Digital Capabilities as Driver to Digital Business Performance

Emergent Research Forum Papers

José Carlos da Silva Freitas Junior  
Federal University of Rio Grande do Sul  
freitas.junior@ufrgs.br

Antonio Carlos Gastaud Maçada  
Federal University of Rio Grande do Sul  
acgmacada@ea.ufrgs.br

Rafael Alfonso Brinkhues  
Federal Institute of Rio Grande do Sul  
rafael.brinkhues@caxias.ifrs.edu.br

Gustavo Zimmermann Montesdioca  
Federal University of Rio Grande do Sul  
gustavo.percio@ufgrs.br

Abstract

We are currently dealing with the challenges of a digital economy as well as a digital transformation. Furthermore, digital technologies are reshaping traditional business strategy and also transforming the structure of social relationships for both the consumer and the enterprise. However, we still do not have an in-depth discussion on what skills and abilities are required for the emerging digital economy that can help organizations to cope with these new challenges. So, the objective of the research is to propose a model with digital capabilities as a driver related to digital business performance, particularly in e-commerce and e-business. Our research is expected to make several contributions, bringing some initial results from the qualitative part of the study and presenting a model which will be empirically tested in the near future. The practical value of this research rests on demonstrating the impact of digital capabilities on digital business model performance.

Keywords

Digital capabilities, digital technologies, digital business performance

Introduction

We are currently dealing with the challenges of a digital economy as well as a digital transformation. These challenges were announced at the beginning of this century by Zimmermann (2000), who defined a digital economy to be an economy based on the digitization of information and its respective information and communication infrastructure. According to the author, this new type of economy implies challenges and opportunities, thus making it necessary for organizations to overcome the barriers imposed by the digital transformation and to take the opportunities that come with it. To cope with this new context, it is required to develop capabilities.

Furthermore, digital technologies are reshaping traditional business strategy as modular, distributed, cross-functional, and global business processes that enable work to be carried out across boundaries of time, distance, and function. These technologies are also transforming the structure of social relationships for both the consumer and the enterprise with social media and social networking (Bharadwaj, El Sawy, Pavlou, and Venkatraman 2013; Kohli and Grover 2008).

These transformations modify the processes and structures within and among businesses, increasing the relevant role of digital capabilities. According to Aaker (2015) and Yoo (2013), firms are interested in the discussion on transformation in the digital age, thereby leading IS research to advance theoretically. However, we still do not have an in-depth discussion on what skills and abilities are required for the emerging digital economy that can help organizations to cope with the new challenges in business.

To fill this void, our research is expected to make several contributions. First, we conceptualize digital capabilities based on the digital literature. Second, our study advances on identifying the key digital capabilities required for a digital business model to be successful in e-commerce and e-business. Third,
we intend to contribute to the IS literature by bringing some initial results from the qualitative part of the study and presenting a model which will be empirically tested in the near future. The practical value of this research rests on demonstrating the impact of digital capabilities on digital business performance.

The objective of the research is to propose a model with digital capabilities as a driver related to digital business performance, particularly in e-commerce and e-business. This paper opens with the theoretical development of the research-in-progress. The hypotheses and research model are then proposed. Finally, the method and the preliminary results are examined.

**From Digital Transformation to Digital Economy**

The digital era has brought many changes to society in general. Digitization refers to the encoding of analog information into digital format. We notice that all forms of content, such as books, music, photos, maps, etc., are now available in digital format. As a result, the level of digitization in our everyday socio-economic system is increasing and involves representing, processing, storing, and communicating the widest possible range of matter, energy, and information (Lyytinen, Yoo, and Boland Jr. 2016; Yoo 2012).

According to Aaker (2015), most firms are struggling to get digital right, and they recognize that digital is a powerful device for building brands and strengthening relationships because it has a unique capability to engage people and communities. Consumers are demanding more powerful, faster devices to communicate messages, while businesses are seeking cutting-edge, cost-effective tools to cope with complex challenges (Chekwa and Daniel, 2014). Thus, firms must be prepared, and it is why we want to show how capabilities will help firms to cope with all these challenges of the digital economy.

**Systematic Review of the Literature on IS Capabilities**

The theory that we selected for this study is the Dynamic Capabilities (DC). According to Eisenhardt and Martin (2000) are defined as the ability to integrate, reconfigure, gain, and release resources to match and even create market change. DC explores the velocity of the information, presenting its relationship with organization processes and people. Karimi and Walter (2015) argue that DC is positively associated with building digital capabilities which is explained next.

**Digital Capabilities**

To develop this study, we conducted a full-text search to find articles containing the terms “Digital Capability” and “Digital Capabilities” in the Association for Information Systems (AIS) “basket” of eight top IS journals, namely: European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of the Association for Information Systems (JAIS), Journal of Information Technology, Journal of Management Information Systems, Journal of Strategic Information Systems, and MIS Quarterly. Additionally, we searched in the Ebscohost and Google Scholar. We identified 33 papers in the first round and excluded nine articles due to overlap, resulting in 24. Only six papers underline a clear definition for digital capabilities, as presented in the table below.

<table>
<thead>
<tr>
<th>Journal</th>
<th>Definitions for Digital Capabilities (Concepts)</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS Quarterly</td>
<td>Can be conceptualized as services that one system provides to another through value-creating provider-user interactions; can also be conceptualized as a digital outcome or service.</td>
<td>Srivastava and Shainesh (2015)</td>
</tr>
<tr>
<td>JAIS</td>
<td>The internal ability of providing information to the customers in the instant required.</td>
<td>Kohli and Grover (2008)</td>
</tr>
<tr>
<td>Information Systems Journal</td>
<td>The capacity of a self-contained (digital) system to generate new outputs, structures, or behaviors endogenously through the participation of uncoordinated third-party actors without deliberate planning from the originator of the system.</td>
<td>Lyytinen, Yoo, and Boland Jr. (2016)</td>
</tr>
<tr>
<td>MIT SLOAN Management Review</td>
<td>The skills needed go beyond pure IT to include specific technologies, such as social media or mobile, as well as the analytic skills to drive value from big data.</td>
<td>Westerman, Bonnet, and McAfee (2012)</td>
</tr>
<tr>
<td>Organization Science</td>
<td>The skill to design and control multiple products or subsystems using the same digital tools that in the past would have required different tools.</td>
<td>Yoo et al. (2012)</td>
</tr>
</tbody>
</table>

**Table 1. Definitions of Digital Capabilities**
The definitions in Table 1 define the topic as capabilities and abilities that allow the organizations to give instantaneous answers either internally or externally, using digital channels that contribute to generate value to the company. These capabilities permit improvement on the processes and customer relationships, thereby refining the performance of digital business, impacting operational and strategic fields (Schwarz, Kalika, Kefi, and Schwarz 2010), as we demonstrate in the following hypotheses.

**Development of the Hypotheses**

**Skills and Resources Required for Digital Capabilities**

**Agility and Responsiveness**

Kohli and Grover (2008) argue that agility and responsiveness are two capabilities required to answer the market competition. In this sense, digital capabilities act as a foundation upon which other firms can develop complementary products, technologies, and services (Barrett et al. 2015). In this context, agility is a capability of organizational process flexibility and flexible and fast implementation of operational changes, in addition to digitized process reach, customer agility, entrepreneurial alertness (related to e-marketplace development/launch) (Kohli and Grover 2008; Barenfanger and Otto 2015).

Responsiveness is a capability related to the need for managers who are able to integrate, build, and configure internal and external competencies to address changing environments, according to Karimi and Walter (2015). Consequently, digital capabilities enable learning-by-doing and react to new information technologies. It implies the need for agility and responsiveness capabilities (Barenfanger and Otto 2015; Setia, Venkatesh; Joglekara 2013). So, we propose the following:

**H1 – Agility positively influences digital business performance**

**H2 – Responsiveness positively influences digital business performance**

**Multi-channel ecosystem connectivity**

Tan et al. (2015) and Barenfanger and Otto (2015) argue that Multi-channel ecosystem connectivity is a digital capability. Dong, Hussain, and Chang (2007) note that the goal of digital ecosystems is to improve communication efficiency among internal agents and to structuralize the existing Business Ecosystem. The ecosystem architecture can be constructed based on the firm’s characteristics—its needs, internal and external clients, suppliers, etc.—or it can be adapted. In addition, this Multi-channel ecosystem connectivity allows for condensing information from all corners of the IT organization (Garbani 2015). According to Tan et al. (2015) and Yoo et al. (2012), ecosystem capabilities enable a firm “to search, explore, acquire, assimilate, and apply knowledge about resources, opportunities, and how resources can be configured to exploit opportunities”. So, we propose the third hypothesis.

**H3 – Multi-channel ecosystem positively influences digital business performance**

**Visualization and Governance**

According to Lyytinen, Yoo, and Boland Jr. (2016) digitization makes it possible to radically reconfigure the design and production of nearly all industrial-age products. In this sense, visualization is the capability of displaying business information visually (Yoo et al. 2012). The authors also suggest that visualization capability allows the organization to reduce information complexity and uncertainty, bringing data and information in an appropriate format.

Besides visualization, the governance of all data and information is another capability required of organizations due to exponential data growth (Westerman, Bonnet, and McAfee 2012). This is more evident in recent years, when the pace of data growth has begun to outpace the rate of decline in hardware costs, causing total storage spending to climb and transforming the role of governance (Tallon, Ramirez, and Short 2013). Setia, Venkatesh and Joglekara (2013) complement this idea by noting that the role of governance in a firm’s digital business strategy leverages customer-side digital technologies. Thus, we present these hypotheses.

**H4 – Visualization positively influences digital business performance**

**H5 – Governance modeling and architecture design positively influence digital business performance**
To finish the model, we propose hypotheses 6 and 7. Hypothesis 6 argues that firms with higher levels of business process performance will see a direct impact on Digital Technology ability and on the process to make deep strategic changes to the organization. Hypothesis 7 aims to show that business performance enables the firm to reconfigure resources at the operational level (Eisenhardt and Martin 2000); therefore, we expect performance that derives from IT-enabled business processes to lead to operational impacts (Schwarz, Kalika, Kefi and Schwarz 2010).

H6 – Higher levels of digital business performance will strategically impact the business.
H7 – Higher levels of digital business performance will operationally impact the business.

![Figure 1- Research Model](image)

**Methods**

The research method employed multiple-case study of five organizations within the context of Digital Business Strategy: a bank, two retail companies, a global service organization, and a university. The protocol for multiple-case study was validated by three industry specialists that made contributions to improve it (protocol is available upon request). The sample was intentionally collected on organizations of different sizes and industry sectors to improve the generalization of the study (Benbasat et al. 1987). In each case, the respondents are executives in the fields of IT, business, and company strategy. The interviews are transcribed and analyzed by utilizing the content analysis technique (Bardin 1977). The analysis is in progress, with the use of the qualitative analysis software NVIVO®. As a final step in the qualitative phase, the triangulation of data will be performed using content from the interviews, documents and observations.

After we conclude the qualitative phase, the hypotheses will be tested using quantitative approach with partial least squared based structural equation modeling (PLS-SEM) (Hair, Ringle and Sarstedt 2011). The collection will be carried out in organizations that are within the same digital context, in addition to the companies in the case studies. The respondents will once again be executives of the aforementioned areas. The survey will be elaborated based on results of qualitative phase in progress and literature review.

**Preliminary Results**

The first interviews of the case studies reveal a consistent relationship among the variables proposed in the research model. The CIO of the biggest Brazilian National Retail Company pointed out:

“The company and its strategy can be compared to an iceberg. The top part, what appears to the clients, is the result of the bottom part, which can illustrate the presence of digital capabilities, since the majority of them are intangible—with the exception of the ecosystem, which is more tangible.” He highlights that performance is linked to the client’s experience through digital media, such as online shopping websites, shop applications, among others. The IT Director of the University in the study noted “that digital...
Digital Capabilities as Driver to Digital Business Performance

capabilities drive forward digital business, such capabilities as agility and responsiveness are more related to process, in that agility is more connected to flexibility and responsiveness to client response.”

In sum, both the validation of the model and the cases analyzed up to the present moment indicate that Digital Capabilities can help companies to develop a digital Business Model to improve its e-commerce and e-business.

REFERENCES


Yoo, Youngjin. 2013. "The tables have turned: How can the information systems field contribute to technology and innovation management research?.”Journal of the Association for Information Systems (14:5), pp. 227.