5-15-2019

DIGITAL STRATEGY FORMATION: FOSTERING NEW INSTITUTIONAL WORK PRACTICES

Taline Jadaan
Gothenburg University, taline.jadaan@umu.se

DIGITAL STRATEGY FORMATION: FOSTERING NEW INSTITUTIONAL WORK PRACTICES

Research paper

Jadaan, Taline, Gothenburg University, Applied IT, Gothenburg, Sweden, taline.jadaan@ait.gu.se

Abstract

Pervasive digitalization is challenging established organizational modes of operating and practices in strategy formation. Both theoretical and empirical accounts detail how such processes involve moving from perceived views of information technologies as important but functional resources used to achieve business goals, towards digital strategy grounded in a synthesized perspective where strategies for organizational goals are both formed and executed by leveraging digital resources. While multiple studies detail the underlying rationales for this shift, and what a digital strategy is how such strategies are formed has received less attention. We draw on the notion of planned and emergent strategy formation to analyze how the distributed agency and blurred boundaries induced by digitization are harmonized with organizational governance requirements. We contribute an empirical account of strategizing across three phases identified in an interpretative case study of a digital strategy formation process at the Swedish Transport Administration (STA), marked by distinct approaches to balance and integrate business and digital competencies. Second, we identify distinct work practices aimed at creating new institutional arrangements in the three phases. Third, the analysis demonstrates the cumulative nature of digital strategy formation and how organizations may develop capacity for strategizing over time.

Keywords: Digital strategy, Digital strategy formation, Institutional work, Strategizing

1 Introduction

The increasing reliance on digital technologies in organizational activities challenges dominant perspectives on the role of IT in organizational strategies. As processes, products and services are being embedded with (and in) digital technologies, established organizational configurations, boundaries and modes of operating are contested (Nambisan et al., 2017). This calls for a reconsideration involving a shift from perceiving IT strategy as a subordinate function aligned to business strategy towards digital strategy—"organizational strategy formulated and executed by leveraging digital resources to create differential value" (Bharadwaj et al., 2013, p. 472). The need for digital strategy is driven by exponential technological capacity improvements, digitization of information, and digitalization—"the sociotechnical process of applying digitizing techniques to broader social and institutional contexts that render digital technologies infrastructural" (Tilson et al., 2010, p. 725). Thus, effects of digitalization on the scope and scale of strategy, speed of decision-making, and sources of value creation, challenge organizations to engage in new types of strategy formation processes (Bharadwaj et al. 2013).

Research on digital strategies suggests that they differ from traditional IT strategies in at least two important ways—the role of digital technologies and the central actors in their formation and realization (El Sawy et al., 2010; Peppard et al., 2014; Sandberg, 2014). First, the ubiquity and capacity improvements of digital resources have significantly elevated their importance in organizational decision-making, and value creation and capture processes. As products and services become highly reliant on digital technologies, organizations' digital resources, exogenous technological innovations, and competitive moves in the business landscape enabled by new digital resource generation and combina-

tion, become increasingly crucial strategic considerations (Woodard et al., 2013). In seeking and evaluating innovation options, digital resources are essential enablers and boundary conditions that form, and are formed, in combination with other strategic considerations, rather than being retrospectively aligned. Second, digitalization blurs boundaries in organizations' spatial and temporal structures, and demarcations between processes and outcomes (Nambisan et al., 2017; Parker et al., 2017), causing distribution of agency and intensifying dynamics in strategy formation processes (Peppard et al., 2014; Marabelli and Galliers, 2017). In environments with complex and quickly changing internal and external relationships, attempting to optimize organizational systems' performance through careful consideration of the current competitive landscape will not be very fruitful (Tanriverdi et al., 2010). Instead, adapting to change through reconfiguration and renewal are critical organizational abilities. Thus, to explore and exploit opportunities associated with digitalization, organizations need to intertwine planned coordination and emergent strategizing processes (Mintzberg, 1994). Considering the blurring of boundaries, we suggest that digitalization tilts this relationship by increasing the relevance of emergent strategies arising from micro-level organizational practices.

Previous work has provided important insights regarding what a digital strategy is and why it is needed (e.g. Bharadwaj et al., 2013; Kane et al., 2015). In terms of strategy formation, a focal concern for studies of micro-level practices is the turbulence of business environments related to demand uncertainty and technological discontinuity (El Sawy et al., 2010). However, the dynamics of change processes in which planned and emergent strategy formation intertwine, and underlying work practices through which strategies materialize, have received little attention. In particular, although empirical studies emphasize that initiatives anchored in technical materiality arising from sub-communities might resist and change planned central initiatives (Baptista et al., 2010; Aanestad and Blegind Jensen, 2011), the processes through which institutional arrangements shape and are re-shaped by digital strategy formation processes have received scant attention. As digitalization affects not only external but also internal boundaries, the interactions between macro- and micro-level processes in the endogenous environment in which strategy formation occurs (and change is implemented) are likely to fundamentally affect organizational outcomes. Thus, we focus here on the dynamic processes through which organizationally initiated digital strategy formation processes spark practices that lead to organizational level change. To analyze such processes, we draw on the concept of institutional work—"*the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions*" (Lawrence and Suddaby, 2006, p. 216), which highlights how institutional contexts influence actors actions, intentions, and rationality.

Using this conceptual lens, we address the following research question: *How do organizations foster institutional work practices for digital strategy formation?* As well as considering relevant previous insights, we present a longitudinal case study, conducted over two years, of a digital strategy formation process at the Swedish Transport Administration (STA). Drawing on theory of institutional work to illuminate the process, we consider both the actors and activities involved and how the dichotomy between planned and emergent strategy was managed in practice. We identify three distinct phases in the strategy formation process, in which the organization built increasing capacity for balancing planned and emergent strategizing actions. We thereby contribute an empirical account of the orchestration of tensions between planned and emergent strategy formation in institutional work practices. Specifically, our analysis highlights the role of configurations in steering, generating and selecting emergent candidate focus areas in the strategy formation process.

2 Related Research

2.1 Digital strategy

Typical IT strategy formation processes have dramatically changed in recent years, from *ad hoc* bottom-up approaches through top-down IS planning approaches, strategic planning of information systems (IS) and IS capability, to (most recently) digital strategizing (Peppard et al., 2014; Marabelli and Galliers, 2017). The main distinguishing characteristics of these approaches are related to the role of

IT in organizations' business strategy and the changing nature of actors involved. Naturally, the shifts in approaches have coincided with developments in technological capacity and the importance of IT in business operations. Recently, scholars and practitioners have argued for a need to reconsider IT strategy formation processes to reflect the extensive digitalization of contemporary business processes. Such arguments for reconsideration focus, particularly, on a fusion of IT strategy and business strategy, grounded in the assumption that they are inseparable (Bharadwaj et al., 2013; Peppard et al., 2014). As digital technologies are increasingly embedded in processes, products and services, business strategies (e.g. in terms of marketing, supply chains, and human resources) without digital components are becoming increasingly scarce. Essentially, the extensive digitalization of operations impacts the nature, role, and development of strategic thinking.

Bharadwaj et al. (2013) identify four aspects of strategic thinking that are deeply affected by the fusion of IT and business—scope, scale, speed and sources of value creation. In this context, scope refers to the activities carried out within an organization and the resultant products and services. An internally important characteristic of digital strategy is that it transcends functional structures (e.g. logistics, operations, sales, IT) as it is transfunctional. The design, implementation, and use of contemporary digital resources are not easily (or efficiently) restricted by organizational structures. Digitalization also challenges established structures in the external business landscape as it reduces transaction costs, facilitates unbundling, and enables firms to leverage established customers when entering new niches, as illustrated (for example) by Airbnb, Uber and Apple Music, respectively (Skog et al., 2018).

For physical products, scale is deeply connected to material production investments, for instance in expensive machinery. Costs of generating digital products strongly differ (for example costs of replicating software are often negligible), but scale remains a strategic consideration (Bharadwaj et al., 2013). Requirements for scaling up and down according to demand are typically related to digital strategies. Information abundance and new connectivity capacity suggest size-related advantages, and alliances and partnerships are essential for creating advantages from scale. Digital strategy is also subject to rapid change, so speed an important aspect. In particular, requirements for speed in product launches, decision-making, supply chain orchestration, and network formation and adaptation increase as the playing field is digitalized. Finally, the sources of value creation and capture are affected. Information becomes increasingly valuable, and abundant, underlining the importance of balancing distinct revenue models (as illustrated, for example, by newspapers). Leveraging multisided business models (i.e. developing a platform), which often involves some coordination of business models in networks, has proven a recipe for success for many firms in recent decades.

2.2 Digital strategy formation

Digital strategy formation here refers to a process of goal-directed activity intended to realize a digital strategy (c.f. Karpovsky et al., 2013). Profound digitalization has been shown to challenge established organizational capabilities, strategic logics, and organizational boundaries (Nambisan et al., 2017; Parker et al., 2017; Svahn et al., 2017). In terms of organizational boundaries regarding strategic processes, digitalization has two salient effects—less bounded outcomes and processes, and less predefinition of agency (Nambisan, 2016). First, in terms of outcomes and processes, the blurring of boundaries is associated with both outcomes such as products and services (for example functionality, scope, and customers) and spatial and temporal boundaries of processes (for example, locations and times that activities are carried out, and actors affected). The separation of form from function and contents from medium (Yoo et al., 2010) enables greater flexibility and distribution of control as digital artifacts are "transient assemblies of functions, information items, or components spread over information infrastructures" (Kallinikos et al., 2013, p. 360). Separations also mean that information systems, products, and services are inherently incomplete, as functions and value connections continue to change after release and implementation (Garud et al., 2008; Yoo et al., 2012). Thus, boundaries between phases of digital strategy formation processes are blurry. Second, digitalization distributes the locus of agency in strategy formation processes by involving a larger, less stable and more diverse set of actors in organizational activities (Lyytinen et al., 2016). As boundaries within organizations re-

garding information processing, operations and outcomes are blurred by new technology and methods for integration and collaboration, new interactions and dependencies among actors are likely to arise (Henfridsson et al., 2014). Similarly, digital technologies enable value-creating activities that encompass and involve dynamic sets of external actors engaging in collective activities and with varying degrees of decision rights over the design of digital resources (Tiwana et al., 2010; Henfridsson et al., 2018). Additionally, as the external environment becomes subject to more rapid and unpredictable change (El Sawy et al., 2010; Tanriverdi et al., 2010), organizations need to hold options for multiple contingencies and capacity to adapt rather than simply ability to execute plans efficiently (Sambamurthy et al., 2003; Pavlou and El Sawy, 2011).

To understand effects of less bounded outcomes and processes, and less predefinition of agency in digital strategy formation processes, we draw on Mintzberg's (1978) conceptualization of realized strategy as the result of both deliberately planned and emergent patterns of action. The literature on strategy generally, and IS strategy particularly, has emphasized the role of managerial planning in, for example, aligning IS strategy to business strategy. Within strategy research, scholars have stressed that strategy is something organizations *do* (i.e. strategizing) rather than *have* (Jarzabkowski and Spee, 2009). The digital resources and practices that develop though this activity may gain high strategic importance (sometimes gradually and sometimes explosively). Therefore, attention has been paid to how digitally enabled micro-strategizing ''processes and practices which constitute the day-to-day activities of organizational life and which relate to strategic outcomes''(Johnson et al., 2003, p. 3) generate macro-level outcomes. Accordingly, we consider digital strategy formation processes as including both top-level planning activities, and the practices whereby a large heterogeneous set of actors both within and outside organizations generate new potentially strategically important alternatives ('emergent candidates') through their digitally-mediated practice (Henfridsson and Lind, 2014). To analyze the organizational practices underlying such digital strategy formation processes, we apply the lens of institutional work.

2.3 Institutional work

To investigate the digital strategy formation process we review theory on institutions, particularly the concept of institutional work. This stresses the multitude of intermingled daily occurrences of agency intended to reshape the current institutional order, which are full of contradictions and unintended consequences (Lawrence et al., 2011). We consider institutions as consisting of *"cultured-cognitive, normative and regulative elements that ... provide stability and meaning to social life ... Institutions are transmitted by various types of carriers, including symbolic systems, relational systems, routines, and artifacts' and they 'operate at multiple levels of jurisdiction"*. Previous studies on the role of institutional work practices in digitally enabled strategic change have explored the roles of external and internal practices in legitimacy and identity work (Gawer and Phillips, 2013). They have also highlighted the role of digital innovation in organizational forms, infrastructures and digital institutional building blocks (Hinings et al., 2018), and suggested that transformation of an IT unit involves institutional work reshaping the institutional foundation (rules, norms, and meanings) (Guillemette et al., 2017). However, none of these studies address the role of institutional work in digital strategy formation processes.

In a review of the literature on institutional work, Lawrence and Suddaby (2006) identify nine forms of work practices carried out by individuals with the aim to create new institutional arrangements. These work practices are path-dependent and cumulative because they occur in contexts shaped by historical events and previous institutional work (David, 1994). They may target one or more of several distinct categories of institutional characteristics—rules, norms and belief systems, and abstract categories of meanings. Work aimed at creating rules involves vesting, defining and advocacy. Advocacy here refers to explicit and conscious political and/or regulatory actions carried out by influencing, lobbying, and allocating recourses, to mobilize support and forces that lead to persuasion. *Defining* refers to building configurations of networks or sets of 'constitutive rules' (Scott, 2001) that offer status and generate identity. *Vesting* involves the creation of rule structures that confer property rights.

Work aimed at creating new norms and belief systems involves constructing identities, changing norms, and constructing normative networks. *Constructing identities* refers to transforming and creating new identities and community feeling between individuals and the institutions they operate in. *Normative associations* are changed by restructuring moral and cultural relations that underpin established practices. *Changing normative networks* refers to the construction of new sanctioned institutional structures and activities that work in parallel with existing structures and activities through 'inter-organizational connections' among loose coalitions or a diverse group of actors.

Changes in abstract categories of meanings involve mimicry, theorizing and educating. *Mimicry* occurs when actors try to retain similarities to old institutionalized practices in new practices, or harmonize them, to facilitate implementation. *Theorizing* is "the development and specification of abstract categories of chains of cause and effect" (Greenwood et al., 2002, p. 60). Essential points in this type of work are naming and storytelling during the creation of new institutions (Kitchener, 2002). *Educating* refers to increasing relevant actors' knowledge and abilities regarding novel practices associated with the new institution. In sum, these concepts provide a rudimentary conceptual framework (Miles and Huberman, 1994) that offers a sensitizing device for formulating theory.

3 Method

This paper is based on an interpretative case study (Walsham, 2006), conducted between November 2014 and January 2016, to elucidate a digital strategy formation process at STA. We followed this process as *involved researchers* (Walsham, 2006; Pan and Tan, 2011) from initiation until finalization of the digital strategy. After reviewing literature on IS-strategy, digital strategy, and institutional work, we engaged in post-discovery exploration (Charmaz, 2006) of the digital strategy formation process.

3.1 Research context

STA is a governmental agency responsible for all long-term planning of railroad, road, sea, and air transport infrastructure, as well as for building, operating and maintaining public roads and railroads in Sweden. It is an institution with strict boundaries, hierarchically organized and managed through bureaucracies and structured in organizational silos. The organization has approximately 6800 employees, based at the headquarter in central Sweden and six regional offices. In recent years the nature of STA has shifted from a traditional infrastructure provider to a service-oriented collaborating partner in Swedish society, with a mission to facilitate the provision and maintenance of an efficient transport network with long-term sustainability. This shift, particularly the increasing focus on services, has been accompanied by an increased focus on digital technology and growing need for an appropriate digital strategy. We followed the work carried out during the digital strategy formation process at STA between November 2014 and January 2016. One of the authors was invited as a participant observer to follow the process. The first author made numerous on-site visits, interviews (44 in total), and interactions (through phone and Skype meetings). During this period, three digital strategy formation projects were initiated in tandem, which are briefly outlined in the following paragraphs:

Strat-one (November 2014- January 2015): The first project was aimed at leveraging external digital competency through a top-down approach. It was managed and coordinated by a globally leading external consultancy firm. Specific goals were to clarify the key characteristics of digitalization, identify how digitalization would affect the organization in the short-, medium- and long-term, and identify important building blocks for constructing a digital strategy. Representatives of top management, the CIO, and the IT division manager (CFIT), were tasked with creating a focus group (referred to as Strat-one). The aim of the focus group was to function as a sounding board during the project phase and help to decide directions of the study and consider outcomes. It consisted of eight employees of the organization: the manager of the IT department, unit manager at the concern architecture, five IT strategists, and one business developer.

Strat-two (February 2015 – June 2015): Strat-two was intended to involve more stakeholders and match organizational needs with technological potential, through a bottom-up approach. This was a

follow-up project, aimed to involve internal actors (management and grassroots) in the process. The idea was to educate and increase knowledge and awareness of pervasive digitalization and identify daily operational challenges that could be ameliorated by digitalization. Strat-two included initiation of a research project, ITUT, focusing on *"How digitalization would improve the daily operational tasks of the employees at STA"*. To inspire and challenge (mis)conceptions about digitalization, the ITUT project arranged a two-day seminar called "Our digital future" with 13 presenters from research institutes, universities, and industry. The seminar aimed to increase the digital competence of STA employees by presenting relevant digitalization research and projects that had a bearing on STA and related industry. The ITUT project also included market analysis on the role of pervasive digitalization in relation to STA. The group consisted of a digital director, three IT-strategists, two business developers, a service developer, a business strategist, and the unit manager at CA the concern architecture.

Strat-three (August 2015 – June 2016): The Strat-three project was intended to verify the relevance of, and aggregate, candidate focus areas, via iterations between micro- and macro-level considerations of digital strategy. It focused on consolidating and extending findings from Strat-one and Strat-two with employees from different units and levels within the organization through workshops. In addition, a new research project, called DOI, was initiated to enhance the ability to identify challenging operational tasks where digitalization could act as a catalyst, form clusters of employees from different units within the organization who could address these challenges, and design projects accordingly. The group consisted of a digital director, three IT-strategists, two business developers, a service developer, a business strategist, and the unit manager at the concern architecture.

3.2 Data collection

Data were collected in three phases between November 2014 and June 2016 from three types of sources: semi-structured interviews, participant observations, and secondary data sources (Walsham, 2006, Pan and Tan 2011). During the Strat-one project, we participated in three workshops, a board of directors meeting, and work carried out by the consultancy firm. We also interviewed eight respondents (all internal participants listed above) involved in the focus group. During the second phase, February 2015 to June 2015, views of all 12 participants in Strat-two (the internal participants listed above, a member of the board of directors, and two additional business developers) were elicited, individually, in semi-structured interviews. In addition, we attended three project meetings, two workshops, and conducted several informal interviews during the two-day seminar (entitled "Our digital future") with representatives of both STA and associated industries. The aims of these project meetings were to examine and analyze feedback from the market analysis, and the investigation carried out within the organization. A first draft of a digital strategy was formulated in April 2015, and revised in June 2015. Phase three (August 2015 – Jan 2016) focused on developing the digital strategy in an emergent strategizing manner, identifying, verifying, and deepening understanding of the operational challenges in the organization and developing related operational projects that could be leveraged through digitalization. During this phase we conducted 23 interviews, several informal interviews, and attended three project meetings, five workshops, and one division managers meeting.

All 44 interviews were recorded and later transcribed, generating 31.5 hours of recorded material, approximately 43 minutes per interview, on average. The interviews were conducted with unit and division managers, the CIO, the digital director, IT-strategists, business strategists, technicians, service developers, system developers, and operational strategists at STA. We recorded participant observations on 16 occasions, generating 160 hours of observations during six project meetings, one board of directors meeting, one steering committee of division managers meeting, 10 workshops, and one two-day seminar. A substantial volume of secondary data was also collected, including presentations, project descriptions, project reports, four drafts of digital strategy documents, summarized interviews from the consultancy firm and the ITUT and DOI research projects.

3.3 Data analysis

We initiated our data analysis using an open coding procedure to discover relevant concepts in the data and group them into categories (Charmaz, 2006), detailing the emergent process of the digital strategy. The first round of analysis helped us to identify current operational challenges at STA and allowed us to develop an initial understanding of the organization. During the second round, we detailed our understanding of actors involved in the digital strategy formation process, their intentions and the internal processes at STA. The open coding procedure carried out during the two rounds of analysis generated 233 descriptive concepts initially. To decrease similarity, we reviewed and compared all concepts to formulate preliminary definitions of more than 104 mutually exclusive concepts. Next, in accordance with the principle of abstraction and generalization (Klein and Myers, 1999), we spent considerable effort iterating between theoretical abstractions related to the IS strategy, digital strategy, and institutional work literature (including concepts such as sense and response, institutional routines, institutional logics, and boundary spanning) and the descriptive concepts generated in the first step. Based on a temporal analysis of the categorization of events, we identified the three phases and practices described in section 4. These phases were demarcated by relative continuity within phases and discontinuities at their borders (Langley 1999) in terms, *inter alia*, of participating agents, aims and scope of strategy formation and formal decision-makers involved.

This iteration between abstracted conceptions and empirical observations resulted in an understanding of the digital strategy formation process, particularly the dynamic interaction between the existing strategy and the emergent digital strategy process. In the next section we present our results.

4 Results

4.1 Phase 1: Creating common ground and shared commitment

"We are an organization with a scattered view of the understanding and role of digitalization… we lack a coherent view" (CIO, STA)

At STA, the initiation of the digital strategy formation processes illuminated and challenged existing differences in understanding of the role of digitalization within the organization. Thus, the overall purpose of the Strat-one project, carried out by the external consultancy firm in late November 2014, was to clarify the key characteristics of digitalization, identify how it would affect the organization in the short-, medium- and long-term, and identify important building blocks for constructing a digital strategy. Thus, the overall purpose of the Strat-one project, carried out by the external consultancy firm in late November 2014, was to clarify the key characteristics of digitalization, identify how it would affect the organization in the short-, medium- and long-term, and identify important elements and approaches for constructing a digital strategy. Important goals were to assess current assumptions and pre-existing understanding of management regarding issues such as key aspects of digitalization and elements of a digital strategy, as well as the optimal approach and course of action to formulate a digital strategy. In many ways this resembled what Lawrence and Suddaby (2006) refer to as a work practice of ´theorizing´ as it involved developing and specifying new concepts of cause and effect.

The external consultants subsequently conducted 14 interviews with various managers within the organization and arranged two workshops with the aim of ´educating´ (Lawrence and Suddaby, 2006) staff regarding concepts related to digitalization (such as digitization, digitalization, bimodality, civic moments, internet of things, mobility IT/OT). The results were later presented in mid-January 2015 during the third (and final) workshop, when the focus group and interviewed managers reflected on the outcome. For example, the consultants established that numerous activities and projects within STA could potentially profit from pervasive digitalization. In addition, substantial time and money were spent on numerous research and innovation (RAI) projects to promote the organization's digitalization. However, most of the activities that reached the implementation stage were directed towards digitizing current processes rather than introducing an innovative approach or fundamentally challenging any core operations. Furthermore, most RAI projects, operational activities, and other projects with

digitalization potential, were unconnected and carried out in silos throughout the organization. As the IT division manager explained:

"The current projects and activities carried out in the organization do not mesh with each other… I think we're duplicating work without seeing any profits or having a holistic perspective on it."

The consultants had explicitly concluded that the organization lacked what they referred to as a "holistic" perspective on digitalization and that the IT division was wrongly regarded as the only division required to formulate and implement a digital strategy. As the business developer noted:

"It's important to understand that every single department in this organization is affected by digitalization and not only the IT division. Look at the current focus group, there are seven individuals with an IT focus and one business developer."

The lack of heterogeneity and understanding of the overall organizational system was perceived as a weakness that hampered the process, resembling what Leonardi (2011) calls "innovation blindness", where key actors in an organization only consider the implications of digitalization for their particular unit rather than focusing on the overall organization. The incoherent views of the role of the digital strategy was particularly evident in the last stages of the so-called anchoring meeting in early January 2015. Although this was the last meeting of representatives of the consultancy firm and STA, internal voices challenged fundamental aspects of the approach (efforts to change normative associations):

"they (the division managers in the organization) need to understand that this is not a matter only for our IT division" (IT-strategist at STA).

Essentially there was still little, if any, understanding of the organizational implications of the digital strategy. The consultancy firm recommended that Strat-one should involve managers from different divisions in future strategy formation processes to enhance the status and prioritization of the digital strategy in the organization. Similar opinions were raised within the organization:

"The (strategic formation) process must be embraced by our planning division (the strategic planning unit is part of the planning division) … otherwise, we'll have an additional strategy we shelve. (IT-strategist at STA).

A key observation in this stage was that in order for the strategy formation process to prosper there was a need to "define the boundaries of membership" (Lawrence and Suddaby, 2006) and create ´constitutive rules (Scott, 2001) i.e. boundaries, rules, and systems that would enable rather than constrain further movements. Hence, a recommendation by Strat-one participants was that the digital strategy formation process should pay more attention to intersections between operational issues and technological functionality. They also noted that this required a higher degree of involvement of people with a profound understanding of operations, but also better understating of digitalization. Results from the project steering committee meeting in late January 2015 included important decisions to: allocate responsibility for future formation of the digital strategy to the strategic planning unit; appoint a digitalization director; increase skills of employees in utilization of digitalization; and enhance awareness of its potential in business development. These decisions were taken with the aim to mobilize political and regulatory support, ´advocacy´ *sensu* Lawrence and Suddaby (2006). In addition, the digital strategy would need clear connections to other current strategies, missions, and visions, promote a holistic perspective, address risks and potentials in current digitalized society, and support STA in managing current and future customers and partners. An action plan for the next step in the digital strategy formation process was developed. The organization was aware that resources and commitment from all divisions were required, and that the journey would not be easy. Instead of continuing to work with the current group of consultants, STA decided to lead the process themselves. As the CIO commented:

"We made the decision to continue working on our own path because we are the only ones who fully understand our operational context, we have now developed a new route to take."

4.2 Phase 2: Identifying strategic challenges

"We have learned that we cannot continue splitting business from IT, they are becoming more and more interlaced." (Business strategist, STA)

In the beginning of February 2015, a former communication director at STA, took a new role as digitalization director, with responsibility for establishing a group that would continue working on the digital strategy formation. The digital director noted:

"I've now learned that digitalization is an operational issue, where IT and business aren't separated, so I've decided to gather members from various parts of the organization."

The aim of Strat-two was to involve both managers and employees in the digital strategy formation process, and several important decisions were taken accordingly. The first was to initiate a research project, dubbed ITUT, to increase knowledge and awareness of the organizational impact of digitalization and conduct a market analysis. Second, in an emergent strategy manner (Mintzberg, 1994), a thorough internal organizational investigation was conducted in which each unit was obliged to answer the following question: How would digitalization improve your daily operational tasks?

A third decision led to organization of a two-day seminar on digitalization during April 2015, with 13 presenters from research institutes, universities, and industry. Ninety-two participants representing several positions and divisions were involved. The seminar focused on ´educating´ (Lawrence and Suddaby, 2006) STA employees, to increase their digital competence by presenting relevant digitalization research and projects related to STA and associated industries. Various questions related to work on 'constructing identities´ (Lawrence and Suddaby, 2006) were intensively debated, including the following examples. How can I make sense of this in my daily work? What is my role in the process of implementing this in our organization? What should we do? How should we approach it? It was readily apparent that the participants had difficulties in seeing how the ITUT initiatives could be implemented and realized in the organization, and a need for direction was clearly raised:

"We need direction, a sort of strategic approach that would help us at least see what we're supposed to do and not do." (Business strategist at STA)

The market analysis report produced in the ITUT project was influenced by STA's strategic national plan of action, and identified a need to work collaboratively with other authorities and traffic teams using the transport system. It suggested that joint digitalization initiatives would be valuable, particularly as all the actors depended on open data, but different elements of the Swedish transport system were using diverse information systems and digital platforms. ITUT project members speculated that new digital technologies would likely be the most revolutionary developments for future transport services. Most revolutionary was the idea of exploiting the potential of open data and engagement of third-party developers in creating innovative digital services.

In addition, the investigation revealed that digitalization would challenge traditional organizational structures (partly because it required an *"agile, proactive, and collaborative mindset"*), and revealed a clear need to "change normative associations" (Lawrence and Suddaby, 2006) by strengthening intra-organizational collaborations and increasing communication and interaction among divisions within the organization. While communication and collaboration could be strengthened through reallocation of resources, STA realized that in order for digital innovation to occur and a digital strategy to penetrate all divisions in the organization, a new communication platform was required. The platform was intended to provide tools and processes to facilitate communication and collaboration on digitalization, with the aim to construct normative networks (Lawrence and Suddaby, 2006) by transforming traditional (current) structures, methods, and norms.

Through Strat-two, the initial boundaries and content of the digital strategy were established. To summarize the second draft of the digital strategy document, this involved efforts to: balance opportunities and challenges, increase flexibility in governance to utilize innovation power, act as a catalyst for the market, strengthen life-long learning, change leadership and culture, use data as an asset, and act collectively. Armed with greater awareness and experience from the first digital strategy, STA aimed to

launch and implement operational projects that would follow the emerging strategy document. The business strategist explained:

"We wanted to initiate new operational projects based on operational challenges"

Thus, new initiatives commenced, most significantly a third strategy formation project, Strat-three. The aims were to identify particularly challenging operational tasks where digitalization could act as a catalyst, find clusters of employees from different units within the organization who could address these challenges, and continue to develop the digital strategy. The Digital director explained:

"We wanted to engage people (employees) within our organization in developing projects that they saw potentials in, not just start yet another research project that they wouldn't be able to implement in their daily operations."

4.3 Phase 3: Cross-fertilizing and ensuring compliance through new interactions

"We use the innovation force of digitization as a natural part of the business to create customer benefit, efficiency, and a sustainable transport system" (Document, Digital strategy)

The strategy formation project Strat-three started in early August 2015. The aim was to continue working in an emergent strategizing manner, identifying, verifying, and deepening understanding of the organization's operational challenges and developing related operational projects that could be leveraged through digitalization. A sub-goal of the formulation and penetration of the digitalization strategy was to develop approaches to address operational issues by identifying 'emergent candidates' (Lind and Henfridsson, 2013) for digital organizational assets through sub-communities of practitioners. Such emergent candidates might, if accepted by the larger organizational community, rally enough support to evolve into components of an emergent strategy if realized. Thus, a research project (referred to as DOI) was launched, and the formation group in Strat-three continued to analyze, discuss and draw conclusions from results from the former projects Strat-one and Strat-two, aiming to present a first draft of the digital strategy to the organization.

In mid-September 2015, STA's digital director organized a workshop to generate a common representation of STA's views on the possibilities, risks, and challenges associated with digitalization, present outcomes of the previous phases in the strategy formation process, and introduce the first draft of the digitization strategy document. The first part of the workshop focused on ´defining´ (Lawrence and Suddaby, 2006) through elaboration of the formulation of goals linked to the digitalization strategy. The second part of the workshop focused on ´theorizing´ (Lawrence and Suddaby, 2006) on operational issues related to challenging innovation, success factors, ability and competence, market relations, and risk management in relation to the digital strategy. Each part of the workshop began with a presentation from two STA employees. This was followed by group discussions, and summaries of each group's discussions and conclusions. Eighty-seven of the organization's employees attended the workshop and discussed, analyzed, and reflected on the current draft of the digitalization strategy

The material used during preliminary stages of the subsequent DOI research project was drawn from various sources, including records provided by the consultancy firm, previous responses from various units in the organization, the market analysis, and results from the ITUT research project. As already mentioned, the aims of the project were to foster a common vision and anchor operational challenges from multiple perspectives by suggesting and operationalizing future emergent candidates (Lind and Henfridsson 2014), i.e., constructing identities and changing normative associations, (Lawrence and Suddaby, 2006). Hence, the development of emergent candidates (Lind and Henfridsson, 2014) was based on operational strategies that emerged during several workshops, focus group sessions, and interviews with various respondents in the organization spanning an extensive period. After interactions with a total of 67 employees from the organization, 11 potential emergent candidates were presented during the final workshop in the project. The candidates were discussed, analyzed, and in some cases merged during the workshop. In total, six emergent candidate projects were identified, each of which was assigned a group of dedicated employees to promote it. During a management seminar on De-

cember 9, 2015, the six emergent candidates were presented: (1) Digital Traffic Management and Operational Process, (2) Information and analysis of robust and reliable infrastructure, (3) Measurement studies in relation to BIG Data analysis, (4) My messages - A secure digital mail service for authorities and municipalities, (5) Modern digital workplace - opportunities and pitfalls, and (6) The blind men and the elephant – a way to overcome silo operational solutions in the organization.

By the beginning of June 2016, the first digital strategy was incorporated into the organization's national plan for 2018-2029. However, the digitalization strategy element only covered the period 2018-2021. It described how digitalization would contribute to the transport system's development to meet national objectives for the sector and important societal objectives. It also provides an assessment of associated requirements and a rough estimate of the costs of implementing the suggested digital strategy (2.7 billion Euros). The document concluded that the overall objective of the digital strategy was to facilitate the provision and maintenance of socio-economically efficient transport with long-term sustainability for citizens and industry throughout the country.

"Digitalization's rapid rate of development requires flexibility in both planning and implementation during the planning period. In the next five years, you can foresee some trends that have the potential to radically change society and transport. These trends should be considered when planning the transport system's development, both short- and long-term" (Digital strategy, STA)

The digital strategy documentation emphasized that new ecosystems will require new business and security models, technical platforms and methods for creating solutions. It also explicitly stated that STA would not be able to leverage digitalization of the transport system without close collaboration with cross-sectional actors. A formal decision to adopt the digital strategy was finally taken in 2017.

5 Discussion and Implications

Our objective in this study was to examine ways that organizations may attempt to foster institutional work practices that promote fruitful digital strategy formation. While studies of digital strategy emphasize what it is and how it differs from traditional IT strategy (e.g. Bharadwaj et al., 2013; Kane et al., 2015), the internal processes through which planned and emergent strategy formation are intertwined have received less attention. Our findings provide three contributions to the literature on digital strategy formation. First, they highlight different strategizing approaches across three phases as the focal organization explored ways to balance and integrate business and digital competencies. Second, they demonstrate the cumulative nature of digital strategy formation and how organizations may develop capacity over time for strategizing. Third, they reveal distinct work practices aimed at creating new institutional arrangements in the three identified phases of the strategy formation process. In the following text, we discuss these contributions in detail.

The strategy formation process at STA was initiated by top management of the IT division (CIO and division manager) and initially driven by a globally leading consultancy firm. Over time, the process changed from a top-down technocentric initiative to include a broad set of actors with varying competencies, focusing on identifying synergies, increasing boundary-spanning communication and creating shared commitment to change. Our analysis identified three process phases: 'creating common ground and shared commitment', 'identifying strategic challenges', and 'cross-fertilization through new interactions'. As summarized in Table 1, these phases were distinguished by differences in involved actors, the role of IT in relation to operations, aims, and approaches, and forms of work practices.

Across these phases, harmonizing the business and IT perspectives was a salient challenge (Marabelli and Galliers, 2017). The first phase was dominated by an IT perspective, while in the second business-related challenges became the main concern. However, educational activities increased understanding of digital trends and potentially useful technological approaches. As staff in operational roles learned about such potential and interacted with people who had broader and deeper technical skill sets, the perceived role of digitalization grew in terms of both the identified problems it could potentially address and project proposals. These communications among heterogeneous actors played a key role in shaping the planned digital strategy, ensuring that it was anchored both in digital resources and the

operational context. Further, insights from these activities fed into the multiple iterations of the suggested strategy, and the ability to strategize based on digital resources in the third phase. Thus, the learning in the process included increases in both awareness of organizational arrangements for fostering digital strategizing, and individuals' ability to engage in such practices. This suggests that transformation from IT strategizing to digital strategizing involves challenging balancing of perspectives to achieve synergistic outcomes.

Strategy formation element	Phase 1: Creating common ground and shared commitment	Phase 2: Identifying strategic challenges	Phase 3: Cross-fertilizing and ensuring compliance through new interactions
Organizational Initiative	Contracting consultancy firm to leverage specialist competency in digitalization and analyze managerial perspectives on digital strategy.	Involvement of actors at multiple organizational levels and across units through research projects, idea-gathering from units, and workshops with employees, universities and industry due to realization that "*IT and business aren't separated*".	Strengthened involvement of actors from phase 2 to identify, verify, and deepen understanding of the organizational challenges and develop related operational digitalization projects.
Work Practices	- Advocacy - Defining - Changing normative associations - Theorizing - Educating	- Changing normative associations - Constructing identity - Constructing normative networks - Educating	- Defining - Changing normative associations - Constructing identity - Theorizing
Outcome	Control of the initiative taken back internally and scope of involved actors broadened to anchor initiatives in operations.	Creation of communication platform for digital strategy formation and development of goals of digitalization that guided identification of operational focus areas and projects.	Development of digital strategy that was formally decided by the board of directors and launch of projects to start implementation and continual strategy formation process.

Table 1. Summary of the Strategy Formation Process

Further, while the process initially focused on top managers and external expertise, it gradually involved a larger set of actors across a multitude of hierarchical levels with heterogeneous skill sets. This development reflects the blurring of boundaries and distributed nature of agency in digital contexts (Lyytinen et al., 2016) and highlights needs to enable generation of emergent candidates and provide an environment that fosters them (Henfridsson and Lind, 2014). The digital strategy formation process at STA was cumulative. For example, the institutional work carried out in the third phase drew on learning from work in the previous phases, and occurred in an institutional context shaped by it. Similarly, the digital strategy formation process at STA did not end with acceptance of the formalized strategy. Instead, the realized strategy will continue to arise from work carried out in which emergent and planned strategies are synthesized. The process we studied has created certain conditions for this work and increased the organization's ability for future digital strategizing. Thus, organizations engaging in new digital strategy formation processes should consider digital strategy formation as a continuous cumulative effort, rather than as a series of discrete projects.

The first phase largely involved managers (in a top-down, planning approach), had IT as the starting point, and was intended to launch a change process by initiating discussion and re-appraisal of managerial views and perspectives. It included educating and theorizing practices regarding definitions and understandings of key concepts. Other activities included identification of ongoing potentially relevant IT projects, interviews with top management, appointment of a digitalization director, and creation of a sounding board (to facilitate changes in normative associations). In addition, efforts were made to foster political support by involving the board of directors, to which the CIO reported (advocating types of practices). After a while, the initiative faced resistance from actors with business perspectives (e.g., business strategists) who argued that to get bearing throughout the organization, a digital strategy

should not focus solely on IT issues and embrace much broader organizational perspectives.

In response to these opinions, the second phase, 'identifying strategic challenges', was initiated by a reallocation of ownership from the IT division to the strategic planning unit. This phase involved actors at various hierarchical levels with various specializations (in a bottom-up approach), and focused on identification of operational challenges throughout the organization that could be addressed by digitalization. The group in charge of the process (half of whom were IT specialists and half were business-oriented) considered it important to create a sense of participation and involvement, and thus sought to engage more actors (constructing identities and changing normative associations). Accordingly, educating and constructing identities practices involved a larger group of actors with distinct skill sets and hierarchical roles (*inter alia* in a two-day seminar and workshops). Important outcomes of these activities were the creation of a first draft of the digital strategy and integration of the identified operational challenges deemed relevant.

In line with the previous phase, the third phase, 'cross-fertilization through new interactions', involved a large and diverse group of actors, and key aims were to identify intersections between organizational goals and the potential of digital resources, then realize the digital strategy by achieving synergies between planned and emergent strategizing. This phase involved multiple iterations in which drafts of a formal digital strategy were presented, feedback was sought, and efforts were made to identify projects that would contribute to its stated goals. Work on defining, theorizing, changing normative associations and constructing identities among actors continued through workshops and project groups. An important element of this work was encouragement of interactions among interested individuals with different backgrounds across organizational units, to create projects anchored in daily operational activities but with considerable innovation height. It also promoted further involvement in the strategy formation process. This work resulted in numerous project proposals, and through iterations among participants aimed at identifying potential overlaps and synergies among projects, larger projects were created. In addition, people in important roles for the projects and with essential competencies were identified and included (changing normative associations). Thus, this phase involved both generation of emergent candidates (Henfridsson and Lind, 2014) and selection of candidates to foster through resource allocation. The selection occurred largely through a distributed process in which support from appropriate persons in the organization was essential (and obtained through advocacy). By facilitating cross-fertilizing activities in this phase, the (planned) formal strategy was refined, finally agreed, and the first projects aimed at its realization were developed.

Overall, the strategy formation process at STA included recursive interactions among the macro organizational level and micro-level practices. Our analysis demonstrates how planned and emergent digital strategy formation initiatives may intertwine and feed each other. Due to high levels of demand uncertainty and technological discontinuity (El Sawy et al. 2010), digital strategy formation processes must be ongoing and highly dynamic. Our results suggest that organizations can benefit from fostering macro-micro interactions to dynamically harmonize planned and emergent strategy formation.

References

Aanestad, M. and Blegind Jensen, T. (2011). "Building Nation-Wide Information Infrastructures in Healthcare through Modular Implementation Strategies", *The Journal of Strategic Information Systems,* Vol. 20 No. 2, pp. 161-176.

Baptista, J., Newell, S. and Currie, W. (2010). "Paradoxical Effects of Institutionalisation on the Strategic Awareness of Technology in Organisations", *The Journal of Strategic Information Systems,* Vol. 19 No. 3, pp. 171-183.

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A. and Venkatraman, N. (2013). "Digital Business Strategy: Toward a Next Generation of Insights", *MIS Quarterly,* Vol. 37 No. 2, pp. 471-482.

Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis* Sage, Thousand Oaks, CA.

David, P. A. (1994). "Why Are Institutions the 'Carriers of History'?: Path Dependence and the Evolution of Conventions, Organizations and Institutions", *Structural change and economic dynamics,* Vol. 5 No. 2, pp. 205-220.

El Sawy, O. A., Malhotra, A., Park, Y. and Pavlou, P. A. (2010). "Research Commentary-Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango", *Information Systems Research,* Vol. 21 No. 4, pp. 835-848.

Garud, R., Jain, S. and Tuertscher, P. (2008). "Incomplete by Design and Designing for Incompleteness", *Organization studies,* Vol. 29 No. 3, pp. 351-371.

Gawer, A. and Phillips, N. (2013). "Institutional Work as Logics Shift: The Case of Intel's Transformation to Platform Leader", *Organization Studies,* Vol. 34 No. 8, pp. 1035-1071.

Greenwood, R., Suddaby, R. and Hinings, C. R. (2002). "Theorizing Change: The Role of Professional Associations in the Transformation of Institutionalized Fields", *Academy of management journal,* Vol. 45 No. 1, pp. 58-80.

Guillemette, M. G., Mignerat, M. and Paré, G. (2017). "The Role of Institutional Work in the Transformation of the IT Function: A Longitudinal Case Study in the Healthcare Sector", *Information & Management,* Vol. 54 No. 3, pp. 349-363.

Henfridsson, O. and Lind, M. (2014). "Information Systems Strategizing, Organizational Sub-Communities, and the Emergence of a Sustainability Strategy", *The Journal of Strategic Information Systems,* Vol. 23 No. 1, pp. 11-28.

Henfridsson, O., Mathiassen, L. and Svahn, F. (2014). "Managing Technological Change in the Digital Age: The Role of Architectural Frames", *Journal of Information Technology,* Vol. 29 No. 1, pp. 27-43.

Henfridsson, O., Nandhakumar, J., Scarbrough, H. and Panourgias, N. (2018). "Recombination in the Open-Ended Value Landscape of Digital Innovation", *Information and Organization,* Vol. 28 No. 2, pp. 89-100.

Hinings, B., Gegenhuber, T. and Greenwood, R. (2018). "Digital Innovation and Transformation: An Institutional Perspective", *Information and Organization,* Vol. 28 No. 1, pp. 52-61.

Jarzabkowski, P. and Spee, A. P. (2009). "Strategy-as-Practice: A Review and Future Directions for the Field", *International Journal of Management Reviews,* Vol. 11 No. 1, pp. 69-95.

Johnson, G., Melin, L. and Whittington, R. (2003). "Guest Editors' Introduction", *Journal of management studies,* Vol. 40 No. 1, pp. 3-22.

Kallinikos, J., Aaltonen, A. and Marton, A. (2013). "The Ambivalent Ontology of Digital Artifacts", *MIS Quarterly,* Vol. 37 No. 2, pp. 357-370.

Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D. and Buckley, N. (2015). "Strategy, Not Technology, Drives Digital Transformation", *MIT Sloan Management Review and Deloitte University Press,* Vol. 14 No., pp. 1-25.

Karpovsky, A., Hallanoro, M. and Galliers, R. D. (2013). "Process of Information Systems Strategizing: Review and Synthesis". *Information Systems and Information Technology*. eds. H. T. R. Cohen, A. Tucker: pp. 1-26. Chapman & Hall, London, London.

Kitchener, M. (2002). "Mobilizing the Logic of Managerialism in Professional Fields: The Case of Academic Health Centre Mergers", *Organization studies,* Vol. 23 No. 3, pp. 391-420.

Klein, H. and Myers, M. (1999). "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems", *MIS Quarterly,* Vol. 23 No. 1, pp. 67-94.

Langley, A. (1999). "Strategies for theorizing from process data" *Academy of Management review*, Vol. 24 No. 4, pp. 691-710.

Lawrence, T., Suddaby, R. and Leca, B. (2011). "Institutional Work: Refocusing Institutional Studies of Organization", *Journal of management inquiry,* Vol. 20 No. 1, pp. 52-58.

Lawrence, T. B. and Suddaby, R. (2006). "Institutions and Institutional Work. ". *Handbook of Organization Studies*. eds. C. H. SR Clegg, TB Lawrence and W. Nord: pp. London, Sage.

Leonardi, P. M. (2011). "Innovation Blindness: Culture, Frames, and Cross-Boundary Problem Construction in the Development of New Technology Concepts", *Organization Science,* Vol. 22 No. 2, pp. 347-369.

Lyytinen, K., Yoo, Y. and Boland Jr, R. J. (2016). "Digital Product Innovation within Four Classes of Innovation Networks", *Information Systems Journal,* Vol. 26 No. 1, pp. 47-75.

Marabelli, M. and Galliers, R. D. (2017). "A Reflection on Information Systems Strategizing: The Role of Power and Everyday Practices", *Information Systems Journal,* Vol. 27 No. 3, pp. 347-366.

Miles, M. B. and Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*, Sage Publications, Thousand Oaks.

Mintzberg, H. (1978). "Patterns in Strategy Formation", *Management science,* Vol. 24 No. 9, pp. 934-948.

Mintzberg, H. (1994). "The Fall and Rise of Strategic Planning", *Harvard Business Review,* Vol. 72 No. 1, pp. 107-114.

Nambisan, S. (2016). "Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship", *Entrepreneurship Theory and Practice,* No., pp.

Nambisan, S., Lyytinen, K., Majchrzak, A. and Song, M. (2017). "Digital Innovation Management: Reinventing Innovation Management Research in a Digital World", *MIS Quarterly,* Vol. 41 No. 1, pp. 223-238.

Pan, S. L. and Tan, B. (2011). "Demystifying Case Research: A Structured–Pragmatic–Situational (Sps) Approach to Conducting Case Studies", *Information and Organization,* Vol. 21 No. 3, pp. 161-176.

Parker, G., Van Alstyne, M. and Jiang, X. (2017). "Platform Ecosystems: How Developers Invert the Firm", *MIS Quarterly,* Vol. 41 No. 1, pp. 255-A254.

Pavlou, P. A. and El Sawy, O. A. (2011). "Understanding the Elusive Black Box of Dynamic Capabilities", *Decision Sciences,* Vol. 42 No. 1, pp. 239-273.

Peppard, J., Galliers, R. D. and Thorogood, A. (2014). "Information Systems Strategy as Practice: Micro Strategy and Strategizing for IS", *The Journal of Strategic Information Systems,* No., pp.

Sambamurthy, V., Bharadwal, A. S. and Grover, V. (2003). "Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms", Journal, Vol. 27 No. Issue, pp. 237-263.

Sandberg, J. (2014). *Digital Capability: Investigating Coevolution of IT and Business Strategies*. Umeå University, Umeå.

Scott, W. R. (2001). *Instituitions and Organizations*, Sage, Thousande Oakes.

Skog, D. A., Wimelius, H. and Sandberg, J. (2018). "Digital Disruption", *Business & Information Systems Engineering,* Vol. 60 No. 5, pp. 431-437.

Svahn, F., Mathiassen, L. and Lindgren, R. (2017). "Embracing Digital Innovation in Incumbent Firms: How Volvo Cars Managed Competing Concerns", *MIS Quarterly,* Vol. 41 No. 1, pp. 239-254.

Tanriverdi, H., Rai, A. and Venkatraman, N. (2010). "Research Commentary-Reframing the Dominant Quests of Information Systems Strategy Research for Complex Adaptive Business Systems", *Information Systems Research,* Vol. 21 No. 4, pp. 822-834.

Tilson, D., Lyytinen, K. and Sorensen, C. (2010). "Research Commentary-Digital Infrastructures: The Missing IS Research Agenda", *Information Systems Research,* Vol. 21 No. 4, pp. 748-759.

Tiwana, A., Konsynski, B. and Bush, A. (2010). "Platform Evolution: Coevolution of Platform Architecture, Governance and Environmental Dynamics", *Information Systems Research,* Vol. 21 No. 4, pp. 675-687.

Walsham, G. (2006). "Doing Interpretive Research", *European journal of information systems,* Vol. 15 No. 3, pp. 320-330.

Woodard, C. J., Ramasubbu, N., Tschang, F. T. and Sambamurthy, V. (2013). "Design Capital and Design Moves: The Logic of Digital Business Strategy", *MIS Quarterly,* Vol. 37 No. 2, pp.

Yoo, Y., Boland, R. J., Lyytinen, K. and Majchrzak, A. (2012). "Organizing for Innovation in the Digitized World", *Organization Science,* Vol. 23 No. 5, pp. 1398-1408.

Yoo, Y., Henfridsson, O. and Lyytinen, K. (2010). "Research Commentary: The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research", *Information Systems Research,* Vol. 21 No. 4, pp. 724-735.