

Meeting halfway

Assessing the differences between the perceptions of ERP implementers and end-users

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Abstract

Purpose – The purpose of this paper is to investigate the large case of enterprise resource planning (ERP) system implementation in Latin America, performed between 2011 and 2015 in a Brazilian, multinational, publicly traded company. Using the organizational change literature as background, this research analyzes the barriers and factors of success by comparing the perspectives of ERP implementers and end-users, identifying success factors and barriers of this project. A conceptual framework is developed.

Design/methodology/approach – The case study method was used to conduct an in-depth analysis of the interviews that captured the complexity of this process. The change management project team had exactly 11 implementers, of whom ten were interviewed, and 45 end-users, of whom 20 were interviewed.

Findings – The results suggest that end-users and implementers have opposite perceptions regarding the role of previous experience, organizational processes, capacity for change, leadership behavior, and the interaction of business units. In general, implementers presented a more critical perception of the change processes. Conversely, implementers and end-users agreed that business needs and cultural values facilitated the ERP implementation, whereas organizational structure and geographic dispersion constrain it.

Research limitations/implications – This research could have analyzed the results by region or by production line.

Originality/value – The major contribution of this research is to offer a conceptual framework to analyze different views about the same project. This study deepens the understanding of ERP implementations by adding studies from other countries and different cultures. For practitioners, this case study aims to offer the experiences and perceptions that implementers and end-users had about the largest ERP implementation system in Latin America.

Keywords Project management, Case studies, ERP, Organizational change

Paper type Case study

1. Introduction

Enterprise resource planning (ERP) systems are software packages designed to integrate business functions and processes throughout a company (Klaus *et al.*, 2000). These packages are developed to meet the needs of a variety of industries, such as retailers, financial institutions, and industrial enterprises. As a result, ERP brings benefits not only to internal business processes but also to the supply chain management, affecting cost management, and customer service (Yang and Su, 2009). Compared to other information technology (IT) projects, ERP implementation is a unique initiative usually related to radical organizational change (Badewi, 2016; Kumar *et al.*, 2003). It involves the redesign of processes, which is associated with high risks, demands human and financial resources, and changes the way organizations are managed[1]. The latter consequence is particularly important because

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it may lead to deep transformations in several aspects of the organization. Calderón Hernández *et al.* (2009) add that even though some changes focus on specific aspects of the organization, they may indirectly affect other aspects, such as structure, culture, strategy, environment, value, politics, and technology.

Even though ERP implementation has been associated with change management due to its potential to impact an entire organization, Hornstein (2015) asserts that until now organizational change is underrepresented in the project management literature. To enhance the likelihood of success, Markus (2004) claims that IT project management should be combined with the organizational change perspective. The author argues that technology-driven organizational change can be a threat to the organization when it is not aligned with its existing culture and practices. Kim and Kankanhalli (2009) explain that in large-scales IT projects such as ERP implementation, resistance to change is the primary problem.

Nevertheless, understanding the causes of resistance to change in ERP systems implementation is not simple. The complexity comes from the diverse stakeholders involved in this type of project, usually large in scale. Implementers and end-users may have different interests in the ERP implementation, although they frequently work together and actively interact during the project. In addition, a group may be more sensitive to some aspects of the project than the other; besides, the opinion of one group may be more relevant to specific aspects of the implementation. Finney and Corbett (2007) argue that most research on ERP system implementation focuses on the critical factors of success, so that organizations can “get it right.” However, these studies forget to ask the stakeholders what “right” means to them. As Laine *et al.* (2016) suggest, social processes of sensemaking may be required to understand how individuals or groups interpret, make sense, and stay in action in unusual situations (Weick *et al.*, 2005).

The organizational change process that this study explores is the implementation of an ERP at a Brazilian multinational company within the mining sector. In recent decades, Brazilian multinationals have assumed a distinguished position in agribusiness, oil, and mining (Sinkovics *et al.*, 2014). Along with Russia, India, and China, Brazil is a member of the so-called BRIC countries, a bloc of countries poised to exert economic influence in the international market. The ERP project began in February 2011 and lasted for four years, reaching all business units of the company, from production to commerce. It redesigned more than 200 business processes and directly affected more than 24,000 end-users. The ERP was first implemented to integrate the supply chain, drive the revision of processes, enhance the reliability of data collection, and improve the flow of information between the business units. In total, 17 companies were embedded in this project, demanding the development of 168 training courses and 20 workshops. As a result, more than 100,000 employees were trained in this new system.

Based on these numbers, the reader can imagine the complexity of the ERP implementation at this company. The project has two major challenges: dealing with different perceptions of the organizational change, and meeting the expectations of a group that was quite heterogeneous in terms of familiarity with technology and education levels. In addition, because the company operates in more than 30 countries on the five continents, the geographic dispersion of the business units is also a potential barrier for the project. Only in Brazil does the company operate in more than 50 cities in five Brazilian states. Given the size of the project, this case study has much to offer, helping stakeholders to understand the underlying cognition related to the differences in perspectives of end-users and implementers. Moreover, the results of this research can support stakeholders of ERP projects by identifying the critical success and failure factors of ERP implementation. Businesses with a similar culture can learn from this case to overcome common limitations and replicate successful practices. When compared to businesses with dissimilar cultures, the results of this case study can help to clarify the context specificities of ERP implementation.

Given this brief introduction, this paper aims to compare the perceptions of implementers and end-users during the ERP implementation process. This research intends to contribute to the literature by offering a bilateral perspective of a large-scale ERP implementation. After analyzing hundreds of articles about ERP implementation, Bintoro *et al.* (2015) call for new research initiatives which focus on the interaction between actors rather than giving too much attention to interaction between variables. This study also analyzes the factors of success and constraints of the ERP system implementation, using the organizational change literature as background.

Case research method provides potential insights into the literature because it allows an in-depth understanding of the phenomenon (Yin, 2009). In fact, Klaus *et al.* (2000) posit that case studies have been consistently employed in the literature to investigate ERP implementations. In addition, this study addresses the call from Shanks *et al.* (2000) to deepen the understanding of ERP implementations by adding studies from other countries and different cultures. This study also addresses the calls from Hornstein (2015) to consider the organizational change perspective on the success and failure of project implementations. Specifically, ERP implementation projects which are dominated by engineering perspectives (Panayiotou *et al.*, 2015), the change management approach has much to offer. During the ERP implementation, managers, vendors, and consulting partners have neglected the business processes to meet standard requirements of engineering frameworks (Panayiotou *et al.*, 2015). We claim that using the organizational change perspective helps drawing attention to the organizational business processes, thereby expanding the engineering perspective. In addition, Finney and Corbett (2007) address the need of future research to focus on the perspectives of different stakeholders in ERP implementation regarding change management concepts. Finally, this research can help practitioners understand how implementers and end-users perceive ERP implementation. In turn, managers and decision-makers can minimize staff resistance to change and enhance the likelihood that the process will succeed.

2. Literature review

2.1 Organizational change management

The success of an ERP implementation depends on several factors. Ram *et al.* (2014) found that internal factors, such as ERP integration and training, are critical factors of success because they bring advantages not only to the ERP implementation project but also to the company as a whole. Some authors argue that organizational culture plays an important role (Jones *et al.*, 2006; Tushman and O'Reilly, 1996), while others draw attention to the involvement of leadership (Dezdar and Ainin, 2011). Nonetheless, most researchers emphasize that behaviors that are resistant to organizational change are strongly related to change effectiveness (Avey *et al.*, 2008; Badewi, 2016; Garg and Garg, 2013). According to Greenberg and Baron (2008), employees resist proposed change when they perceive a threat to the status quo. Changes to the current situation usually require changes to employee work habits and behaviors, which can cause insecurity, fear of the unknown, and fear of losing their jobs or bonuses.

In particular, Garg and Garg (2013) identify the causes of ERP implementation failure in developing countries as follows: resistance to change, inadequate human resources, weak involvement of users, the project team's lack of ability, lack of leadership support and commitment, among others. Failure occurs when a project does not reach a sufficient return on investment, or when a schedule delay prevents the achievement of critical goals (Lambe and Tan, 2003). The findings of Kemp and Low (2008) show that employees who participate in change management actions are less resistant to change than those who do not participate in the process.

Nussbaumer and Merkley (2010) assert that the foundation of a change process is communication at all levels because employees are engaged and resistance is reduced.

Especially during the early phases of the process, effective communication can help to break the paradigm and facilitate the change in status quo. In addition, Nussbaumer and Merkley (2010) propose the following set of actions to manage change: use the knowledge of external experts, build a team of stakeholders, create assets to support the change, create communication channels, and lead the organizational culture to reinforce desirable behaviors.

Dezdar and Ainin (2011) add that a successful ERP implementation depends on a genuine commitment from leadership. The leader should be able to inspire and motivate employees to embrace the change by playing an active role in the project and setting the ERP implementation as a high priority. The authors agree that internal communication is critical for transmitting the understanding that the proposed change is necessary, as well as reducing the chances of negative rumors emerging throughout the organization. Similarly, Boonstra (2013) found that formal and informal communication between top managers and employees is one of the leadership behaviors that supports IT strategic projects. Lines (2005) argues that leadership's role as a formal agent of change can reduce resistant behaviors among the staff by up to four times. Employees who are designated with the authority and leadership to drive the changes help other employees by addressing their uncertainties and indecisiveness.

Organizational culture can directly interfere in the level of employees' resistance, as noted in the change management literature (Jones *et al.*, 2006; Schniederjans and Yadav, 2013). In manufacturing organizations, Haffar *et al.* (2014) found that change initiatives are strongly influenced by the organization's dominant culture. The authors used the framework of Cameron and Quinn (2011) to conclude that cultures based on clan and innovative traits are associated with high levels of engagement due to their informal and flexible characteristics. On the other hand, hierarchical and market cultures are related to low levels of readiness for change.

Chu (2003) asserts that a proposed change can possibly not go smoothly if the culture of the company does not foster innovation. Further, if organizations insist on ignoring their own cultural features, planned and proposed changes are likely to be superficial and short-term. For changes that are culture-oriented, employees have different beliefs (Chu, 2003). In these settings, employees feel responsible for the outcomes of the changes because they are engaging in collaborative behavior. On the contrary, successful and older organizations may develop cultural traits that are averse to change. Tushman and O'Reilly (1996) refer to this as cultural inertia. The authors explain that due to institutionalized norms and values that have worked well enough over time, organizational culture can become a barrier to change. Employees resist simply because the current way of doing things has been proven to be the right approach.

2.2 Change resistance

We must also consider the other side of the story. Several authors, including Ford *et al.* (2008) and Van de Ven and Sun (2011), claim that looking only at the organization's point of view may result in a biased perspective. With this approach, which positions the organization as the major change agent, the organization is responsible for the emergence of resistant behaviors. When changes are planned, the organization breaks its pre-established contracts with its employees, violating trust. Therefore, resistant behaviors emerge from the failure to restore employee confidence and legitimize new contracts (Ford *et al.*, 2008). Planned changes are less likely to face resistance when organizations have the opportunity to correct or overcome undesirable results during the process.

Social relationships inside the organization are the backdrop of this process, making it highly dependent on the given meanings that are socially constructed among teams. Shared meanings materialize through collective sensemaking, which is dependent on social interaction, language, and communication (Weick *et al.*, 2005). Social activity systems within organizations supply employees continuous stimulus to interpret and reinterpret situations. In new conditions, behaviors once considered correct may be reinterpreted and changed

(Weick and Roberts, 1993). Communication is also a central component of sensemaking because employees share a common language in everyday interaction. It is through communication that co-workers transform complex and individual tacit knowledge into simple and shared explicit knowledge (Weick *et al.*, 2005). The socio-cognitive processes may give valuable insights into mechanisms that inhibit or facilitate employees' initiative to adapt to organizational change (Hodgkinson and Healey, 2008).

Laine *et al.* (2016) add that social process of sensemaking happens at both levels, the implementers (represented by managers) and end-users (key project team members). Managers are more likely to develop mental representations, which translate patterns of values and beliefs across the organization (Hodgkinson and Healey, 2008). In addition, managers are expected to be more committed to organizational outcomes, like productivity and financial performance, due to their differentiated reward system and perceived status quo. Hence, the perceptions of ERP implementers and end-users may vary substantially. Boonstra (2006) posits that stakeholders such as managers and users can react differently by accepting or rejecting the new IT system. On the other hand, the author adds that "designers construct the system according to priorities and expectations" (p. 4). As IT is highly sensitive to human interpretation and expectations (Orlikowski, 1992), implementers and end-users may have different motivations related to the ERP system implementation.

2.3 Change management in ERP implementation

Change management that is aligned with organizational culture can reveal the critical success and failure factors of ERP implementation. "As the field shown, there are strong tendencies within institutionalized practices that constrain and facilitate certain developments and deployments of technology" (Orlikowski, 1992). Previous experience with ERP implementation can directly affect the way employees react to the new one. Business needs and organizational structure, as well as organizational process maturity and organizational capacity for change, are critical factors that can set boundaries or facilitate planned changes. Determinants of organizational culture, such as mission, vision and values, leadership behavior, and business unit interactions, may also determine how implementers and end-users perceive the ERP implementation. Change management categories include the following:

- (1) Previous experience implementing technology-driven projects. The researched organization has previously implemented an ERP system. The negative experience with similar processes can raise barriers to the new one (Greenberg and Baron, 2008). Conversely, previous experience can help implementers and end-users overcome the undesirable outcomes of the first implementation (Armenakis and Bedeian, 1999).
- (2) Business needs for the new ERP system refer to employee perceptions and the socially constructed meaning of this implementation. The resistant behavior occurs when individuals do not recognize the need for change (Van de Ven and Sun, 2011). Because this is the organization's second ERP system, employees might perceive it as unnecessary. If communication between managers and employees is not effective, end-users and implementers may not be aware of the organization needs and, as result, they do not commit.
- (3) Organizational structure: organizations that act in a stable environment, similar to this one, tend to be highly hierarchical, in which decision making may be slow and sometimes ineffective. If on one hand highly hierarchical structures may constrain the flow of communication, on the other hand it may help employees to define responsibilities and be aware of their range of action in the process of organizational change.

- (4) Organizational processes are the internal procedures and routines that are affected by the ERP system. One of the reasons the organization decided to implement the new ERP system was to begin the revision and improvement of internal processes. Therefore, employees can perceive that the maturity level of these processes is low, justifying their need to review them.
- (5) Organizational capacity for change refers to the organization's preparation for the change, such as building teams to lead the process, creating communication channels, and using external resources, such as expert consulting companies. Boonstra (2006) suggests that business units have different visions and assign different meanings to ERP systems.

Weick and Roberts (1993) draw attention to the role of organizational culture in building collective mind in organizations. The notion of collective mind refers to a pattern of interrelations in a social system directed by conscientious and careful behaviors. In organizational cultures that cultivate cooperation and care, employees are more likely to envision contributions for joint action (Weick and Roberts, 1993). It means that, employees feel they are member of a team and their behavior impacts the whole system. Moreover, because they are aware of their responsibilities and abilities, they rely on each other. It helps smoothing coordination and subordination in organizational change processes. Organizational culture categories include:

- (1) Mission, vision, and values. Organizational culture can become a barrier or a facilitator of change management. Organizational culture defines the institutionalized norms and values that guide the patterns of behavior that are expected from employees.
- (2) Similarly, leadership behavior is also delineated by the organizational culture. Leaders can be supportive by showing true interest in the proposed changes and setting examples for employees (Schniederjans and Yadav, 2013). Otherwise, they can categorize change as a low priority, delegating responsibilities and not getting directly involved.
- (3) Organizational culture also determines the way business units routinely interact and communicate with each other. In individualistic cultures, business units are driven by greater competition among them for resources and prestige, compromising their integration.

Geographic dispersion:

- (4) Finally, as discussed above, geographic dispersion can act as a barrier to the ERP implementation process since the researched organization operates worldwide.

As Bintoro *et al.* (2015) assert, conflict and interactions among stakeholders directly affect the success of ERP implementation. The perceptions of ERP implementers and end-users may offer important insight to theory and practice. The results might provide some indication of success and failure factors of the project by showing how different stakeholders make sense of the ERP implementation process. Based on the literature review, Figure 1 shows the theoretical framework that was developed as an attempt to identify possible categories to support data collection and analysis.

The outcomes of an ERP system depend on several factors that are perceived and interpreted by end-users and implementers throughout the process. These perceptions and interpretations might be similar in some aspects and different in other aspects, characterizing the perspectives of each group. On the change management approach, the factors that directly affect the outcomes of an ERP system implementation are those related

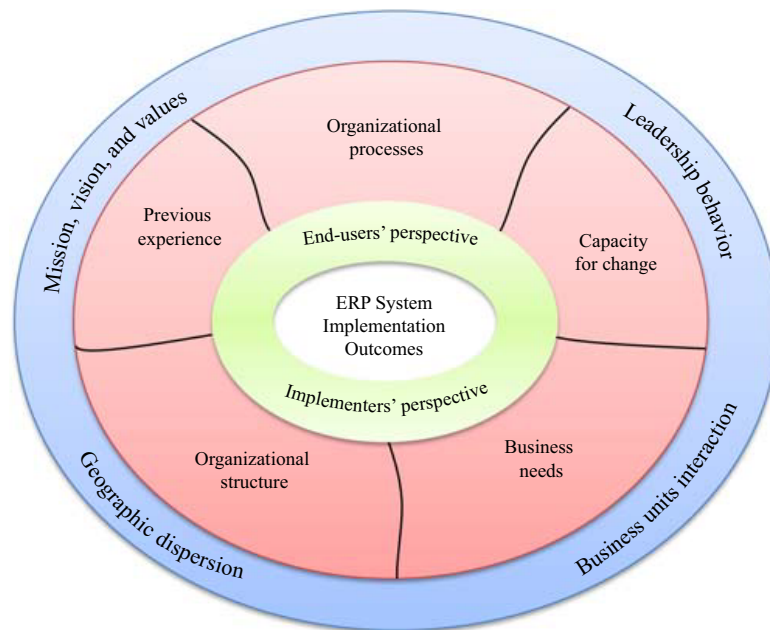


Figure 1.
Change management
framework for ERP
implementation

to business needs, capacity for change, organizational processes, previous experience, and organizational structure. In a macro perspective, leadership behavior, organizational mission, vision, and values, geographic dispersion, and business units interaction are also found to influence the ERP implementation outcomes by affecting the change management categories and the perceptions of implementers and end-users.

3. Methodology

This research uses the case study method to analyze the differences between the perceptions of ERP implementers and end-users by assessing the factors that constrain and facilitate the system implementation. The case study method is a research strategy that uses one or more cases to create theories, propositions, or theoretical constructs from empirical evidence (Eisenhardt, 1989). Yin (2009) explains that case studies are robust empirical descriptions of particular examples of a phenomenon that are typically derived from a variety of data sources.

In this study, we utilized the single case study for a detailed understanding of the meanings that participants give to the phenomenon in their natural environment. The phenomenon studied is the ERP implementation; the participants are the ERP implementers and end-users; and the natural environment is the mining company that is implementing the system. According to Orlikowski (1992), the context is important to understand how the development and use of certain technologies are influenced by different conditions.

We collect data from different sources, such as online information, internal documents, and interviews. For qualitative research, the subjects are selected based on their relevance, and therefore their capacity to provide useful information about the ERP implementation. We contacted the selected employees, explained the research purpose and the voluntary nature of their participation, and scheduled a meeting with them. In this meeting we assured the employees' anonymity and reinforced the voluntary participation.

We individually interviewed 30 employees, of which ten are implementers and 20 are end-users, during the final phase of the ERP implementation process. Therefore, the interviews were performed at the end of the first semester of 2015. An advantage of

using interviews in case study method is to combine real-time cases and retrospective impression and sensemaking. Eisenhardt and Graebner (2007) explain that cross-sectional data collection of interviews in cases studies has the advantage to perform longitudinal approach by asking informants about past events. In this research, these interviews are particularly precise because the events are recent.

At the beginning of this project, the company developed a network that was formed by selected employees who represented their business units during the ERP implementation process. Each director of the 45 business units chose an end-user employee to be a member of this network. This employee was responsible for bridging the business unit and the implementers' team with the following actions: taking specific problems, doubts, and questions from his/her unit to the implementers of the ERP system; following the design of new processes, solutions, and configurations; assisting with the implementation phase; and communicating the project requirements, outputs, and training processes to his/her co-workers. Therefore, we interviewed 20 of the 45 end-users who were selected to become closely involved in the ERP implementation. On the other side, the implementers are known in the company as "change management processes specialists." The change management project team had exactly 11 members (implementers), of whom we interviewed ten. They were responsible for managing the ERP system implementation, facilitating the necessary changes, and reducing the impact of certain changes on the business units' routine.

The 11 members of the change management project are managers from different areas of the company, with high educational level (graduate degree), and more than three years of experience in ERP implementation (five of them have more than seven years of experience). The end-users are also highly educated employees (graduate level), who occupy strategic positions into each business unit of the company. In order to be chosen by each director to represent their business units, end-users have to demonstrate deep knowledge of the unit processes, communication and interpersonal skills, and commitment to the project (desire to be part of the team).

We conducted the interviews only after the ERP implementation was finished. We stopped interviewing employees when we reached a saturation point, meaning after consistent information was gathered, data became repetitive and new interviews were unable to shed any further light on the phenomenon of ERP implementation (Glaser and Strauss, 2012). We recorded the semi-structured interviews while we were also taking notes. Later, a research team transcribed the interviews to perform a data analysis. The qualitative data were first coded into change management, organizational culture, and geographic dispersion themes. Later, we reexamined each theme classifying the data into specific categories identified in the literature review. The research team reanalyzed the transcriptions to reinsure the data represented the categories coded and if any relevant information was left behind. We then performed the content analysis, centered on word meanings, to investigate emerged patterns from the interviews (elements of phrases and words). Content analysis is used to systematize the text analysis based on code systems which are empirically coded to make observations about patterns of information (Babbie, 2015).

The script of the semi-structured interviews was divided into three sections. First, we asked the participant to briefly explain his/her role in the ERP implementation, his/her expectations, and the perceived outcomes of the project. Second, they were asked to evaluate nine items that represented the nine categories that this study identified in the literature review, which are: previous experience, business needs, organizational structure, organizational processes, capacity for change, mission/vision and values, leadership behavior, interaction of business units, and geographic dispersion. We inquired if each of the categories acted as a barrier, facilitator, or were indifferent during the ERP implementation process.

Finally, in the third step, implementers and end-users were asked to identify and evaluate the occurrence of a set of actions designed to manage the proposed change. These actions emerged from the internal documentation, initial interviews, and literature. In the literature, Nussbaumer and Merkle (2010) identify eight key strategies for systematic change implementation: creating a framework for change, leveraging outside expertise, building a leadership team, designing a new organizational structure, influencing the organizational culture, managing transition, forming operational teams and workgroups, and reflections. Using internal documents related to the ERP implementation, we identify four key strategies that the organization developed to manage the proposed change, described in 16 specific actions, which are:

- (1) Strategy: aligning the redesigned processes to business strategy; creating a knowledge environment; designing a new organizational structure; establishing a sense of urgency and short-term activities to business units; and, using outside expertise.
- (2) Leadership: building leadership alliances between directors and having a committed leadership.
- (3) Network: building a qualified project team; forming operations teams; offering effective training programs; and, structuring a network of end-users.
- (4) Communication: communicate short-term achievements, communicate the directions of changes, and the scope, benefits, and objectives of the ERP project; reflecting on why this change is necessary.

These actions were verified during the initial interviews. We used a five point Likert-type scale to assess the 16 items of change management actions that measure the four key strategies, varying from one, which represents ineffective, to five, which represents highly effective.

4. Case history

In February 2011, an official event brought together all of the board of directors, employees, and consultants of external companies to announce the start of the new ERP system implementation. At this event, the company publicized the goals, objectives, guidelines, and benefits of the new ERP system, as follows:

- expand tracking processes;
- enhance information reliability;
- integrate systems into a single database;
- work on the simplification of processes;
- speed the flow of information between the company's business units;
- review and redesign processes; and
- increase integration between the company's operations and business units to streamline operations worldwide.

Nevertheless, this was not surprising news to the employees who, due to past experience, demonstrated little enthusiasm. In fact, they were facing a second implementation of an ERP system in less than six years. According to the members of the new project management team, the first system failed to integrate the business supply chain and neglected other processes. The major arguments the company had to support the decision to deploy another ERP system after such a short period of time were the reputation of the new system supplier and the reliability of the new ERP system.

The largest ERP implementation project in Latin America was planned to be executed in three waves. These steps were defined based on business processes and geographic location. The waves were engineered in parallel, with each including the following five phases:

- (1) Preparation: decision making about business processes and planning the existing processes design and redesign.
- (2) Design: discussion phase, design of new processes, and alignment with business units.
- (3) Configuration: inclusion of the process into the ERP system and reflection about the adequacy of the developed designs.
- (4) Testing: testing phase of the processes on the new platform.
- (5) Implementation: begin production in the new system, and completely shut down old systems.

The first wave covered all business units that are located in the iron ore and pellets production lines in Brazil. All modules of the ERP system – supply chain management, finance and controlling, human resource, quality management, production planning, and so forth – were installed at this stage, with the exception of the plant maintenance module, which was added at a later time. The target date was initially in January 2014. However, there were delays in the design of some processes and the configuration of new solutions, causing the first wave not to end until April 2014.

The second wave took place using a rollout strategy. The company's units were divided into five regions. The first rollout happened only in region 1, which included the port and ore pelletizing processes. The implementation phase, which was the start of the production into the new system, took place only on April 2014 (first planned to start on January 2014). The second rollout, which took place in regions 1 and 2, was planned for ferrous processes, railways, and ore pelletizing. Initially, the implementation phase was scheduled for July 2014. However, this phase had to be postponed to February 2015 due to difficulties in the integration of supply and maintenance modules. In regions 2 and 3, ferrous and port processes were installed into the ERP system in September 2014, indicating the achievement of the third rollout phase. Finally, the fourth rollout covered regions 5 and 6. At this stage, ferrous processes, railways, and ports were installed in the ERP system. This rollout came into operation in November 2014.

The third and final wave was implemented in all five Brazilian regions. In this step, the navigation processes and nickel and copper mining were incorporated into the new ERP system. Overall, the project was delayed seven months due to the lack of integration and the difficulty in designing some processes, requiring rework and an increase in implementation costs. At each start-up line in the new system, the official channels of internal communication informed the staff about what was achieved, reinforced the importance of this project, and explained the expected benefits.

As part of the company's strategic agenda, implementation of the new ERP system was a high cost investment project. In addition, the IT director was a major sponsor of the project. It also had full support from the company's CEO and the directors of human resources, buying, and sustainability areas. However, during the first year of the project, the company underwent a major restructuring. A new CEO took over, along with an entirely new board of directors. Still, the new CEO and board of directors decided that the ERP implementation project was indispensable. They maintained its high priority level, and hence made the necessary investment. At the end of the ERP implementation, 80 percent of the change management team was reassigned to other positions. Next, the company started the "stabilization" project, creating a new area called the Performance Center, which included all of the remaining members of the ERP project team. They were now engaged in monitoring operations, consolidating new processes, and correcting errors in the system.

5. Results and discussion

5.1 Perceptions of implementers and end-users

The interviews reveal that ten out of ten implementers think leadership behaviors and the interaction of business units worked as a barrier to the ERP implementation, while nine of them believe organizational structure and processes also prevented the changes from happening. Only six implementers believe the implementation of the ERP system was facilitated by business needs. On the other hand, 16 of the 20 end-users interviewed feel that leadership behavior, previous experience, and capacity for change facilitated the ERP implementation. According to 14 end-users, the company's geographic dispersion was a great challenge. Another barrier to the ERP project was organizational structure, as revealed by ten end-users. Figure 2 shows the results of the overall perceptions of implementers and end-users regarding the change management and organizational culture categories.

Based on their previous experience, implementers, and end-users have conflicting perceptions. Implementers think the previous ERP system failed to provide successful results. Moreover, the first ERP system implementation demanded huge efforts to run the transition. One of the implementers explains, "[...] the implementation of the previous ERP system was very difficult and it did not bring the expected benefits; which caused end-users to resist the new system." On the other hand, 16 of the 20 end-users interviewed think the previous experience with ERP implementation was positive because it gave them some experience and knowledge to help them implement this new system: "[...] having the experiences of the past ERP project made it possible to contribute more in this system implementation."

The mismatched perceptions between implementers and end-users may indicate how far they have progressed in this project. Both perceptions are somewhat consistent with the theory. As Greenberg and Baron (2008) argue, implementers think the staff's previous experience with implementation created barriers for the new project. End-users think that, even though the first project was not successful, it gave them experience to help them avoid undesirable outcomes and support implementers, as indicated by Armenakis and Bedeian (1999). However, this contradiction reveals that implementers and end-users are not on the same page. This poor level of communication between them suggests that there may also be a gap in other areas of the implementation process, compromising the real needs of end-users.

End-users and implementers agree that, at the time, the company really needed to implement a new ERP system. One of the implementers adds, "[...] even though the company did not have the necessary maturity to run a project with this level of complexity, it was clear that the company needed to reduce overlapped and manual controls. In addition, it also needed to integrate the database into a single system." An end-user agrees: "[...] the company needed to integrate its production chain, there were many gaps in the previous system and the processes were loose. The company needed to change and there was not a

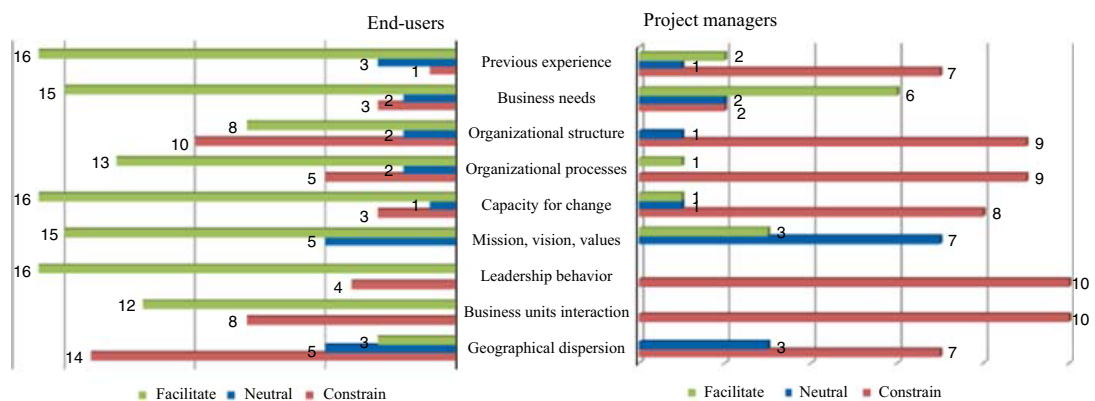


Figure 2. Perceptions of implementers and end-users about organizational change categories

database to do so.” Both examples show that end-users and implementers recognize the need to redesign processes and integrate the company’s database. As Chu (2003) argues, it is important for employees to have awareness of the environment that generates the need for change. Recognizing this necessity helps to increase engagement and reduce resistance.

Organizational structure has been noted as a barrier to ERP implementation by nine implementers and ten end-users. They agree that red tape and slowness in decision making are consequences of the company’s highly hierarchical structure. For example, while waiting for managers to agree, some decisions related to the ERP implementation during the redesigning processes had to be delayed: “[...] there was a lot of difficulty in making some business decisions about processes specificities that were essential to ERP replication.” Hierarchical structures are associated with low levels of readiness to change, negatively affecting the outcomes of the proposed change (Haffar *et al.*, 2014). Specifically, for technological changes, which occur at a different pace, readiness is critical for the implementation process because decisions must be made faster, even the complex ones. Curiously, eight end-users believe that the ERP implementation was facilitated by the company’s organizational structure. They argue that the structure helped them know exactly what to do in critical situations, and helped them define the scope of their responsibilities and performance.

In a highly hierarchical company, processes tend to be well defined and relatively rigid. To implementers, organizational processes were a barrier to ERP implementation: “[...] as the processes were not fully designed and there were not defined areas responsible for some of them. The latter, in a special manner, really hampered the ERP implementation.” Another implementer added, “[...] In addition, such uncertainties affected the training program. The delay in some processes led the training courses to start without really reflecting what was going on at the shop floor. More seriously, the training in general offered a fragmented view of the processes; no one was able to train end-users with a comprehensive view of the production chain.”

In contrast, in this condition of disorder, end-users pictured an opportunity to redesign and organize these processes, thereby facilitating the proposed change: “[...] the implementation was improved because the review of the processes made it possible;” “[...] the disorder and lack of clarity of previous processes may have hampered the redesign of new ones; however, because of this very same disorder, we were eager to have new processes facilitating the ERP implementation.” As the literature claims, ERP implementation is not only a system development, but it also involves managing a complex environment, redesigning processes, structures, and more importantly, dealing with people (Kumar *et al.*, 2003).

Another conflicting result refers to organizational capacity for change. End-users perceive that the company had what was needed to manage such a complex change. For end-users, two factors contributed to this perception. The first one is the fact that the company hired a multinational consulting firm to follow the ERP implementation. Since the beginning of the project, a team of consultants supported the design of new solutions and the redesign of previous processes. The second factor is the deep knowledge that operational areas have on the processes, along with previous experiences of the old system implementation. As a result, end-users knew exactly what they needed in the new system: “[...] we really knew about our processes, that is why we were able to ask for specific issues in the system and even question some points of the project.” According to end-users, communication channels were also very effective: “[...] communication channels were essential to identify the units’ needs and develop some initiatives, such as training, helping us with the system.”

On the contrary, implementers perceive the company to be unprepared, mainly because end-users and operational teams had not consolidated knowledge about some processes.

External consulting was helpful, although “[...] most of the consultants worked with us [the implementers] designing and setting new processes in the system, they did not allow knowledge transfer to happen. It was frustrating.” Regarding communication, implementers add, “[...] there is no point in communicating if the information is not useful to end-users or if the information is outdated. Working with information like this is to risk losing credibility”; and “[...] the information offered in the internal media about the project was superficial, it should have offered what changes in the operational processes were going to happen instead. The timing was wrong too, end-users did not have enough time to ask questions and be prepared.”

Organizational culture permeates the way organizations structure themselves, organize their processes, and motivate desired patterns of behaviors. In general, perceptions of the company’s mission, vision, and values were neutral from the implementers’ points of view and positive from the end-users’ perspective. End-users acknowledge that “[...] in this competitive environment, the company needs to give a fast response to the market; this project could give enough visibility and integration to keep meeting the company’s vision.”

Leadership support is a critical factor for any organizational change (Chu, 2003). If leaders are not involved in the process, employees tend to categorize the proposed change as a low priority. In this case, implementers believe managers and team leaders did not consider the ERP implementation to be a strategic initiative of the company: “[...] managers, in general, did not realize how important the project is until the very last moment. The project seemed to be a part of the real strategic agenda of the company, despite some initiatives to raise awareness. Many managers and leaders did not understand the importance of several requests we had, therefore they took no action to find a solution, failing to address them.” The end-users have a different view that is limited to their participation in training programs: “[...] directors, managers, and leaders were committed to the projects because they supported the participation of employees in training.” However, end-users admit that “[...] the leaders were not worried in building alliances, they were just thinking in their boxes, you know, concerned only about their space. However, they were favorable to the changes.”

The contradictory perceptions between implementers and end-users also repeat when the interaction between business units is in the spotlight. According to implementers, the lack of communication between operational areas is the major problem: “[...] during the redesign of processes, managers and team leaders did not seem worried about integrating the operation chain. There was no exchange of information between the units during the implementation phase.” The speeches of two end-users illustrates this situation: “[...] there was a gap between units, there was no exchange of information even between processes from different units”; and “[...] every [person in] leadership sees your piece in the process, there is no interaction in high management either. This may be due to the highly competitive climate which dominates the company culture.” In sum, for this project, the company failed to create an environment of cooperation and integration.

According to Senge (2014), organizations must create an ability to learn if they want to change and to get there, they can promote integration between departments. Nussbaumer and Merkley (2010) add that integration brings creative solutions to the proposed change, even during the implementation process. The interviews show that the ERP project was not able to promote the integration and communication between business units. For the end-users who believe the interaction between business units facilitated the ERP implementation, they emphasize that, at some point, they had to talk to employees in other units: “[...] we had to talk to each other to run the operation chain in the system. But, this communication happened between us. Managers and leaders did not get involved.”

Finally, both groups – implementers and end-users – agree that the company’s geographic dispersion was a barrier to ERP implementation. They explain that geographic

location was so critical to the project that the waves of implementation had to be planned by geographic regions. Implementers highlighted that travel costs and working hours spent in transit were considerably high due to geographic dispersion.

5.2 Change management actions and consequences

Using a five-point Likert-type scale, end-users and implementers were asked to evaluate the effectiveness of the 16 management actions grouped in four key strategies that were created to promote the new ERP implementation. Table I shows the results of this evaluation, which varied from a minimum of 2.40 (approximately 48 percent effective) to a maximum of 4.44 (approximately 89 percent effective).

In general, the ERP project has created more discomfort among implementers than end-users. Members of the implementers' team are experienced professionals with an average of 8.5 years of experience. These employees have a more critical view of the business environment, culture, and conditions to launch an EPR system. The implementers draw attention to the complexity of the project, difficulties with decision making, delays in the schedule, lack of a long-term vision, and poor integration between processes. On the other hand, end-users view this project as an opportunity to overcome old problems by improving critical processes. Their major problem was determining how to conciliate their daily activities with the demands of the ERP implementation process.

In relation to strategy, implementers believe that the most effective action is to assign to business units short-term activities that are related to the ERP system implementation (80 percent effective). In order to facilitate the change, the team of implementers asked the business units to execute specific actions: "[...] many actions related to change management were sent to the units and helped end-users preparing for the transition process. We designed the execution plan and end-users executed them, this was critical to 'turn the key' on production processes." And the least effective action was creating a knowledge environment. Usually, the concept of a knowledge environment

Change management actions	Project managers	End-users
<i>Strategy</i>		
1. Aligning the redesigned processes to business strategy	3.17	3.92
2. Creating a knowledge environment	2.40	3.79
3. Designing a new organizational structure	3.33	3.11
4. Establishing a sense of urgency to prioritize the ERP implementation	3.60	4.11
5. Establishing short-term activities to business units	4.00	3.44
6. Using outside expertise	2.50	4.00
<i>Leadership</i>		
7. Building leadership alliances between directors	2.50	4.11
8. Having a committed leadership	3.25	4.16
<i>Network</i>		
9. Building a project team only with qualified and skilled employees	2.80	4.44
10. Forming operational teams to collaborate to ERP implementation	3.33	4.18
11. Offering an effective training program on ERP usage	3.13	3.71
12. Structuring a network of end-users	3.22	4.11
<i>Communication</i>		
13. Communicating short-term achievements	2.50	3.73
14. Communicating the direction of changes in ERP implementation	3.00	3.88
15. Communicating the scope, benefits, objectives of the ERP system	3.30	4.11
16. Reflecting on why this change is necessary	3.00	4.00

Table I.
Perceptions of
implementers and end-
users about change
management actions

refers to a broad meaning, in which practices are designed to build a collaborative atmosphere that creates, transfers, and keeps knowledge inside the company. However, implementers understand that a knowledge environment is limited to actions related to training end-users: “[...] only in-person classes and online training courses are not enough to prepare end-users to use the new ERP system. A training environment outside the classroom should be offered, such as offering in-person and virtual ways to assess individual questions and difficulties.”

For end-users, the least effective action regarding strategy was designing a new organizational structure. End-users recognize that there was a change in the company’s structure. However, they claim that this change was not motivated by the ERP system. Instead, it was a response to the iron ore market, where prices had dropped considerably, leading companies to cut operational costs. As result, end-users add that those structural changes did not happen uniformly throughout the company, and some of them were affected quite negatively by the ERP implementation. The company failed to use the ERP implementation process to drive structural changes because such changes require careful planning to achieve strategic outcomes (Nussbaumer and Merkley, 2010).

Leadership was another point of issue in the interviews. As a whole, the project depended upon leaders and managers to engage employees. Therefore, implementers had high expectations regarding the involvement of leadership. The interviews suggest that leadership was involved in the process, although some of the leaders did not become involved until later. Implementers and end-users agree that leaders negatively influenced the redesign of processes, and they did not allow the operation chain to be integrated strategically. The board of directors noticed how the decision making was occurring. In fact, end-users complained about the decision-making process, including their lack of autonomy to make decisions.

Actions related to network were specifically helpful to implementers who were dealing with the following issues: geographic dispersion: “[...] this is a huge project in a highly geographically [dispersed] environment, the network of end-users helped us understanding in a short period of time the critical issues in each unit”; and the company’s restructuring: “[...] we faced during the ERP implementation a lot of staff relocation. It changed some end-users who were in the network and we had to align all over again, rework. Beyond the formal network formed by the directors’ indication, a parallel and informal network was created by other end-users. We, all the change management team, got really surprised.” To end-users building a project team with qualified employees and forming operational teams were crucial to the project. As one of them explains, “[...] implementers were always available to help business units. They knew what they were doing and they also had the support of a consulting team.”

The objectives of change management actions are to reduce resistance to change, gain employee commitment to the new ERP system, minimize implementation problems, and enhance the likelihood of success. All respondents report that they noticed a certain level of resistance to the new ERP system. They indicate that the employees’ difficulty working with new systems and attachment to old processes and systems are the major causes of their resistance. Moreover, employees had to complete several training classes online and in-person, which increased their workload, and required them to work strict control that was required by the system. Further, “[...] in some departments, managers use the fear as a silent instrument of coercion. Depending on the situation, we did not feel comfortable to express our views or disagree with something.” Actions to mitigate resistance basically focused on training, meetings, and workshops to communicate many benefits that the new ERP would bring. In general, end-users were committed to the project because they envisioned a great opportunity to redesign processes.

6. Conclusions

6.1 Differences between the perceptions of implementers and end-users

The aim of this study is to compare the perceptions of implementers and end-users during the ERP implementation process. This study also analyzes the factors that constrain and facilitate the implementation of the largest ERP system in Latin America, addressing the call from Shanks *et al.* (2000) to add studies from other countries. However, the major contribution of this case study is to examine different perspectives – those of implementers and end-users – on the same phenomenon, as Finney and Corbett (2007) claimed for considering the perspectives of different stakeholders in ERP implementation. We interviewed ten implementers who directly coordinated the implementer teams, and 20 end-users who work in strategic positions, and therefore, were deeply involved in the ERP project.

In general, the findings on the perceptions of different stakeholders indicate that they interpret differently most aspects of ERP implementation, as suggested by Boonstra (2006) and Orlikowski (1992). It seems that within each group collective sensemaking is revealed with the emergence of common perspectives and interpretations of the processes. The interviews indicate that even though there is a constant interaction among different stakeholders, it was not sufficient to build a unique or common view. The first contribution of this paper is to show the existence of differences and the emergence of common patterns within each group, thereby supporting the assumption of Laine *et al.* (2016). To the theory, it has implications not only in managerial cognition in the context of complex projects which require multiple units' efforts, but also in the effects of organizational hierarchy, pressure, and commitment. Managers are expected to be more committed to organizational outcomes while they face pressure to deliver results (Hodgkinson and Healey, 2008). Our study might shed some light in the negative consequences of managerial pressure on collective sensemaking.

To practitioners, these results have two implications. First, in a simplistic approach, one can imagine that the lack of genuine interaction between implementers and end-users is positive because it prevents end-users to be contaminated with the negative view of implementers. Second, following a positive agenda, there is a need to take action in order to reduce the gap between implementers and end-users. Nussbaumer and Merkley (2010) identified that lack of communication may compromise the ERP implementation, as Garg and Garg (2013) drew attention to the weak involvement of users in the context of developing countries. Therefore, the organization needs to put stakeholders in the “same page” for incoming projects. Some problems like lack of leadership support, poor communication, and failure to build a knowledge environment were pointed out by the implementers and can serve as input to reduce uncertainties in future projects. These factors have already been revealed in the literature as major causes of failure in IT system implementation (Boonstra, 2013; Dezdar and Ainin, 2011; Lines, 2005).

The second contribution of this paper relies on the overall organizational culture. The findings support the assertion of Chu (2003) that organizations that insist on ignoring their own cultural features on planned changes miss the opportunity to take full advantage of the changes. The results may also provide some indication that the organization is dealing with some kind of cultural inertia (Tushman and O'Reilly, 1996), in which cultural traits averse to change are developed. The gap between stakeholders, the leadership behavior, and the poor integration between business units, provides some indication that the organization encourages individualism and neglect mindful practices. According to Weick and Roberts (1993), this environment is characterized by mature groups (highly skilled employees) in an underdeveloped collective mind. It means that employees are subordinated to a system that is pictured as heedless, encouraging them to be careless and uncooperative, whereas groups' power is overestimated. In general, employees keep the false assumption

that consent exist because they prefer silence over genuine interaction. Reducing power distance and investing in business integration might be a good strategy to the organization fills the gap between different stakeholders.

6.2 Success factors and barriers of the ERP implementation

The framework developed in the literature review was used in this research to identify the categories of analysis. The theoretical framework suggests nine categories of analysis, five of which are related to the management of change, three to organizational culture, and one to the geographic dispersion. In addition, we identified 16 actions for change classified into four strategies that have been developed by the company in order to facilitate the process of implementing the new ERP system.

Even though their old ERP system was implemented less than six years earlier, both implementers and end-users understand that the company needed a new ERP system. There was a specific need to redesign processes, integrate the production chain, and include processes that had been left out in the first ERP. The need for change facilitates the proposed change by reducing resistance behaviors, thereby supporting the findings of Van de Ven and Sun (2011). Participants also agree that the organizational structure made it difficult to implement the system. Changes in organizational structure involve an internal rearrangement of the company, requiring a redefinition of responsibilities. In this case study, the highly hierarchical structure of the company constrained the project in the following ways: the decision making was compromised because leaders were not willing to take responsibility for ownerless processes; the redesign of processes that involve many business units was delayed; and the autonomy of end-users to make decisions about processes that they deeply understood was reduced.

Nevertheless, implementers and end-users have different perspectives regarding the effect of previous experience, organizational processes, and the ability to change the approach to system implementation. Implementers have a critical view. Because the implementation of the old ERP system was not successful, implementers believe that the credibility of the current project was questioned, compromising the employees' commitment to the new system. In addition, the processes were not mature enough to be integrated into the new platform. As a consequence, a great amount of time was spent planning and redesigning the processes, delaying the initial schedule. End-users understand that the new ERP was an opportunity to correct the flaws of the old system, and the experience they had with previous project helped them to better contribute to the new one.

As suggested by the literature, organizational culture plays a significant role in organizational change (Jones *et al.*, 2006; Tushman and O'Reilly, 1996). Employees agree that the proposed change is consistent with the organization's mission, vision, and values. End-users believe organizational change is facilitated by the behavior of leadership and the interaction of business units because leaders supported the project and business units did their jobs. To implementers, both factors, behavior of leadership and interaction of business units, constrained the ERP implementation. They point out that leaders did not think systemically, failing to integrate the production chain. Indeed, according to Dezdar and Ainin (2011) and Lines (2005), leaders have a central role in managing change, therefore, causing respondents to show some level of frustration with the leaders' involvement in this project. The presence or absence in decision making can influence the magnitude of employee resistance (Hornstein, 2015).

All employees agree that the company's geographic dispersion was a challenge for this project. Finally, of the 16 management change actions assessed, two were highlighted. Implementers believe that the most effective action was the development of short-term activities for business units. End-users believe the most effective action was investing in

qualified and skilled employees to integrate the project team. This work intends to contribute to existing theory by offering an in-depth analysis of the factors that facilitate or constrain the ERP implementation system. In fact, the end-users' statements indicate that employee engagement has helped to reduce their levels of resistance (Garg and Garg, 2013; Kemp and Low, 2008). In addition, as proposed by Dezdar and Ainin (2011) and Nussbaumer and Merkley (2010), communication channels have also been critical to inform employees about changes, involve employees and reduce resistant behaviors. However, the major contribution of this research is to offer different views about the same project, addressing and overcoming the possible bias perspective that was suggested by Ford *et al.* (2008) and Van de Ven and Sun (2011).

For practitioners, this case study aims to offer the experiences and perceptions that implementers and end-users had about the largest ERP implementation system in Latin America. Therefore, prior to implementing an ERP system in the future, managers, implementers, and end-users can identify the factors that may constrain or facilitate the process. Moreover, they can understand the phenomenon from the perspectives of both the implementers and end-users. In addition, this study seeks to measure the effectiveness of the company's change management actions from the perspective of employees. As a result, companies that are willing to face similar processes can use insights from this work to increase the likelihood of success. For example, they can be aware of the importance of leadership involvement, communication channels, and the team's ability to promote the changes.

6.3 Limitations and future research

Finally, this research also has some limitations. This research could have analyzed the results by region or by production line. Significant cultural differences can be found within the country of Brazil itself (Fregidou-Malama and Hyder, 2015). Our guess is that the perceptions of the ERP implementation can be somehow different, depending on the geographic region or even the position within the hierarchical structure of the company. Nevertheless, the major limitation of this research is the lack of longitudinal data. Future research can investigate if different stakeholders have diverse perceptions of ERP system implementation during each phase of the project. The longitudinal approach might capture possible variances across the process in each group. Finally, case studies provide in-depth insight into the phenomenon studied. Because of this peculiarity, it is not possible to generalize the results. Therefore, using the framework developed in this research, future research can administer a survey to compare employees' resistance to change and their commitment to the outcomes of the ERP system.

Note

1. An ERP implementation can vary widely from one organization to another, which also affects its implications.

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