IT Ambidexterity, Organizational Agility and Information Management Capability: a Brazilian Case

Abstract

The aim of this research-in-progress is to evaluate the relation among information Technology (IT) ambidexterity, organizational agility, and information management capability (IMC) into informational flow at Energy and Development Regional Cooperative from Litoral Norte (COOPERNORTE) in Brazil. COOPERNORTE is a non-profit organization that buys electric energy and distributes to almost six thousand associates in the countryside of Viamão county. This organization provides energy to populations not attended by commercial organizations. The cooperative is investing in new IT resources and solutions to improve service delivery. However, some processes still require existing IT resources to keep working, for instance, the electrical network repair and maintenance process. The organization’s challenge is to manage information of these processes, exploring new IT resources and current solutions to improve agility on energy restoration. This research applies a diagnostic case study from new relations in the IS literature. This preliminary step will subsidize future interventionist research.

Keywords

IT Ambidexterity, Agility, Information Management Capability, Regional Development

Introduction

Worldwide IT (Information Technology) spending has been showing signs of slowdown, stagnation, or even overall reduction in some areas (Gartner, 2018). The same phenomenon has been perceived in Brazil (IT4CIO, 2018; GVCIA, 2018); thus, IT managers need to develop the ability within their organizations to exploit new IT resources along with pre-existing ones. Ambidexterity emerges as an organizational capability that allows value extraction from the synergy that results from the management of new and pre-existing resources simultaneously. Such capability meets the needs of an IT market in which investments are increasingly limited. Lee et al. (2015) define IT ambidexterity as the ability of an organization to simultaneously exploit new and pre-existing IT resources and practices. Such a concept comes from a definition that addresses organizational ambidexterity as the critical capability affecting business performance (Gibson & Birkinshaw, 2004).

As another capability to be developed, Information Management Capability (IMC) positively impacts the performance of the firm when mediated by other organizational capabilities (Mithas et al., 2011). Agility is
another capability with an acknowledged impact on organizational performance (Roberts & Grover, 2012; Lu & Ramamurthy, 2011). This is defined as the ability of an organization to perceive and promptly respond to environmental changes (Overby et al., 2006). Agility has also been highlighted as resulting from IT resources and capabilities (Lu & Ramamurthy, 2011).

The aim of this research-in-progress is to evaluate the relationships among information Technology (IT) ambidexterity, organizational agility, and information management capability (IMC) at Energy and Development Regional Cooperative, part of Litoral Norte (COOPERNORTE) in Brazil. COOPERNORTE is a non-profit organization that buys electric energy and distributes it to almost six thousand associates in the countryside of Viamão county. This organization provides energy to populations not provided for by commercial organizations. The cooperative is investing in new IT resources and solutions to improve service delivery. However, some processes still require existing IT resources to keep working, for instance, the electrical network repair and maintenance process. The organization’s challenge is to manage information regarding these processes, exploring new IT resources and current solutions to improve agility in energy restoration. Our study makes two contributions to literature and to local social development. We propose an exploration of the relationship between IT ambidexterity (Lee et al., 2015) and IMC (Mithas et al., 2011), something that has never been analyzed before. Withal, we simulate helping a local non-profit organization to perceived improvement opportunities in their informational systems. This paper opens with a theoretical propositions development, then, the case study method is detailed, and, finally, the preliminary results are discussed. This first step will subsidize future interventionist research.

Literature Review and Development of the Prepositions

Resource-Based View (RBV) will therefore be considered as the theoretical basis for studies on capabilities (Barney, 1991; Grant, 1991). The three capabilities of this study will be analyzed from this perspective. Another extension of RBV that will be further discussed below, since it is central to this paper, are the dynamic capabilities (Teece et al. 1997; Eisenhardt and Martin, 2000). This approach goes further than RBV in the sense that it considers that additional attributes must be linked to abilities in dynamic environments.

Information Management Capability and Organizational Agility

Information Management can also be analyzed as organizational capability. Mithas et al. (2011) suggest a definition for IMC. Based on an extensive secondary database, they conclude that three management capabilities (customers, performance and processes) mediate the positive influence of IMC on organizational performance. Such concepts are defined in three dimensions, namely: (a) the ability to provide data and information to users with appropriate accuracy, punctuality, reliability, security, and confidentiality levels; (b) the ability to provide connectivity and universal access at adequate range and scale; and (c) the ability to adapt organizational infrastructure to the needs and directions of the emerging market. Huang et al. (2012) analyze the process of how information management helps companies achieve agility with customers. They support the observation that “the information management capability is in fact a fundamental capability that enhances other organizational capabilities” (Mithas et al. 2011, p. 251). Mithas et al. (2011) and Graupner & Mädche (2012) together propose a model where IMCs play a mediating role in IT integration capability, thus impacting other organizational capabilities (Brinkhues et al., 2017; Kathuria et al., 2017).

P1 - Information Management Capability is positively related to Organizational Agility

IT Ambidexterity and Organizational Agility

Lee et al. (2015) define IT Ambidexterity from March’s (1991) exploration and perspective. This construct was conceptualized as the ability of an organization to simultaneously exploit new and pre-existing IT resources, and it is divided in two dimensions, as follows: exploitation and exploration. Therefore, the goal is to perceive the problem and to transmit it quickly to other areas in order to boost access to solutions, changes, and new knowledge in a fast and effective way. The effects on dynamic environments are even more significant (Lee et al., 2015). The simultaneous or balanced pursuit of both operational exploration and exploitation activities, i.e., operational ambidexterity, increases organizations’ agility by providing a higher flexibility level to respond to market complexity and diversity. Organizations presenting IT
Ambidexterity enhance their organizational agility through the mediated effects of operational ambidexterity. Dynamism in the environment affects such relations in the organization (Lee et al., 2015).

P2 - IT Ambidexterity is positively related to Organizational Agility

**IT Ambidexterity and Information Management Capability**

IMC has a positive impact on the performance of organizations (Carmichael et al., 2011; Mithas et al., 2011). This capability can be understood as the set of skills articulating the infrastructure and architecture of the access to and distribution of information, which together enable organizations to make organizational adjustments in response to changes imposed by internal and external environments (Brinkhuês et al., 2017). According to Gregory et al. (2015) and Leonhardt et al. (2017), ambidexterity solves paradoxical tensions in some IT areas, such as changes in IT architecture (the ability to achieve both (A) IT integration, i.e., to focus on reusing and integrating pre-existing IT components; and (B) IT replacement, i.e., to focus on fundamental IT renewal by leaving legacy systems behind) and IT program planning (the ability to achieve both (A) IT program agility, i.e., to be responsive to strategic and contextual changes in the IT program; and (B) IT project stability, i.e., to assure a stable foundation for the implementation of the IT project). The IT ambidexterity dimensions (exploration and exploitation) allow environment to remain less prone to tensions, since, by acting in several IT areas, organizations can solve issues related to both new and pre-existing resources. The re-use of such information improves the information management capability, since it allows for the identification and collection of information. In addition, a study by Gregory et al. (2015) and Leonhardt et al. (2017) shows that IT ambidexterity solves tensions in IT architecture, which is primarily responsible for organizing and mapping information. Thus, the current proposition lies in solving the herein presented paradoxes through the use of IT ambidexterity, since such paradoxes (Gregory et al., 2015; Leonhardt et al., 2017) are linked to the IMC of organizations. Therefore, higher IT ambidexterity levels lead to higher IMC levels.

P3 - IT Ambidexterity is positively related to Information Management Capability

**Figure 1. Propositions, dimensions and categories**

Figure 1 was built by the authors considering the literature review above. It depicts the relations to be analyzed in the three propositions and presents the dimensions and categories adopted in the content analysis, which will be detailed in the methodological procedures.

**Method**

This research will perform a case study on a non-profit organization. To carry out this strategy, we will use Benbasat et al. (1987); Lee (1989); Miles and Huberman (2002); and Creswell and Creswell (2017) as guidelines. This phase of the research can be characterized according to Yin (2015), as exploratory and explanatory, as it is intended to identify the relationships among the categories identified at literature review. The organization has been fit to a research context after an IT investment was made last year to reshape the informational flow of COOPERNORTE. However, there is a need to manage these new IT resource with previous existing IT resources in order to maintain their operation and improve service.
delivery. The organization was established in 1975 to attend to 35 countryside residents without access to electricity. Today, there are 5,801 associates covered by more than 850 kilometers of low- and medium-tension network. Two preliminary, semi-structured interviews were conducted with the cooperative’s Executive Director and IT Executive to explore the possibilities of applying the propositions developed based on the literature review to COOPERNORTE’s issues. We then used the respondent-selection strategy known as Snowball (Biernacki & Waldorf, 1981), in which the aforementioned interviewees indicated other employees to be interviewed. We expected to collect about thirty interviews. The interviewees responded to a research protocol containing semi-structured open questions validated by researchers with wide experience on qualitative approaches. Besides the interviews, documents were collected in the organization and through the Internet on the organization’s website and on the regulator governmental agency website. The interviews will be transcribed and analyzed, along with the collected material, by using a content analysis technique. The final (related to the proposed model variables), intermediate (dimensions shown in Figure 1), and initial categories (citations) will be codified. The analysis will be performed with the support of Max QDA qualitative analysis software. It is worth highlighting that the current article corresponds to the initial phase of the research, which will also include a conducting of Action Research to contribute both to the practical concerns of COOPERNORTE’s problematic situation and to the development of IS literature topics.

Preliminary Results

The preliminary interviews indicated electrical network maintenance as the critical process for the organization. To repair damage to cables and transformers, the cooperative spends the largest portion of its expenses. Besides the financial impact, when a repair is not made, associates are not receiving energy at their proprieties and, consequently, the cooperative is not delivering its services properly. Thus, the central object of this study was the process beginning with the information of an interruption in energy provision through to the reception of information indicating the conclusion of network maintenance and the re-establishment of the provision.

IT ambidexterity was observed from the beginning of the process. In this step, new and pre-existing IT resources are used simultaneously. Part of the network is monitored by telemetry; on the other hand, most of the network is not covered by this new technology. In the last case, the cooperative only receives the information if any associate informs the organization about the interruptions. To make this notification, customers can use three channels of communications: telephone calls, website forms, or a mobile app. The switchboard receives this information from one of these channels or automatically from the telemetry system and distributes an order to the maintenance team nearest to the interruption point. The cooperative uses geofencing from team vehicles to locate who is nearest. Maintenance workers also must handle several technologies to make the repair and to send information about the service conclusion. In both cases, this can be done in an online or offline way. Various steps from the process cannot be made by using only new or pre-existing technologies. The capability to simultaneously exploit and explore IT solutions seems to be a key to improving performance in attending to these occurrences. Basically, performance—in this case—means agility with respect to energy restoration. Preliminary analyses indicate that obtaining better performance relies not only on IT resource management, but especially on how the information generated from these technologies is managed. Thus, we can observe relationships developed with propositions research by limiting the scope of this process.

Initial analyses also show a relationship to IMC, which is likely influenced by IT ambidexterity, and which also seems to make sense. Many opportunities to access the same information were made available during the process. How to map and organize this information could be the key to distributing needs-based information promptly and adequately. The first interviewees highlight the relationship between IMC and IT ambidexterity. On the other hand, the relationship between IT ambidexterity and agility is recognized based on the adequacy of internal structure at better composing the resource mix (new and existing IT solutions), and how flexible it can be.

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REFERENCES


