adequate innovation governance; i.e.; the ability to achieve the right balance between control and flexibility. To support successful digital innovation processes, firms must "develop managerial practices and systems that recognize creativity and differentiation at the expense of prevailing authority structures and integration arrangements" (Svahn et al. 2017a, p. 240). Such practices and systems of governance are both shaping and shaped by a firm's culture and identity through a continuous, reciprocal process (Gioia and Patvardhan 2012). Cameron and Quinn (2006) use the case of Apple as an example of a business transformation and show that strategic priorities pivoted toward greater productivity and control at the expense of innovation when the former CEO of PepsiCo assumed control of the firm. As a result, the dominant organizational culture changed, and the firm lost its competitive edge (Porter 2001), resulting in fewer and less innovative products. It was not until the advent of the iPod—a digital innovation—that it made a turnaround. In the case of Volvo Cars, the firm realized early on that in order to leverage the opportunities afforded through digital transformation, "it would require shifts in the company's capabilities, routines, and structures in fundamental ways that would affect Volvo Cars' identity and culture" (Svahn et al. 2017a, p. 15). In particular, the traditional, contract-based culture of tight control that was exercised by Volvo's procurement department was at odds with the need for flexible supplier cooperation and co-creation in the establishment of an app ecosystem. By moving away from a transaction-cost approach, which emphasized strict contractual control over each transaction, toward a shared commitment of cost-neutrality and mutual liability, Volvo Cars was able to fully capitalize on the innovative potential of its app development initiative (Svahn et al. 2017a). However, especially in large

organizations with long histories, cultural values are often deeply rooted and resistant to change (Leidner and Kayworth 2006). While the case of Volvo tells a success story, Lucas and Goh (2009) use the case of Kodak to demonstrate negative effects of underestimating the role of culture in digital innovation. The management at Kodak failed to realize the complexity of organizational culture as a multi-level concept. Kodak's top management team was convinced of the necessary changes to develop Kodak into a high-tech firm, but the large pool of middle managers remained loyal to the traditional manufacturing logics, thereby largely impeding digital innovation efforts.

As these examples demonstrate, it is a timely and relevant problem for researchers as well as practitioners to address. Greater understanding of the influence of cultural aspects on a firm's ability to engage in digital innovation is needed.

3 Methods

To address our research question, we rely on a single case study design of a recent digital innovation project and how it was influenced by the dominant culture of the organization. Single case studies are appropriate when studying phenomena in actual social settings, where theoretical saturation has not yet been reached (Benbasat et al. 1987; Yin 2009). JP corresponds to the representative or typical case (Yin 2009) among companies facing the threat of digital disruption, which allows us to investigate the circumstances and conditions of a commonplace situation. According to Yin (2009), "the lessons learned from these cases are assumed to be informative about the experiences of the average person or institution" (p. 48). In terms of level of analysis, we focus on the dynamics of the innovation process rather than the outcomes of the process. In doing so, we hope to shed more light on the inner workings of digital innovation in practice, as called for by Yoo et al. (2010a).

Studying organizational culture is a complex undertaking, and we recognize that there are numerous different perspectives on how to conceptualize and assess culture. In light of the exploratory nature of our study and the goal of investigating the influence of organizational culture on a firm's ability to engage in digital innovation, we opted for a widely accepted organizational culture model. More specifically, we chose the Competing Values Framework (Cameron and Quinn 2006) for the purpose of establishing a culture profile of JP. The framework suits our needs for several reasons. First, its focus on organizational culture and change is well aligned with our investigating how organizational culture influences the case company's ability to engage in digital innovation, since digital innovation efforts presuppose organizational change and transformation (Svahn et al. 2017a, 2017b). Second, the dimensions and culture archetypes of the

framework support our in-depth analysis of the case company with regard to the challenge of achieving a balance between flexibility and control in response to the threat of digital disruption. Third, the assessment instrument accompanying the framework allows for efficient and reliable comparison of organizational culture profiles, which is helpful in comparing as is and to be culture profiles in the context of digital transformation.

In the following, we introduce the Competing Values Framework as our approach to understanding organizational culture, followed by an overview of our data collection approach, a step-by-step description of our data analysis, and an introduction to the case setting.

3.1 Competing values framework

The Competing Values Framework (Cameron and Quinn 2006) is two-dimensional, distinguishing between flexibility versus control and internal versus external orientation (Figure 1). The first dimension separates organizations that focus on stability

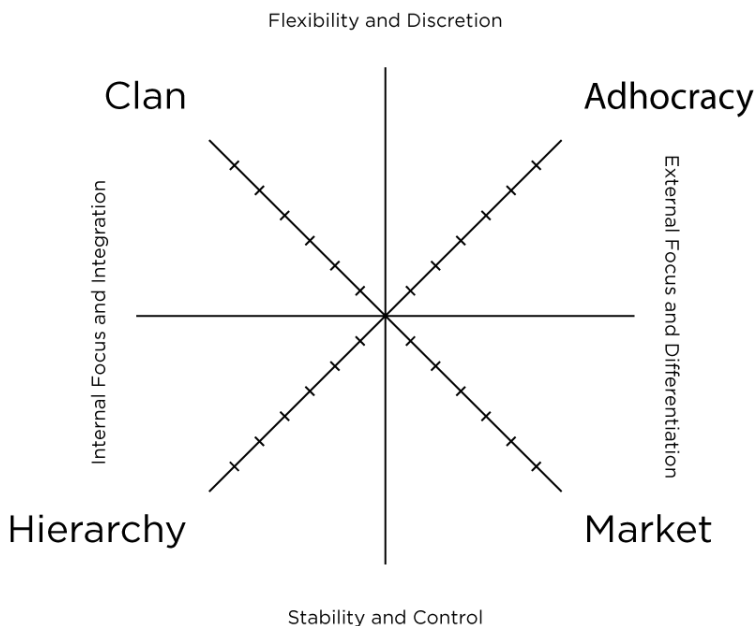


Figure 1. The four-dimensional space of organizational culture (Cameron and Quinn 2006)

and control of human behavior from organizations that value flexibility and employee discretion. The second dimension emphasizes that some organizations focus primarily on internal integration and unity, while other organizations are externally oriented, emphasizing differentiation and rivalry. When combined, the two dimensions form a four-dimensional space with each quadrant representing a culture archetype: Clan, Adhocracy, Market, and Hierarchy. This four-dimensional space is depicted in Figure 1. To empirically assess the culture profile of an organization, Cameron and Quinn have developed the Organizational Culture Assessment Instrument (OCAI). The assessment instrument draws on a survey to establish an overall culture profile of the organization and six individual profiles, focusing on specific organizational aspects: dominant characteristics, leadership, employee management, organizational glue, strategic emphasis, and criteria for success. Respondents rate the organization based on their perceptions of the current culture and how they would like to see it evolve over the next five years. This yields two separate culture profiles of the organization. The dominant culture type of an organization might, for example, be Market (50%), supported by Hierarchy (30%), but only marginally influenced by Clan (10%) and Adhocracy (10%). The OCAI and its application are briefly described in Appendix A.

According to Cameron and Quinn (2006), the reliability and validity of the OCAI have been tested and verified in numerous studies across thousands of organizations, and the “OCAI measures what it claims to measure, namely, key dimensions of organizational culture that have a significant impact on organizational and individual behavior” (Cameron and Quinn 2006, p. 160). Moreover, the assessment instrument has been used in several studies to analyze the influence of culture on, for example, software process improvement (Müller and Nielsen 2013) or the deployment of software processes (Shih and Huang 2010).

3.2 Data collection

Data were collected over a six-month period, beginning with a workshop at the case company in the fall of 2014 to discuss opportunities and challenges with regard to digital innovation. The subsequent data collection phase was based on a mixed-methods approach (Andersen 2013; Ghauri and Grønhaug 2010), including a quantitative survey using the OCAI. As supplement to the OCAI, we added open-ended questions of a more qualitative nature at the end of the survey, encouraging respondents to provide personal reflections on the organizational culture. Among these questions were *Describe in your own words the organizational culture?* and *To what extent is the organizational culture inhibiting or promoting innovation?* The majority of respondents answered these

questions, which provided us with valuable information about the organizational culture and the extent to which it is supportive of digital innovation and business transformation. Qualitative, semi-structured interviews with key employees were also included (Andersen 2013). Whereas the survey served as a means of analyzing the organizational culture, the interviews provided insights into the digital innovation processes, including the circumstances and conditions that influenced the development of Finance. Three of the authors took part in the primary data collection, whereas the fourth author was heavily involved in analyzing the data.

The survey was sent to all JP employees through the weekly newsletter, and the assessment instrument yielded 62 answers. This resulted in a response rate of 65 percent, which is considered acceptable (Lamers and Bremer 2015). For the purpose of data collection, the OCAI questions were imported into the web-based survey system SurveyXact and distributed through the weekly internal newsletter within the organization. We adhered to established guidelines for testing (Andersen 2013), which entailed three rounds of survey evaluation with academic test subjects as well as employees from JP. Based on their feedback, we modified the questionnaire to make the questions easier to understand and the survey faster to complete. This process continued until the feedback from test subjects was predominantly positive (Ghauri and Grønhaug 2010).

Five interviews were conducted at the premises of JP and lasted approximately one hour. Following Ghauri and Grønhaug (2010), we established an interview guide for the semi-structured interviews based on acquired knowledge from the literature review. The first part of the interviews focused on the interviewee's role and the organizational culture, and the second part dealt with the process of digital innovation. The questions in the third and last part of the interviews were based on theoretical concepts in the literature; e.g.; modularity and digital innovation; and served to relate the experiences of the interviewees to the challenges and opportunities of digital innovation identified by extant research. Interviewees included the media director, the editor in chief, an editor, a journalist, and a project manager. Given the interviewees' different positions in the organizational hierarchy, the interviews covered both managerial and employee perspectives. All interviewees were involved in the Finance project. The interviews were digitally recorded, transcribed, and imported into NVivo for further data analysis (Welsh 2002).

When referencing the empirical data, we refer to the respondent/informant by role irrespective of whether the statement is taken from the survey or interview data; e.g.; editor in chief, JP. Although more than one person can occupy some of the same roles; e.g.; journalist; we know to which person the quotation belongs. This serves to make

the text reader-friendly and protect the anonymity of common employees who voiced critical opinions.

3.3 Data analysis

For the purpose of ensuring rigor and comprehensiveness, we analyzed the quantitative data through a three-step process. First, as prescribed by Cameron and Quinn (2006), we calculated average scores for each cultural perspective (A = Clan, B = Adhocracy, C = Market, and D = Hierarchy) as a basis for establishing current and preferred organizational profiles of JP (see Appendix A for details). Second, we segmented the data based on age, seniority, division, and job description. Finally, we analyzed the cultural congruence; i.e., consistency in terms of cultural values; across the six organizational aspects measured by the OCAI to examine the degree of alignment between the different facets of JP's culture. As proposed by Cameron and Quinn (2006), patterns across the culture profiles were visually inspected. To that end, we drew on answers to the open-ended questions encouraging respondents to share their personal insights and perspectives on the organizational culture and its influence on digital innovation processes.

The qualitative data; i.e., the transcribed interviews and answers to the open-ended survey questions; were coded and divided into themes according to the culture archetypes of the Competing Values Framework and the digital innovation categories identified through the literature review. Both the literature and the qualitative data were coded using the qualitative data analysis software NVivo, which allowed for in-depth literature-based analysis. The analysis was performed in three stages. In stage one, we coded the qualitative data according to culture archetype (Clan, Adhocracy, Market, and Hierarchy). For example, expressions articulating a top-down management perspective were coded under Hierarchy. In stage two, we coded the data according to the categories of the digital innovation literature, e.g., 'process innovation' and 'socio-materiality' (see Appendix B for an overview of codes). In stage three, we revisited our coding, merging similar codes into compound codes. Using data triangulation (Andersen 2013; Ghauri and Grønhaug 2010), both the results that were consistent and inconsistent with the quantitative data were analyzed in depth thematically to ensure reliable findings.

4 The Jutland Post and the Finance Project

In this and the following section, we present our analysis of how the organizational culture of JP influenced the company's ability to engage in digital innovation. The case

study focuses on the ‘Finance project’ as an example of a digital innovation, and we provide an analysis of the organizational culture of the company as a basis for understanding the challenges facing the project. We therefore first present an overview of the case and a culture profile of the company.

4.1 Case overview

JP has decades of experience publishing newspapers in Denmark. The morning newspaper *The Jutland Post* dates back to 1871, and the company has been one of the market leaders within the news industry in Denmark for several decades. According to the media director of JP, the cornerstone of the newspaper has always been quality journalism in the form of independent, fact-checked stories of contemporary events that are reported accurately (media director, JP).

The newspaper has undergone several transformations through the years, from a provincial four-page edition to a nationwide multi-section newspaper with hundreds of thousands of daily readers. In October 2014, the online news service Finance was launched in response to development trends within the media industry as well as changing customer needs and news consumption patterns.

The development of Finance is illustrative of the cultural challenges of the business transformation associated with what we refer to as digital innovation processes. JP’s long history of publishing printed newspapers notwithstanding, Finance was developed with a focus on digital rather than physical attributes of the newspaper. The Head of Digital Design of JP describes the Finance project in a newspaper article (see Birkholm and Hansen 2015):

The vision behind Finance is to give the busy business people insight and overview of the business and economy of today, presenting in-depth journalism in innovative and user-friendly digital formats. ... Finance has developed various editorial formats to make the overall vision come through.

Interestingly, our analysis shows that Finance cannot easily be categorized as digital product, process, or business model innovation, but that aspects of its development and implementation span across these boundaries established in the literature. As a *product innovation*, the news service exhibits the seven properties of digital materiality by Yoo (2010)—see Table 1. From a *process innovation* perspective, Finance would radically alter the work practices of journalists as the frequency of deadlines increased and the work pace accelerated (Åkesson 2009; Yoo and Lyytinen 2010). This includes

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<i>Digital characteristics (Yoo, 2010)</i>	<i>Description</i>	<i>Physical newspaper</i>	<i>Digital newspaper Finance</i>
<i>Programmable</i>	Possibility of embedding software capabilities to allow multiple functions and increase malleability	Not possible	Finance is itself a software artifact that can be programmed and adapted to contain different functionalities
<i>Addressable</i>	Each digital artifact can be uniquely identified and addressed in a computing architecture	Each newspaper item is an interchangeable hard copy and cannot be uniquely identified or addressed	Finance and each of its elements; i.e.; articles; have a unique identifier that can be addressed (and therefore also programmed)
<i>Senseable</i>	Equipped to collect information	Not possible	Finance can utilize the underlying hardware on which it runs to collect user information; i.e.; reading time, speed, preferred content, etc.
<i>Communicable</i>	Equipped to communicate with actors and other artifacts	Not possible	Finance can interact and communicate with the reader based on their needs and preferences; i.e.; inform about relevant breaking news and allow commenting on articles.
<i>Memorable</i>	Ability to memorize usage behavior	Readers can use traditional, physical bookmarks	Finance can store user profiles, their preferences, and interact accordingly
<i>Traceable</i>	Ability to trace usage behavior and interaction patterns	Not possible	Finance can trace (and store) user behavior in detail, such as preferred type or length of content, categories of mostly read articles, type of reading device, etc.
<i>Associable</i>	Ability to associate with related elements such as actors, artifacts, places	Not possible	Content becomes associable through the use of tags in articles and comments

Table 1: Digital characteristics of Finance

a transition from normal working hours with an evening deadline to rolling deadlines, as well as changes to the socio-technical system related to employees' interaction with publishing and editorial systems. As a result, working with Finance requires new technical skills and knowledge; e.g.; graphics software. While not revolutionary at the time of introduction, Finance can also be seen as an example of digital *business model innovation* in the context of The Jutland Post. Finance is based on a digital first mindset, which runs contrary to that of printed newspaper production: “We wished to evolve from being a newspaper—and from thinking like a newspaper—to being a digital and more modern media company” (media director, JP). The new business model relies on new distribution channels, many of which are digital media platforms. Finance allows readers to access media content on digital platforms through the freemium model; i.e.; some articles are available for free while others are placed behind a paywall for subscribers, changing not only the traditional value proposition but also revenue streams.

4.2 Dominant culture at JP

The results of our OCAI analysis show that JP's culture is dominated by the Market (32%) culture type, supported by Hierarchy (26%), but only marginally influenced by Clan (21%) and Adhocracy (20%). Although the profile seems rather balanced upon visual inspection, Market dominates by virtue of being the culture type that has the highest score, which—generally speaking—“indicates the culture that tends to be emphasized most in [the] organization ... It identifies the basic assumptions, styles, and values that predominate” (Cameron and Quinn 2006, p. 71). The current profile (solid line in Figure 2) indicates that the culture is characterized by stability and control. However, the preferred culture (dotted line in Figure 2) differs markedly, emphasizing flexibility and discretion with Clan (31%) and Adhocracy (30%) values dominating in comparison to Hierarchy (17%) and Market (21%).

Based on its current profile, JP is best described as a result-oriented organization dominated by a leadership approach that, according to Cameron and Quinn (2006), is hard driving, competitive, goal oriented, and focused on day-to-day activities. The value drivers of the organization are market share, goal achievement, and profitability. Underpinned by the Hierarchy culture type, organizational goals are achieved through control measures and by monitoring productivity and profitability. Meanwhile, the preferred culture is characterized by collaboration, motivational leadership focused on mentoring, and a working environment that fosters high-performance teamwork and encourages employees to excel and develop their skills. The survey shows that the em-

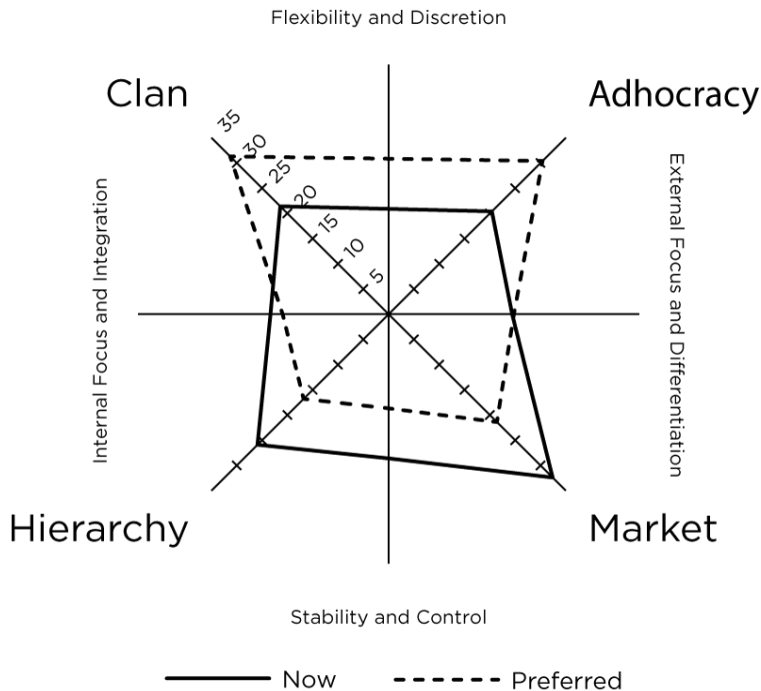


Figure 2. Organizational culture profiles of JP

employees prefer a working environment that stimulates them to share novel ideas and collaboratively explore their creativity. In such a working environment, innovation and agility are key values (Cameron and Quinn 2006).

According to Cameron and Quinn (2006), differences between culture profiles greater than 10 percentage points are of special interest when analyzing OCAI results, because they are indicative of cultural tensions. Our analysis shows differences of 9-11 percentage points between culture types when comparing the current and preferred profiles. The incongruence is most visible with regard to the Market culture type, revealing a difference of 11 percentage points.

The employees' responses to the open-ended survey questions contribute to an understanding of the organizational culture profiles of JP, including the cultural tensions. One journalist describes it as

... a very top-down culture. It can be frustrating seeing a person making all the decisions—also in areas where the person is not skilled. I wish management would listen more to the professionally trained people, because they have oth-

er competences than management. When we have to do new things that seem senseless, the answer is frequently: ‘Because the boss says so’ (journalist, JP).

Another journalist adds:

Many of my colleagues are wary of management. They see the newspaper as old fashioned, top-down managed, and they are afraid of taking chances and running risks, because they fear getting slapped by management if the project fails (journalist, JP).

Our analysis of JP reveals a culture with many facets. In the words of one software developer,

... the organization is characterized by being old and new at the same time. It is evident that it is an old organization with proud traditions, deeply rooted practices, visible hierarchies, and a hint of pecking order—old people making the decisions. At the same time, it is shaken by the pace of development, and the organization has realized that it cannot rest on its laurels (software developer, JP).

The digital sales manager adds that

... the culture is hard and soft at the same time and therefore complex. On the one hand, it is evidently founded on values and norms reflecting a very competitive, innovative, and result-oriented mindset. On the other hand, it is also based on empathy where people look out for one another, help each other, and an awareness of the importance of the community in ensuring well-being and success. There is a conflict between a top-down managed organization and the high degrees of freedom accorded the individual employee (digital sales manager, JP).

5 Control and flexibility in the Finance Project

In this section, we first present an analysis of the Finance project with regard to the development process and leadership approach taken before describing the consequences and results of the project. Our analysis shows that the development was characterized by a strong tendency for top-down decision-making by a closed team of managers, thwarting challenges to their control-oriented leadership approach. As a direct conse-

quence, this approach led to numerous negative outcomes. Various employees (journalists, developers) voiced their frustration over not being heard or included in the design of Finance and argued that JP missed out on the full innovative potential of the project. This lack of involvement led to lowered productivity due to inappropriately designed work processes, eventually requiring an extensive redesign of said processes to set up the right workflow and governance structures for employees working with Finance.

5.1 Development process

From a process perspective, the Finance project can be separated in two stages: development and implementation. In both stages, top management kept tight control of decisions made with regard to functionality and design of the solution, and—while occasionally encouraging participation—rejected ideas that would challenge their pre-conceived plans. Finance started as a skunkworks project in 2011 and was officially launched in 2014. The editor in chief explains the history behind the project:

It was back in 2008 that we shared preliminary thoughts in the editorial team ... in which direction should JP go. In the business section, we started talking about the prospect of having a digital niche site, and in 2012-13 we settled on the need for a digital medium (editor in chief, JP).

Finance was envisioned as a true digital-first media. It was the brainchild of the media director who describes it as a management-led project—a joint effort between two people:

I remember one day—at the City Hall Square office—I went into Steen’s office and said: ‘Why don’t we make the grand plan and see what happens?’ [...] Steen took care of the journalistic product and I was responsible for the business model (media director, JP).

In terms of implementation, the organization was restructured around the digital news service in the wake of the project. In other words, the project had consequences for how work was organized at the company: “He [Steen] has really made it as a digital product. [...] It is really a disruption. Or at least it is a reengineering effort” (media director, JP). This reengineering effort around the previously mentioned digital first mindset led to the hiring of approximately 20 people who were tasked with implementing the plans behind Finance. There was “a sense of urgency that is prevalent in the entire industry”

(media director, JP). Specifically, 20 new journalists were hired and added to the pool of 40 business reporters which together comprised the editorial staff of Finance.

Top-down approach. During the development stage, a small, closed group of JP managers was responsible for developing the concept behind Finance. Top management defined the project strategy and decided on the goals in a top-down fashion with very limited information flowing outside of the management team. According to the project manager, the idea behind Finance was documented in a vision, and he was responsible for translating and implementing it together with his team. They worked in secrecy for the first eight months and met monthly with the editor in chief and other senior managers to discuss and hammer out the functionality and design details.

The blueprint for the digital news service was drawn up by the editor in chief before the Finance project was transferred to the development department:

The way it was created was that I spent an entire Christmas vacation ... scribbling and looking through colors and fonts ... and then I presented some things ... to our designers in the development department, and I said 'I would like these colors and these functions' ... That ended up being the basic structure (editor in chief, JP).

During the implementation stage, when the service was encoded in software, the media director and editor in chief had a predefined road map with specific content and design requirements, which precluded an iterative and inclusive approach that would take the ideas and experiences of the developers into consideration. In this way, management dictated what the news service should contain, how to present it online, and how the pricing model would be set up.

In both stages of the development of Finance, top management decided on the outcome before presenting the roadmap to the other stakeholders, including the journalists who would have to work with Finance and the software engineers implementing the software.

Moreover, to prepare for the novel way of working with Finance in contrast to a traditional newspaper, management designed and implemented the future work processes based on their assumptions of reality, rather than seeking input from employees engaged in the actual practices and working with the relevant systems on a daily basis.

Lack of inclusion and rejection of ideas. The participating editor recalls experiences with several development processes where employees were encouraged to participate

in brainstorming about the future newspaper but where top management in reality had settled on the end design beforehand. Management rhetoric about inclusion hid the reality of top-down management, which was harmful to progress and innovation. According to the editor,

If we put aside the trade secret perspective, which is the primary reason we kept it a secret project, we could have involved more employees in the process. I will say, however, that it has happened many times that employees have been asked about their opinion where the input has not been used afterward. The story then becomes: ‘The answer is given beforehand. Those are provided by the editorial office. We are just being asked, so they can say we have been heard, although they are already sitting on the final product’. (editor, JP).

Whenever the implementation plan was challenged, management stuck to their result-oriented focus on the original plan, unwilling to listen to improvement proposals from employees. Interestingly, some employees nevertheless tried to push the organization toward greater flexibility regarding the development process, for example through the suggestion of alternative pricing models in contrast to the separate freemium and premium model that management preferred. These attempts were, however, not successful, and employees’ ideas did for the most part not find their way into the development process. One of the interviewed journalists describes his frustration with this process as follows: “The design is outlined from the top, and then it is about following orders down through the ranks” (journalist, JP).

The few employees who were occasionally consulted ventured to suggest improvements to the news service and its associated work processes, but these suggestions were rejected with reference to management’s predefined road map:

It is all well and good that there are so many specific demands made of the project, but this also poses a bit of a challenge when the demands prove difficult to realize and the leadership is unwilling to change its mind (journalist, JP).

5.2 Project outcomes

Frustration among employees. The lack of openness in the decision process led to frustrations among employees, as is evident in the following statement by one employee involved in the project:

It is reflected in the atmosphere and people's morale, having to focus on deadlines and not taking any risks, rather than getting the time, tools, and opportunities to create a better product, which we know we can (developer, JP).

Some employees directly linked their frustration over not being involved to the overall culture of the company, with one journalist highlighting that JP's culture is often

... old-fashioned, excessively hierarchical, and result-oriented, with too much focus on the long-suffering printed product, and not enough focus on development, innovation, and on preparing the workers for a new type of media (journalist, JP).

Another employee added:

House of JP/Politiken does not have an organizational culture that welcomes input. It is a supertanker with everybody following a backward-looking board of directors. It is almost impossible to get innovative ideas across. [...] There is a lot of talk about digital transformation but it is evident that [management] has not understood the severity of the situation. They have not understood what it takes to transform the company to a modern media house. [...] I see no vision for the future. They think in variations of what we already have (software developer, JP).

The strongly hierarchical approach led to widespread dissatisfaction, especially among innovative employees:

As an employee in the IT department, it can be very frustrating that technical decisions, which we are experts in, often have to be approved by persons in the management who do not have enough knowledge to make the decision and who do not have the time needed to include the persons who possess the needed knowledge (developer, JP).

Limited realization of innovative potential. The control-oriented leadership approach of JP's management team toward the development of Finance, grounded in the result-oriented and hierarchical culture of JP, arguably restricted the flexibility, knowledge heterogeneity, and diversity of the innovation network; i.e.; the actors and stakeholders involved in the innovation process (Yoo et al. 2010b).

One journalist pointed to the adverse effects of relying too much on a controlled process when aiming for creativity

Result-oriented contracts and production targets have no place in a creative company. If the employees do not produce as much as perhaps they ought to do, this method is sure to narrow their scope, as opposed to stimulating and enhancing the creative environment. The process then becomes more of a sweatshop than the creative workshop it ought to be. If the aim is to fill out a few pages, the approach might work, but it will not generate any new developments (journalist, JP).

In the views of various employees, the missing creative freedom and lack of involvement of people outside the management team in the development of Finance hindered the realization of the full innovative potential.

Lowered productivity and need for process redesign. The top-down approach not only influenced the development of Finance but also the process innovation of new, digital work routines required for the newly developed product. As employees were largely excluded from participation, new work practices emerging as part of the digital innovation were not consistent with daily production routines. Previously, work processes had been separated by tasks and roles (research, writing articles, taking photographs, editing, etc.). However, Finance required employees with broader job profiles that were expected to be able to work across this traditional division of labor. The editor in chief noted that

... people have become less productive because of additional work tasks. Now, they edit the stories themselves, they have to find pictures themselves, etc. Previously, this was something the editorial assistants did. So, it is fair to say that they have to do more themselves today (editor in chief, JP).

The processes had to be changed radically after the launch of Finance, because they were not consistent with the actual needs of people working with the system. According to the editor, the change in news medium resulted in big challenges.

It has resulted in a totally new organization of the news desk. We have underestimated the whole workflow and governance structures, and we have been lacking the tools to make it effective (editor, JP).

New work processes were not designed alongside the news service. There was an insufficient focus on process development.

We settled on a model from the start before we went ‘on air,’ which quickly showed us that it was more complicated in reality and then required a number of adjustments while we were up and running (editor, JP).

6 Discussion and implications

Numerous studies show that flexibility, openness, and access to a diversity of knowledge are key factors influencing the process and outcome of digital innovation (Lund 2014; Rao and Jimenez 2011; Selander et al. 2010; Yoo and Lyytinen 2010). At the same time, firms must strive to “maintain acceptable control over value appropriation” (Svahn et al. 2017a) during new developments (Boudreau 2010). When organizations succeed to balance these competing goals of flexibility and control of innovation processes, the heterogeneity of innovation networks increases and the full potential of digital innovation processes can be realized (Yoo et al. 2010b). In the case of JP, the dominant culture types, Market and Hierarchy, impeded the organization’s ability to balance flexibility and control, and thus restricted the creative potential of the digital innovation processes. However, in contrast to Volvo Cars, where management engaged in a continuous negotiation between new opportunities and established practices (Svahn et al. 2017a), JP failed to break free of their traditional, hierarchical culture. Instead of facilitating a balanced approach that would allow for the inclusion of ideas within certain boundaries, JP’s management team stuck to their preconceived decisions and pushed the project forward according to their ideas. The use of digital technology to innovate product and service offerings was tightly controlled by top-down management, leading to limited heterogeneity within the innovation network and the digital innovation processes. This is in line with prior research (Rao and Jimenez 2011; Selander et al. 2010; Yoo and Lyytinen 2010). Subsequently, this resulted in digital innovation efforts that were ill-aligned with everyday work practices and led to frustration and lowered productivity within the organization.

In our case presentation, we describe the digital characteristics of Finance by drawing on Yoo (2010). It not only serves to argue why Finance is a digital innovation but also forms the basis for the ensuing analysis of employees’ novel way of working with the digital news service in contrast to a traditional newspaper. We show how JP’s organizational culture influenced the company’s ability to engage in digital innovation by

analyzing the challenges associated with the control-oriented leadership approach to innovation and lack of project involvement of people outside the management team. The digital nature of Finance; e.g., due to it being “programmable” and “communicable” (Yoo 2010); altered the work practices of journalists as the frequency of deadlines increased and the work pace accelerated (Åkesson 2009; Yoo and Lyytinen 2010). However, because JP’s management team stuck to their preconceived plans and pushed the project forward according to their ideas, processes had to be changed radically after the launch of Finance. They were not consistent with the actual needs of people working. Consequently, our case study shows not only the implications of digital innovation and business transformation, in this case the transformation of a traditional newspaper to a digital news service, for work practices, but more importantly how the organizational culture influences a firm’s ability to engage in digital innovation. The results show that the organizational culture influences the leadership approach to digital innovation (control-oriented in the case of JP), which in turn results in certain challenges (incompatibility of existing work practices with the digital news service in the case of JP). Thus, we respond to call for future research into novel digital organizational forms and how organizations cope with the challenges of radical change (Hinings et al. 2018). Our study suggests, firstly, that managers need to understand that organizational culture influences the management style and approach to digital innovation, which may challenge business transformation efforts due to; e.g.; preconceived plans and emerging needs and work practices. Secondly, our study highlights the need for future research into the cultural challenges of managing these needs and work practices that emerge during digital innovation projects on account of the generativity of the underlying technology (Zittrain 2006). We link these insights to the following summary of contributions and implications for practice.

In summary, through our in-depth case study of one of the largest media companies in Denmark, we contribute to an understanding of *how* organizational culture influences a firm’s ability to engage in digital innovation. By demonstrating how the dominant organizational culture profile limited creative flexibility and knowledge heterogeneity within the innovation network, our study furthers extant research in two ways. First, we describe characteristics of organizational culture as opportunities for and challenges in digital innovation. Our case study shows that a top-down, control-oriented leadership approach to digital innovation, which is at odds with the preferred organizational culture, may stifle creativity, limiting the innovativeness of the end result and potentially even create adverse effects, such as lowered productivity. Second, by answering Yoo et al.’s (2010a) call for empirically grounded research on cultural “antecedents and consequences of digital innovations” (Yoo and Lyytinen 2010: 29), we provide new

insights into the complex interplay between organizational culture and digital innovation. Due to the multifaceted nature of Finance, we show that cultural aspects not only play a role in product and service development but influence all aspects of digital innovation across the traditional boundaries of product, process, and business model. Future research is, however, needed to investigate the cultural challenges of managing emerging needs and work practices during digital innovation projects characterized by high degrees of generativity.

Based on these insights, we suggest the following three implications for practice. First, organizations should regularly consider whether to engage in or respond to digital innovation in order to sustain or achieve competitive advantage on the market (Porter 2001). Transforming a firm is both time-consuming and challenging. Top management resolve and strategizing is therefore needed when change is required in the face of digital disruption (Lucas and Goh 2009). Second, we suggest that organizations may benefit from establishing current and preferred culture profiles based on theOCAI and using the Competing Values Framework to analyze the gap and determine how it influences their ability to innovate (Cameron and Quinn 2006). Whereas the current profile outlines the basis for digital innovation, the preferred profile shows the conditions for culture change in support of innovation efforts. In the case of JP, the profiles reveal a tension between the current top-down management culture and the preferred culture of involvement and participation. By establishing both profiles, senior management is better able to decide on appropriate actions in changing the organizational culture as part of efforts to transform the firm through digital innovation. Third, managers should take stock of the profiles to understand how the organizational culture influences their management style and approach to digital innovation, which in turn may challenge business transformation efforts. As a consequence, we propose that organizations develop a plan for organizational culture change in which their digital innovation and business transformation efforts draw on current value drivers in realizing the preferred profile (Cameron and Quinn 2006). Such a plan could, for example, build on the guidelines by Müller et al. (2014), as they help managers decide on appropriate tactics given the values and assumptions of both the current and future (envisioned outcome of; e.g.; digital innovation and business transformation efforts) organizational culture profiles. As our case study shows, without an understanding of the cultural implications of digital innovation and appropriate planning to manage the associated cultural challenges, organizations are ill-equipped to leverage the opportunities and avoid the obstacles of organizational change.

7 Conclusion, limitations, and future research

Through a case study of the development of the digital news service Finance, this paper provides insights into how a firm's ability to engage in digital innovation is influenced by the dominant organizational culture. In particular, we show that a result- and control-oriented culture may be detrimental to the digital innovation processes of an organization, as it limits the firm's ability to successfully manage the competing concerns between control and flexibility in the innovation processes. Our findings are not only firmly grounded in extant literature on digital innovation but the direct outcome of an in-depth case study that employs a mixed-methods approach to data. Drawing on the Competing Values Framework and the Organizational Culture Assessment Instrument, we establish and analyze the current and preferred culture profiles of the organization. Supplemented by qualitative interviews, our analysis enables us to describe how the organizational culture influenced digital innovation at the company.

We acknowledge the limitations of our study. While an in-depth, single case study provides valuable insight into the influence of organizational culture on digital innovation, we encourage future research to extend this line of research, for example multiple case studies that allow for comparative analyses and provide basis for theorizing. Moreover, due to the difficulty of conceptualizing and assessing organizational culture, the use of the Competing Values Framework carries with it the risk of methodological bias that limits the generalizability of our results. Thus, we encourage future research to apply different methods and analytical frameworks to validate and extend our research.

References

- Åkesson, M., (2009). Digital innovation in the value networks of newspapers. *Gothenburg Studies in Informatics* (8225): 1-58.
- Andersen, I., (2013). *Den skinbarlige virkelighed—Vidensproduktion i samfundsvidenskaberne, Samfundslitteratur*, 5. udgave., Frederiksberg C.
- Benbasat, I., Goldstein, D., and Mead, M., (1987). The case research strategy in studies of information systems. *MIS Quarterly* (11): 369-386.
- Birkholm, L., and Hansen, K., (2015). Building a new business brand. *SNDS Magazine*: 14-17. Retrieved from https://issuu.com/snds_magazine/docs/sndsmag_1_2015_web

- Boland, R., Lyytinen, K., and Yoo, Y., (2007). Wakes of innovation in project networks: The case of digital 3-D representations in architecture, engineering, and construction, *Organization Science* (18:4): 631-647.
- Boudreau, K., (2010). Open platform strategies and innovation: Granting access vs. devolving control. *Management Science* (56:10): 1849-1872.
- Brynjolfsson, E., and Oh, J., (2012). The attention economy: Measuring the value of free digital services on the internet. *International Conference on Information Systems, ICIS 2012* (4): 3243-3261.
- Burtch, G., Weiss, A., and Yoo, Y., (2010). Digital innovation and craftsmanship: The case of C.F. Martin & Company. *Thirty First International Conference on Information Systems, St. Louis*: 1-9.
- Cameron, K., and Quinn, R., (2006). *Diagnosing and Changing Organizational Culture: Based on The Competing Values Framework*, Jossey-Bass, San Francisco.
- Ellonen, H., and Karhu, P., (2006). Always the little brother? Digital-product innovation in the media sector. *International Journal of Innovation and Technology Management* (03:01): 83-105.
- Fichman, R., Dos Santos, B., and Zheng, Z., (2014). Digital innovation as a fundamental and powerful concept in the information systems curriculum. *MIS Quarterly* (38:2): 329-A15.
- Ghuri, P., and Grønhaug, K., (2010). *Research Methods in Business Studies: A Practical Guide* (4th ed.). Pearson Education Limited.
- Gioia, D., and Patvardhan, S., (2012). Identity as process and flow. *Constructing Identity in and Around Organizations* (2): 50-62.
- Hansen, R., and Sia, S., (2015). Hummel's digital transformation toward omnichannel retailing: Key lessons learned. *MIS Quarterly Executive* (14:2): 51-66.

- Henfridsson, O., Mathiassen, L., and Svahn, F., (2014). Managing technological change in the digital age: The role of architectural frames. *Journal of Information Technology* (29:1): 27-43.
- Henfridsson, O., Yoo, Y., and Svahn, F., (2009). Path creation in digital innovation: A multi-layered dialectics perspective. *Working Papers on Information Systems* (9:2009): 1-26.
- Hinings, B., Gegenhuber, T., and Greenwood, R., (2018). Digital innovation and transformation: An institutional perspective. *Information and Organization* (28:1): 52-61.
- Lamers, M., and Bremer, M., (2015). OCAI Online—Frequently Asked Questions. Retrieved from <https://www.ocai-online.com/ocai/faq>
- Lee, J., and Berente, N., (2012). Digital innovation and the division of innovative labor: Digital controls in the automotive industry. *Organization Science* (23:5): 1428-1447.
- Leidner, D., and Kayworth, T., (2006). A review of culture in information systems research: Toward a theory of information technology culture conflict. *MIS Quarterly* (30:2): 357-399.
- Lucas, H., and Goh, J., (2009). Disruptive technology: How Kodak missed the digital photography revolution. *Journal of Strategic Information Systems* (18:1): 46-55.
- Lund, J. (2014). Activities to address challenges in digital innovation. *IFIP Advances in Information and Communication Technology* (446): 115-131.
- Lyytinen, K., Yoo, Y., and Boland, R., (2016). Digital product innovation within four classes of innovation networks. *Information Systems Journal* (26:1): 47-75.
- Marchand, D., and Bochukova, P., (2014). Digital transformation at Novartis to improve customer engagement. *IMD case 3-2437*: 1-22.
- Müller, S., and Nielsen, P., (2013). Competing values in software process improvement: A study of cultural profiles, *Information Technology & People* (26:2): 146-171.

- Müller, S., Ulrich, F., and Nielsen, P., (2014). When process is getting in the way of creativity and innovation. In *Proceedings of the 47th Hawaii International Conference on System Sciences*, IEEE, pp. 221-229.
- Østerlie, T., (2012). Co-materialization: Digital innovation dynamics in the offshore petroleum industry. *IFIP Advances in Information and Communication Technology* (389:AICT): 108-122.
- Porter, M., (2001). Strategy and the Internet. *Harvard Business Review* (79): 62-78.
- Rao, B., and Jimenez, B., (2011). A comparative analysis of digital innovation ecosystems. In: *Proceedings of PICMET 11: Technology Management in the Energy-Smart World (PICMET)*, IEEE, pp. 1-12.
- Schein, E., (1991). What is culture? In: *Reframing Organizational Culture*, P. Frost, L. Moore, M. Louis, C. Lundberg and J. Martin (eds). SAGE Publications, pp. 243-254.
- Selander, L., Henfridsson, O., and Svahn, F., (2010). Transforming ecosystem relationships in digital innovation. In: *Proceedings of the 31st International Conference on Information Systems, AIS*, pp. 1-15.
- Shih, C.-C., and Huang, S.-J., (2010). Exploring the relationship between organizational culture and software process improvement deployment. *Information & Management* (47): 271-281.
- Svahn, F., and Henfridsson, O. (2012). The dual regimes of digital innovation management. In: *Proceedings of the 45th Hawaii International Conference on System Sciences*, IEEE, pp. 3347-3356.
- Svahn, F., Mathiassen, L., and Lindgren, R., (2017a). Embracing digital innovation in incumbent firms: How Volvo Cars managed competing concerns. *MIS Quarterly* (41:1): 239-253.
- Svahn, F., Mathiassen, L., Lindgren, R., and Kane, G., (2017b). Mastering the digital innovation challenge. *MIT Sloan Management Review* (58:3): 13-16.

- Swanson, E., (1994). Information systems among innovation organizations. *Management Science* (40:9): 1069-1092.
- Teece, D., (2010). Business models, business strategy and innovation. *Long Range Planning* (43:2-3): 172-194.
- Welsh, E., (2002). Dealing with data: Using NVivo in the qualitative data analysis process. *Forum: Qualitative Social Research (FQS)* (3:2): 1-9.
- West, M., and Farr, J. (1992). Innovation and creativity at work: Psychological and organizational strategies. *Administrative Science Quarterly* (37:4): 679-681.
- Yin, R., (2017). *Case Study Research and Applications: Design and Methods*, Sage Publications, Los Angeles.
- Yoffie, D., (1997). Competition in the age of digital convergence. *California Management Review* (36:4): 1-53.
- Yoo, Y., (2010). Computing in everyday life: A call for research on experimental computing. *MIS Quarterly* (37:2): 357-370.
- Yoo, Y., Boland, R., and Lyytinen, K., (2006). From organization design to organization designing. *Organization Science* (17:2): 215-229.
- Yoo, Y., Boland, R., Lyytinen, K., and Majchrzak, A., (2012). Organizing for innovation in the digitized world. *Organization Science* (23:5): 1398-1408.
- Yoo, Y., Henfridsson, O., and Lyytinen, K., (2010a). The new organizing logic of digital innovation: An agenda for information systems research. *Information Systems Research* (21:4): 724-735.
- Yoo, Y., and Lyytinen, K., (2010). The next wave of digital innovation: Opportunities and challenges: A report on the research workshop 'Digital challenges in innovation research.' *SSRN 1622170*: 1-37.

- Yoo, Y., Lyytinen, K., and Boland, R., (2008). Distributed innovation in classes of networks. In: *Proceedings of the 41st Hawaii International Conference on System Sciences*, IEEE, pp. 1-9.
- Yoo, Y., Lyytinen, K., Thummadi, V., and Weiss, A., (2010b). Unbounded innovation with digitalization: A case of digital camera. *Annual Meeting of the Academy of Management*: 1-41.
- Zittrain, J., (2006). The Generative Internet. *Harvard Law Review* (119:7): 1974-2040.

Appendix A

The Organizational Culture Assessment Instrument (OCAI) is a survey-based approach to establishing organizational culture profiles. The survey contains six questions that each have four alternative answers (see Table A.1).

For each question, the respondent is asked to divide 100 points among the alternative answers. Percentages are calculated based on summary scores, which reflect the relative importance of each culture type. These percentages are illustrated in a culture profile chart (see Figure A.1).

The calculation follows simple guidelines: All 'A' responses are added together and divided by six (corresponding to the total number of questions) in order to arrive at an average score. Average scores for B, C, and D are calculated in a similar fashion. Each of the average scores corresponds to a culture archetype (A = Clan; B = Adhocracy; C = Market; D = Hierarchy).

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1.	Dominant Characteristics	Now
A	The organization is a very personal place. It is like an extended family. People seem to share a lot of themselves.	
B	The organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.	
C	The organization is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented.	
D	The organization is a very controlled and structured place. Formal procedures generally govern what people do.	
	Total	100
2.	Organizational Leadership	Now
A	The leadership in the organization is generally considered to exemplify mentoring, facilitating, or nurturing.	
B	The leadership in the organization is generally considered to exemplify entrepreneurship, innovation, or risk taking.	
C	The leadership in the organization is generally considered to exemplify a no-nonsense, aggressive, results-oriented focus.	
D	The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.	
	Total	100
3.	Management of Employees	Now
A	The management style in the organization is characterized by teamwork, consensus, and participation	
B	The management style in the organization is characterized by individual risk taking, innovation, freedom, and uniqueness.	
C	The management style in the organization is characterized by hard-driven competitiveness, high demands, and achievement.	
D	The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.	
	Total	100
4.	Organization Glue	Now
A	The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high.	
B	The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.	
C	The glue that holds the organization together is the emphasis on achievement and goal accomplishment.	
D	The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important.	
	Total	100
5.	Strategic Emphasis	Now
A	The organization emphasizes human development. High trust, openness, and participation persist.	
B	The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.	
C	The organization emphasizes competitive actions and achievements. Hitting stretch targets and winning in the marketplace are dominant.	
D	The organization emphasizes permanence and stability. Efficiency, control, and smooth operations are important.	
	Total	100
6.	Criteria of Success	Now
A	The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people.	
B	The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator.	
C	The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key.	
D	The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling, and low-cost production are critical.	
	Total	100

Table A.1. The OCAI Survey (Cameron and Quinn 2006)

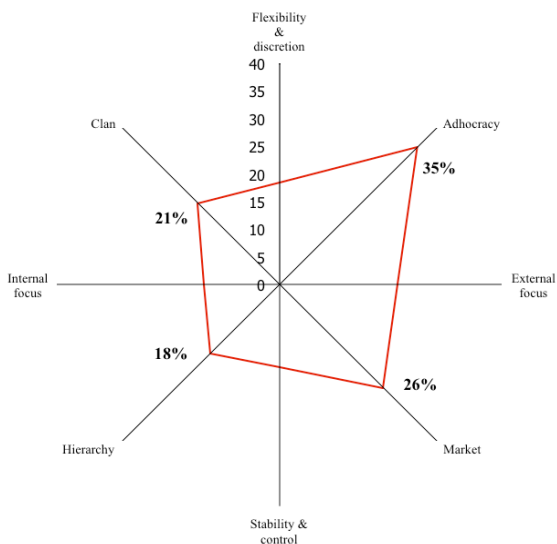


Figure A.1. Example Culture Profile Chart

Appendix B

Figure B.1 provides a visual overview of the codes used during the second stage of data analysis. The codes are derived from a review of extant literature on digital innovation.

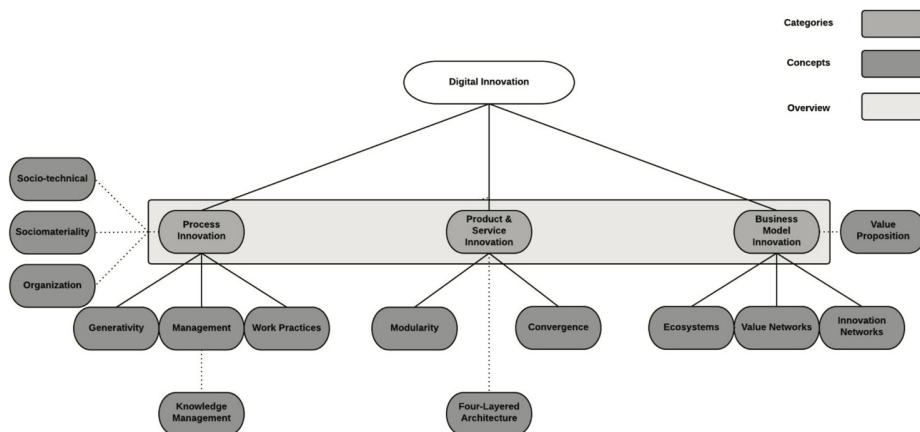


Figure B. 1. Coding Tree