GOVERNING FOR AGILITY AND INNOVATION IN DATA-RICH ENVIRONMENTS: THE ROLE OF DATA ANALYTICS CAPABILITIES

Giorgi Shuradze  
*European University Viadrina, shuradze@europa-uni.de*

Heinz-Theo Wagner  
*German Graduate School of Management & Law, heinz-theo.wagner@ggs.de*

Follow this and additional works at: [http://aisel.aisnet.org/ecis2016_rip](http://aisel.aisnet.org/ecis2016_rip)

Recommended Citation  
[http://aisel.aisnet.org/ecis2016_rip/27](http://aisel.aisnet.org/ecis2016_rip/27)
GOVERNING FOR AGILITY AND INNOVATION IN DATA-RICH ENVIRONMENTS: THE ROLE OF DATA ANALYTICS CAPABILITIES

Research in Progress

Shuradze, Giorgi, European University Viadrina, Frankfurt (Oder), Germany, shuradze@europa-uni.de
Wagner, Heinz-Theo, German Graduate School of Management and Law, Heilbronn, Germany, heinz-theo.wagner@ggs.de

Abstract

While previous studies agree that governance of information technology (IT) capabilities is an enabler of organizational agility and innovation, scant attention has been paid to exploring capabilities that are antecedents of agility and successful innovation in data-rich environments. By drawing on IT capabilities literature, in this research in progress paper we conceptualize a three-dimensional second-order construct of data analytics capabilities and propose to test its enabling effect on agility and consequently on innovation success in an environment with a copious amount of data. Our proposition is that data analytics capabilities consisting of the dimensions of infrastructure, personnel expertise, and inter-unit social infrastructure, can lead to organizational agility, which in turn leads to successful innovation. In this study, we develop a theoretical model and present hypotheses for empirical testing. The methodology for conducting a web-based survey and anticipated theoretical as well as practical contributions are presented.

Keywords: Agility, Innovation, Data Analytics, Capability, Survey.

1 Introduction

Agility, which is an ability to detect and seize business opportunities, and continual innovation have become core components of strategic thinking in most contemporary corporations (Sambamurthty et al., 2003). In today’s volatile business environment, characterized by rapidly changing customer preferences and shorter product life cycles, interest in agility is increasing in theory and practice alike. In practice, this interest spans across companies, from the largest European airline carrier Lufthansa (Weiss, 2015) and retail giant Wal-Mart (Pettypiece, 2015) to technology multinational Cisco (Hugos, 2009). Similarly, in research, the interest in agility spans a broad range of literature. Initially, the concept of agility emerged in studies related to flexible and lean manufacturing (Dove 2001). Later, according to Mathiassen and Pries-Heje (2006), the concept grabbed the attention of scholars examining
organizations producing software using agile development methods. Since in the contemporary world strategic governance of information systems (IS) allows rapid detection of changes in the business environment (Acito and Khatri, 2014; Barton and Court, 2012; Chen et al., 2012; Goes, 2014; Simons, 2014), agility has also started to gain significant attention from IS researchers (Hitt et al., 1998; Overby et al., 2006; Rai et al., 2006; Sambamurthy et al., 2003; Tallon and Pinsonneault, 2011; Weill et al., 2002). Technology-enabled agility provides firms with the ability to respond quickly to customer demands and market dynamics (Mathiassen and Pries-Heje, 2006). This type of agility can be characterized by quickness in sensing relevant events, evaluating the consequences of these events for the organization, exploring options and making decisions, and providing relevant reactions (Haeckel, 1999).

One stream of IT-agility literature is particularly focusing on the interplay between IT capabilities and organizational agility (Chen et al., 2014; Lu and Ramamurthy, 2011; Tallon, 2008). Past studies generally agree that IT capabilities can enable agility (Lu and Ramamurthy, 2011) and discuss this relationship in various contexts. According to Sambamurthy et al. (2003), investments made in IT capabilities can influence firm performance, suggesting that this relationship is mediated by customer, operational, and partnering agility. Fink and Neumann (2007) further demarcate IT personnel and IT infrastructure capabilities and examine the association of the latter with IT-dependent organizational agility. What is noteworthy about their study is that the authors, in contrast to other studies (Chen et al., 2014, 2014; Lee et al., 2015; Liu et al., 2013; Tallon, 2008), consider IT-dependent agility to be a complex construct comprising IT-dependent systems, information, and strategic agility; therefore, the influence of infrastructure capabilities on each agility type is studied separately. Tallon (2008) and Chen et al. (2014) study the influence of IT capabilities on business process agility. According to Tallon (2008), the relationship between managerial IT capability and business process agility is mediated by technical IT capability, with the results highlighting the importance of governance over physical IT artefacts in the process of achieving agility. Further, Liu et al. (2013) apply IT-agility examination to the supply chain context. In their study, based on a hierarchy of capabilities, they examine how two types of IT capabilities, i.e. flexible IT infrastructure and IT assimilation, influence firm performance through supply chain agility, proposing absorptive capacity as a mediating variable between the two. In sum, there have been numerous studies exploring the relationships between IT capabilities and organizational agility in various contexts.

Recently, the topic of specific IT capability profiles, enabling agility in data-rich environments, has gained increasing importance. The reason for this is that in the contemporary environment of pervasive digitalization, business infrastructure is becoming digitalized, with increased interconnections among products, processes, and services (Bharadwaj et al., 2013) that lead to a plurality of data sources (Yoo et al., 2010). Consequently, the prevalence of data and sophisticated analytics open new frontiers, where hyper-competition requires agility and responsiveness (Kohli and Grover, 2008), and in which organizations need to develop digital strategy frameworks to harness the unique capabilities of digital technology (Yoo et al., 2010). However, scant attention has been given to the effects of specific IT capability profiles in terms of enabling agility in data-rich environments (Kohli and Grover, 2008; Lu and Ramamurthy, 2011).

To address this gap, we investigate a specific IT capability profile called data analytics capabilities and propose the following research question for investigation: How are data analytics capabilities related to agility and innovation success?

To address the research question, drawing on the IT capabilities literature, we conceptualize a three-dimensional second-order construct of data analytics capabilities and propose to explore its enabling effect on organizations’ agility and, consequently, on innovation success in data-rich environments. With these conceptual developments, we argue that organizations in data-rich environments with abundant digital data require the appropriate technological infrastructure, competence, as well as the relational infrastructure between organizational business and IT units to stay agile and innovative in a volatile and competitive environment.
The results of the presented study are expected to contribute to the existing IT-agility conversation in several ways. First, they will shed light on the effects of a specific IT capability on business strategies and firm performance in the contemporary digitalized world (Kohli and Grover, 2008; Wang et al., 2012). Second, in our study, the connection between data analytics capabilities and organizational agility will be made explicit. This connection can explain why some organizations are better than others at using data to detect and react to environmental changes. Finally, the moderating influence of environmental turbulence will be examined, with these effects better explaining the entire chain of variables connecting data analytics capabilities to organizational performance (Bharadwaj, 2000).

The remainder of this paper is organized as follows. In the next section, we provide a brief overview of extant literature that lays the theoretical foundation for the study. The subsequent section depicts the proposed theoretical model of the study, with suggested hypotheses and arguments supporting development of the hypotheses. This section is followed by the methodological section, which deals with questions of data collection and the methodologies that will be applied for data analysis. The paper concludes with expected theoretical and practical contributions.

2 Theoretical Grounding

In this section, we present a brief overview of underlying theories associated with this study. Particularly, in the following sub-section, we will review previous studies on agility in IS research. This subsection will be followed with a short introduction of IT capabilities literature, and the next sub-section will present data analytics literature with the capabilities perspective. The section concludes with subsection on environmental turbulence.

2.1 Agility in IS research

Agility is an organizational ability to detect opportunities for innovation as well as to seize those competitive market opportunities by assembling requisite assets, knowledge, and relationships with speed and surprise (Sambamurthy et al., 2003). This construct first attracted the attention of strategic scholars some 20 years ago (Goldman et al., 1995), and IS scholars introduced this word to their agenda soon after the turn of the second millennium (Breu et al., 2002; Sambamurthy et al., 2003; Weill et al., 2002).

In environments where firms are confronted with unexpected changes and uncertainty in their products and markets, agility is seen as a key competitive imperative (Tallon and Pinsonneault, 2011). In past studies, arguments have been made that investment in information technologies and its governance can enhance firm performance through agility (Sambamurthy et al., 2003). Further studies argue that IT personnel capabilities are the enablers of organizational agility (Tallon and Pinsonneault, 2011). Comprising three dimensions of capabilities, i.e. business, behavioural, and technical capabilities, IT personnel capability influences IT-dependant organizational capability through mediation of IT infrastructure capabilities (Tallon and Pinsonneault, 2011).

While scholars agree that IT infrastructure (i.e. platforms, networks and telecommunications, data, and software applications) contribute to organizations’ ability to sense and respond environmental changes, Roberts and Grover (2012) argue that sole-standing IT infrastructure can only facilitate or constrain this process. As a result, they propose that IT infrastructure plays the role of a magnifier. As such, technological infrastructure allows efficient knowledge sharing, thereby increasing coordination efforts to detect and respond to changes in the environment (Roberts and Grover, 2012). Furthermore, close collaboration between IT and business has been reported to be another significant enabler of organizational agility (Lu and Ramamurthy, 2011). This partnership can lead to more collaborative and strategic application of IT resources. Additionally, close interaction between IT and business units facilitates building trust and respect, which subsequently fosters information exchange and knowledge sharing (Ross et al., 1996), and this in turn plays an important role in the strategic use of IT, increases
the ability of firms to respond to market opportunities (Dove 2001; Roberts and Grover 2012), and positively influences organizational innovation (Damanpour 1991).

Due to the extensive digitalization process and rapidly changing business environment, which require companies to be agile and responsive to deal with the increasing amount of data (Kohli and Grover, 2008), studies on IT-agility interaction are of interest to scholars as well as to practitioners, and calls have been made for more research examining the enabling effects of different types of capabilities on organizational agility under different environmental conditions (Lee et al., 2015).

2.2 IT capabilities

Bharadwaj (2000) defines information technology (IT) capabilities as a firm’s ‘ability to mobilize and deploy IT-based resources in combination or copresent with other resources and capabilities’ (p. 171). Based on resource complementarity arguments, Ravichandran and Lertwongsatien (2005) argue that only targeted IT resources will be likely to generate rents, and the variance in firm performance could only be explained by the extent to which IT is governed to support and enhance firms’ core competences. The authors further argue that these capabilities depend on the technology, human, and relationship resources of the IT department (Ravichandran and Lertwongsatien, 2005).

The literature on the influence of IT capabilities on organizational performance is broad (Aral and Weill, 2007; Benitez-Amado and Walczuch, 2012; Bharadwaj, 2000; Kim et al., 2012; Wang et al., 2012). In a study by Bharadwaj (2000), firms with high IT capability are shown to outperform a control group in a variety of profit- and cost-based performance measures. A positive influence of IT capabilities on financial performance is also supported in the results of studies by Kim et al. (2012) and Quaadgras et al. (2014). Various studies conducted in Chinese export-focused SMEs (Zhang et al., 2008, 2013) reveal that the impact of IT capabilities on organizational performance remains significantly positive irrespective of company size and cross-cultural differences. Lu and Ramamurthy (2011) find a significant positive relationship between IT capability and organizational ability to deal with changes that arise unexpectedly in the business environment.

Although the presented results indicate that IT capabilities influence firm performance, scholars argue that different types of IT capabilities can have different effects on organizational performance (Dale Stoel and Muhanna, 2009; Wang et al., 2012). Therefore, in order to better understand the effect of IT capabilities on organizational performance, more studies should investigate the effects of different IT capability configurations on firm performance (Wang et al., 2012).

2.3 Data analytics capabilities

IT capabilities, as a broadly defined resource, have the advantage of being readily generalized beyond a specific research situation, but they can lose their explanatory value when applied to overly narrow or specific situations (e.g. a data-rich environment). This is due to the fact that the utility of broadly defined resources might come at a more general level of abstraction (Wade and Hulland, 2004).

To address this shortcoming, we extend prior research on IT capabilities and conceptualize data analytics capabilities, a specific type of IT capability, as an organization’s ability to mobilize and deploy data analytics-related resources in combination with marketing resources and capabilities. Our conceptualization of the new construct deploys the general logic of multidimensionality from Ravichandran and Lertwongsatien (2005), and similar to their dimensions, we propose three dimensions, which are further adapted to the context of the study. Hence, in our conceptualization, data analytics capabilities construct comprises the following three dimensions: (1) infrastructure, (2) personnel expertise, and (3) social infrastructure established between IT and the marketing department. Each dimension is briefly described below.

(1) Scholars of data and management studies underline the importance of powerful computational ability for disclosing trends and patterns in large datasets (George et al., 2014), and although sometimes still viewed from its technology roots (Acito and Khatri, 2014), opinion on data analytics is broaden-
ing to encompass data infrastructure and applications required for the effective capture, representation, and delivery of data to inform decision-making and action (Lycett, 2013).

(2) While many companies invest in technologies, these investments do not live up to their full potential unless there is human involvement (Bharadwaj, 2000; Davenport et al., 2001; Howson, 2008; Trkman et al., 2010). In order to build analytics capabilities that can make proficient use of the tools and analysis methods, adequate personnel expertise is required. This expertise is defined as the professional skills and knowledge of technologies, technology management, and marketing functions of IT staff, enabling them to perform assigned tasks effectively (Kim et al., 2011).

(3) In addition to technological infrastructure and human skills, studies show that relationship factors between IT and business units play an important role (Bhatt and Grover, 2005; Wang et al., 2012; Wixom et al., 2013). Considering that marketing is becoming more personalized and techniques that exploit customer heterogeneity are becoming more important, marketing, as a discipline, relies increasingly on information systems (Goes, 2014). Therefore, in our conceptualization of data analytics capabilities, we focus on the relationship between IT and marketing departments.

2.4 Environmental turbulence

Research suggests that external environmental factors are important exogenous variables that have an impact on a firm’s capabilities and competitive performance (Chen et al., 2014; Houston, 1986; Jaworski and Kohli, 1993; Rai and Tang, 2010). Accordingly, environmental turbulence can be defined as general condition of uncertainty related to demand fluctuation (Rai and Tang, 2010). In turbulent environments, it is hard to achieve a competitive advantage, as many changes are occurring simultaneously. In this environment, organizations are required to constantly identify and react to the new business opportunities (Chen et al. 2014). Accordingly, organizations that operate in markets with high demand fluctuations are likely to have to modify their products and services continually in order to satisfactorily meet customers’ changing preferences (Jaworski and Kohli, 1993). Therefore, these organizations are more likely to have a greater need to track and respond to evolving customer preferences as opposed to those businesses that operate in stable markets (Houston 1986; Jaworski and Kohli 1993).

Next, we develop our arguments about how each of the dimensions of data analytics capabilities influence organizational agility and eventually innovation success, how the relationship is moderated by environmental turbulence, and propose hypotheses for empirical testing.

3 Proposed Research Model and Hypotheses

In this section, we develop a research model (Figure 1) to portray data analytics capabilities as an antecedent of organizational agility, with successful innovation being an outcome of this relationship. In this proposition, we also argue that environmental turbulence is moderating this relationship.

In contrast to previous literature on IT capabilities, in general (Bhatt and Grover, 2005; Kim et al., 2012; Wang et al., 2012) as well as on more specific capabilities, e.g. IT-leveraging capability (Pavlou and El Sawy, 2010) that is specific for highly turbulent environments with unexpected ‘storms’, in our conceptualization, we focus on capabilities that are functional in distinct environmental settings (i.e. we focus specifically on capabilities enabling agility in data-rich environments). This is the condition that we will follow throughout the entire hypotheses development process.
First, we turn to the relationship between organizational agility and innovation success. For the purpose of this study, innovation success is defined as successfully marketed newly introduced services/products. As for agility, it is the ability to detect opportunities for innovation and seize those opportunities (Sambamurthy et al., 2003). Agility allows organizations more options in responding to changes, risks, and uncertainties in the environment (Tallon and Pinsonneault, 2011), and these options, in turn, provide organizations with a broad scope of possibilities to respond to emerging market opportunities through changes in products and services (Sambamurthy et al., 2003).

Agility facilitated by technology provides firms with the ability to respond quickly to customer demands and market dynamics (Mathiassen and Pries-Heje, 2006). This type of agility can be demonstrated by quickness in sensing relevant events, evaluating the consequences of these events for the organization, exploring options and making decisions, and reacting in appropriate ways (Haeckel, 1999).

Considering that agility fosters competitive performance and eventually gives firms options to respond to variations in the environment through changes in products and services (Sambamurthy et al., 2003), it is logical to argue that organizational agility leads to successful innovations. Therefore, we pose the following hypothesis:

**H1:** Organizational agility is positively associated with innovation success.

We now turn to the relationship between infrastructure and organizational agility. Infrastructure is the first dimension of data-analytics capabilities, and it is defined as IT assets that form the core of a firm’s overall IT infrastructure, comprising computer technologies and applications required for the effective capture, representation, and delivery of data to inform decision-making and action (Bharadwaj, 2000). Scholars agree that infrastructure is an effective source of value (Bharadwaj, 2000; Broadbent et al., 1999; Ross et al., 1996; Weill and Broadbent, 1998) because it gives organizations the ability to effectively share information across different units, thus increasing flexibility to respond to changes in business strategy. In addition, advanced technology can contribute to the organizational ability to sense and respond to the changing environment, i.e. agility (Weill et al., 2002).

In the context of data-rich environments, technological infrastructure can help organizations to sense changing customer needs, among other, through building virtual customer communities (Holstroem, 2001; Kambil et al., 1999; Nambisan, 2002), where customers can generate, propose, and develop ideas for new products and services (Nambisan, 2002). Moreover, technological infrastructure supports analysing business data which enables organizations to get a better feeling of its environment as well as its customers, and ultimately supports timely decision-making (Chen et al., 2012). Technologies that are often required for data analytics include data warehouses, online analytical processing tools, and various software programs such as Hadoop- and MapReduce-based systems (Chaudhuri et al.,...
opportunities available to the firm (Sambamurthy et al., 2003), technological infrastructure, like web-based customer tools, can also play an important role in customer-based knowledge creation, which could result in customer sensing ability. Although attention to technology is not sufficient, it is always a necessary component of a data analytics strategy (McAfee and Brynjolfsson, 2012). Hence, we put forth the second hypothesis:

**H2: Technical infrastructure has a positive influence on organizational agility.**

In the following paragraph, we argue for the relationship between personnel expertise and organizational agility. As data become affordable, the complements to data become more valuable. Some of the most crucial of these are data scientists and their expertise (McAfee and Brynjolfsson, 2012; Tallon, 2008). **Personnel expertise**, another important component of data analytics capabilities, is defined as professional skills and knowledge of technologies, technology management, business functions, statistical knowledge, and marketing residing in IT staff, allowing them to undertake assigned tasks effectively (Kim et al., 2011).

Nowadays it is an acknowledged belief that personnel expertise allows organizations to meet competitive demands by aligning IT strategies with business strategies, developing reliable and cost-efficient systems, and anticipating IT needs for business services better than competitors (Bhatt and Grover, 2005; Kim et al., 2011; Santhanam and Hartono, 2003). Expertise often described to be necessary for data scientists includes programming skills, computational knowledge, statistical expertise, and awareness of the business field, in which they operate (Bock, 2008; Howson, 2008). Those companies that manage to combine domain expertise with data science will pull away from their rivals (McAfee and Brynjolfsson, 2012). In particular, we propose to look at the more focused expertise of IT professionals (i.e. technical and marketing knowledge), as it is a marketing department’s primary function to track trends and monitor environmental changes as well as to focus on customers and understand their changing needs. Considering that organizations that lack IT personnel expertise are unable to quickly adjust to market changes (Rockart et al., 1996), we expect that personnel expertise will have a significant influence on organizational agility. Therefore, we present our third hypothesis:

**H3: Personnel expertise has a positive influence on organizational agility.**

Next, we turn to the relationship between relationship infrastructure and organizational agility. There is a perception that a successful IT professional blends technical knowledge with a sound understanding of the business while also commanding effective interpersonal skills (Todd et al., 1995). Such skills are critical for an IT group to interact with different business units (Bharadwaj, 2000; Fink and Neumann, 2007) because business units are in a position to effectively utilize technology in their strategies and everyday work. Hence, the ability of IT professionals to build relationships with other business units is a core organizational capability (Feeney and Willcocks, 1998). Subsequently, we define **relationship infrastructure** as an organizational intangible resource that is reflected in the ability of an IT group to create a partnership with business units to work together to meet and exploit new business opportunities (Bhatt and Grover, 2005).

The relational/partnership dimension is not new to the IT capabilities literature (Bhatt and Grover, 2005; Kim et al., 2012; Ravichandran and Lertwongsatien, 2005; Wang et al., 2012; Zhang et al., 2008, 2013). However, what we propose to examine in this study is the relationship between IT and marketing units. Considering that data analytics can contribute to the marketing department’s functions, establishing a bond between these two units is advantageous to organizations in terms of successfully exploring data-enabled business opportunities. An example where the two units could cooperate with their competences is in understanding customer preferences through the analysis of customers’ interaction data in online communities (Chau and Xu, 2012). Moreover, analysing product usage patterns over time, such as movie ratings and music listening behaviour (Sahoo et al., 2012), could increase knowledge of customers’ changing preferences, which could eventually help marketers to
achieve more accurate personalized product recommendations and increased customer satisfaction (Park et al., 2012; Sahoo et al., 2012).

Overall, the relationship between these organizational units provides opportunities for knowledge transfer and information exchange (Tsai, 2001). Given that relationships among business unit managers allow the units to access each other’s innovations and resources and thus promote better understanding of collective resources that lead to evolutionary fitness with changing technologies, product-market demands, and competitive realities (Martin, 2010), it can be argued that in organizations where data analysts share their expertise and knowledge with the marketing unit, relationship infrastructure will have a positive effect on organizational agility. Based on the above arguments, we formulate the following hypothesis:

H4: Relationship infrastructure has a positive influence on organizational agility.

Finally, we turn to the moderating influence of environmental turbulence on the relationship between organizational agility and innovation success. As discussed earlier, data analytics enables organizations to track customer behaviours and analyse their preferences (Chen et al., 2012; Simons, 2014). Therefore, it is logical to argue that, in an environment with high turbulence, i.e., high general conditions of uncertainty related to demand fluctuation (Rai and Tang, 2010), data analytics is a proactive tool in the innovation process that can generate new knowledge, aiding in the constant search for new opportunities by continually capturing market information, analysing, and transferring data from customers (Agarwal and Sambamurthy, 2002; Chen, 2010; Lu and Ramamurthy, 2011; Zhang et al., 2008).

In sum, depending on the extent of environmental turbulence, organizational agility, enabled by data analytics capabilities, could have different effects on a firm’s innovative performance. Organizational agility is less of a necessity in a stable environment, and so there is less benefit from agility or less to lose from being slow to react (Tallon and Pinsonneault, 2011). In a stable setting, there are fewer occasions to exercise the options a firm may have to respond to changes, and thus there is less likelihood that agility will have a significant positive effect on a firm’s innovative performance. In a volatile setting, the same degree of agility may have a far higher effect on innovative performance due to the higher degree of market uncertainty (Miller et al., 1996; Miller and Chen, 1996; Sambamurthy et al., 2003). Hence, we argue that organizational agility is more valuable in an environment with quick changes and where constant monitoring of the occurring events is essential, whereas its effect on successful innovations is relatively low in less uncertain environments, where fewer occasions exist in which a firm needs to actively react to new business opportunities. This leads us to propose the following:

H5a: The influence of organizational agility on innovation success is higher when environmental turbulence is high.

H5b: The influence of organizational agility on innovation success is lower when environmental turbulence is low.

4 Research Methodology

In order to test the proposed hypotheses, we are collecting data through a web-based survey (Groves, 2004). To measure the variables, we use existing and new 7-point Likert scale items, ranging from -3 (strongly disagree) to +3 (strongly agree). For a more detailed description of the preliminary survey items, which are based on extant literature and adjusted to the context of this study, please see Shuradze and Wagner (2016). For development of new items, we followed the same procedure performed by Gerow et al. (2014).
As our target group, we chose to contact business analysts/developers because these people are personally in charge of developing new business opportunities; they are operating on a managerial level, defining long-term strategic goals, and are the primary users that have access to or utilize analytics (Henschen, 2014). In addition, they work in interdisciplinary teams in close relationship with marketers and technical staff and have the ability to observe the relationships between them. In order to approach the respondents, we used an online German professional networking site, Xing (www.xing.com).

After collecting data, in order to test the proposed hypotheses, we intend to apply structural equation modelling (SEM) (Götz et al., 2010). We chose this approach because it simultaneously enables us to (1) model relationships among multiple independent, dependent, and other variables; (2) construct unobservable latent variables; (3) estimate the dependency among variables in the model; and (4) statistically test theoretical assumptions against empirical data (Chin, 1998; Delmas and Toffel, 2008). Because our study has an exploratory aspect, we will use the partial least squares analysis technique, which is preferred in this case over other SEM types, i.e. co-variance-based SEM (Gefen et al., 2011).

5 Expected Theoretical and Practical Contribution

By answering the research question: How are data analytics capabilities related to agility and innovation success?, we expect to make several theoretical and practical contributions.

In particular, considering the rapidly emerging data-rich business environments and companies’ need to make sense of the available digital data for formulating their strategies, we expect the following contributions. First, we conceptualize data analytics capabilities as a specific type of IT capabilities that could have an effect on business strategies and firm performance, which responds to calls made earlier (Wang et al., 2012). In addition, we expect to demonstrate that data analytics capabilities will influence organizational agility and a firm’s innovation success. With these results, our study will complement previous IT-agility research by improving the understanding of ‘potential capabilities’ (Lee et al., 2015, p. 412) that could lead to agility in contemporary data-rich environments (Kohli and Grover, 2008; Lu and Ramamurthy, 2011).

While we primarily focus on contributing to the IT-agility conversation, shedding light on how to develop organizational capabilities that harness large quantities of digital data is also an important question for organizations developing their digital business strategy (Bharadwaj et al., 2013). In addition, the results of the study can answer an open question in the new product development field: How can companies improve their analytical capabilities in data-rich environments (Bharadwaj and Noble, 2015)?

This study also contributes to management practice. First, we expect to demonstrate how companies are able to govern their data analytics-related resources to become agile and innovative using available data resources. This could inspire organizations that struggle with understanding and deciding what to do with the large amount of accumulated data (Goes, 2014). Second, we expect to demonstrate how managers, according to their business environments, can evaluate the importance of incurring costs related to the development of data analytics capabilities.

References


